

**LONGHORN ARMY
AMMUNITION PLANT
KARNACK, TEXAS**

**ADMINISTRATIVE
RECORD**

Volume 5

2020

Bate Stamp Numbers

00956794 – 00958707

Prepared for

**Department of the Army
Longhorn Army Ammunition Plant**

1976–2020

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

VOLUME 5

2020

- A. Title: (cont'd) Report – Final Second Annual Remedial Action Operation Report, LHAAP-35B (37), Chemical Laboratory, Longhorn Army Ammunition Plant, Karnack, Texas, April 2020
Author(s): Department of the Army
Recipient: U.S. Environmental Protection Agency and Texas Commission on Environmental Quality
Date: April 21, 2020
Date Stamp: 00956794 – 00957241
- B. Title: Report – Quarterly Evaluation Report 4th Quarter (October-December) 2019 Groundwater Treatment Plant, Longhorn Army Ammunition Plant, Karnack, Texas, April 2020
Author(s): Bhate Environmental Associates, Inc.
Recipient: U.S. Army Corps of Engineers – Tulsa District
Date: April 21, 2020
Bate Stamp: 00957242 – 00958707



PC KL

Cooler Receipt and Preservation Form

Client AIS Houston Service Request K1907235
 Received: 8/7/19 Opened: 8/7/19 By: BR Unloaded: 8/7/19 By: BR

- Samples were received via? USPS Fed Ex UPS DHL PDX Courier Hand Delivered
- Samples were received in: (circle) Cooler Box Envelope Other NA
- Were custody seals on coolers? NA Y N If yes, how many and where? 1 on each side
 If present, were custody seals intact? Y N If present, were they signed and dated? Y N

Raw Cooler Temp	Corrected Cooler Temp	Raw Temp Blank	Corrected Temp Blank	Corr. Factor	Thermometer ID	Cooler/COC ID	Tracking Number	NA	Filed
-0.2	-0.1	0.3	0.4	+0.1	379	NA	480978365250	NA	

- Packing material: Inserts Baggies Bubble Wrap Gel Packs Wet Ice Dry Ice Sleeves
- Were custody papers properly filled out (ink, signed, etc.)? NA Y N
- Were samples received in good condition (temperature, unbroken)? *Indicate in the table below.* NA Y N
 If applicable, tissue samples were received: Frozen Partially Thawed Thawed
- Were all sample labels complete (i.e analysis, preservation, etc.)? NA Y N
- Did all sample labels and tags agree with custody papers? *Indicate major discrepancies in the table on page 2.* NA Y N
- Were appropriate bottles/containers and volumes received for the tests indicated? NA Y N
- Were the pH-preserved bottles (*see SMO GEN SOP*) received at the appropriate pH? *Indicate in the table below* NA Y N
- Were VOA vials received without headspace? *Indicate in the table below.* NA Y N
- Was C12/Res negative? NA Y N

Sample ID on Bottle	Sample ID on COC	Identified by:

Sample ID	Bottle Count	Bottle Type	Out of Temp	Head-space	Broke	pH	Reagent	Volume added	Reagent Lot Number	Initials	Time

Notes, Discrepancies, & Resolutions: _____



General Chemistry

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577- 7222 Fax (360)636-1 068
www.alsglobal.com

Analytical Report

Client: ALS Environmental - US
Project: HS19080238
Sample Matrix: Ground Water
Analysis Method: SM 5310 C
Prep Method: None

Service Request: K1907235
Date Collected: 08/5/19
Date Received: 08/7/19
Units: mg/L
Basis: NA

Carbon, Total Organic

Sample Name	Lab Code	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
35BWW08.190805	K1907235-001	2.50	0.50	0.20	0.07	1	08/14/19 10:36	
35BWW04.190805	K1907235-002	2.66	0.50	0.20	0.07	1	08/14/19 11:04	
35BWW12.190805	K1907235-003	0.85	0.50	0.20	0.07	1	08/14/19 12:30	
35BWW12.190805-FD	K1907235-004	0.92	0.50	0.20	0.07	1	08/14/19 12:59	
Method Blank	K1907235-MB	ND U	0.50	0.20	0.07	1	08/14/19 12:01	

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: HS19080238
Sample Matrix: Ground Water
Analysis Method: SM 5310 C
Prep Method: None

Service Request: K1907235
Date Collected: 08/05/19
Date Received: 08/07/19

Units: mg/L
Basis: NA

Replicate Sample Summary
Carbon, Total Organic

Sample Name:	Lab Code:	LOQ	LOD	MDL	Sample Result	Duplicate Result	Average	RPD	RPD Limit	Date Analyzed
Batch QC	K1907166-001DUP	0.50	0.20	0.07	ND U	0.39 J	NC	NC	10	08/14/19
35BWW08.190805	K1907235-001DUP	0.50	0.20	0.07	2.50	3.10	2.80	22 *	10	08/14/19
35BWW04.190805	K1907235-002DUP	0.50	0.20	0.07	2.66	2.59	2.63	3	10	08/14/19
35BWW12.190805	K1907235-003DUP	0.50	0.20	0.07	0.85	0.86	0.851	1	10	08/14/19
35BWW12.190805-FD	K1907235-004DUP	0.50	0.20	0.07	0.92	0.92	0.921	<1	10	08/14/19
Batch QC	K1907274-001DUP	0.50	0.20	0.07	0.56	0.51	0.534	9	10	08/14/19
Batch QC	K1907274-002DUP	0.50	0.20	0.07	0.93	0.94	0.937	1	10	08/14/19
Batch QC	K1907274-003DUP	0.50	0.20	0.07	0.94	1.01	0.973	7	10	08/14/19
Batch QC	K1907276-001DUP	0.50	0.20	0.07	2.25	2.18	2.22	3	10	08/14/19
Batch QC	K1907382-001DUP	0.50	0.20	0.07	1.54	1.46	1.50	6	10	08/14/19
Batch QC	K1907383-001DUP	0.50	0.20	0.07	ND U	0.37 J	NC	NC	10	08/14/19
Batch QC	K1907383-002DUP	0.50	0.20	0.07	0.85	0.78	0.813	8	10	08/14/19
Batch QC	K1907383-003DUP	0.50	0.20	0.07	ND U	ND U	NC	NC	10	08/14/19
Batch QC	K1907383-004DUP	0.50	0.20	0.07	ND U	ND U	NC	NC	10	08/14/19

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.

QA/QC Report

Client: ALS Environmental - US
Project: HS19080238
Sample Matrix: Ground Water

Service Request: K1907235
Date Collected: N/A
Date Received: N/A
Date Analyzed: 08/14/19
Date Extracted: NA

Matrix Spike Summary
Carbon, Total Organic

Sample Name: Batch QC
Lab Code: K1907166-001
Analysis Method: SM 5310 C
Prep Method: None

Units: mg/L
Basis: NA

Matrix Spike
K1907166-001MS

<u>Analyte Name</u>	<u>Sample Result</u>	<u>Result</u>	<u>Spike Amount</u>	<u>% Rec</u>	<u>% Rec Limits</u>
Carbon, Total Organic	ND U	26.1	25.0	105	83-117

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: HS19080238
Sample Matrix: Ground Water

Service Request: K1907235
Date Analyzed: 08/14/19
Date Extracted: NA

Lab Control Sample Summary
Carbon, Total Organic

Analysis Method: SM 5310 C
Prep Method: None

Units: mg/L
Basis: NA
Analysis Lot: 647136

Sample Name	Lab Code	Result	Spike Amount	% Rec	% Rec Limits
Lab Control Sample	K1907235-LCS	24.3	25.0	97	83-117

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: HS19080238

Service Request: K1907235

Continuing Calibration Verification (CCV) Summary

Carbon, Total Organic

Analysis Method: SM 5310 C

Units: mg/L

	Analysis		Date	True	Measured	Percent	Acceptance Limits
	Lot	Lab Code	Analyzed	Value	Value	Recovery	
CCV1	647136	KQ1911607-03	08/14/19 04:17	25.0	23.9	96	90-110
CCV2	647136	KQ1911607-04	08/14/19 11:32	25.0	23.9	95	90-110
CCV3	647136	KQ1911607-05	08/14/19 16:15	25.0	23.6	94	90-110
CCV4	647136	KQ1911607-06	08/14/19 20:59	25.0	24.4	97	90-110

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: HS19080238

Service Request: K1907235

Continuing Calibration Blank (CCB) Summary
Carbon, Total Organic

Analysis Method: SM 5310 C

Units: mg/L

	Analysis Lot	Lab Code	Date Analyzed	LOQ	LOD	MDL	Result	Q
CCB1	647136	KQ1911607-07	08/14/19 04:32	0.50	0.20	0.07	ND	U
CCB2	647136	KQ1911607-08	08/14/19 11:47	0.50	0.20	0.07	ND	U
CCB3	647136	KQ1911607-09	08/14/19 16:30	0.50	0.20	0.07	ND	U
CCB4	647136	KQ1911607-10	08/14/19 21:13	0.50	0.20	0.07	ND	U



Raw Data

ALS Environmental—Kelso Laboratory
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General Chemistry

ALS Environmental—Kelso Laboratory
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Work Request # ^{Original} () T1901331, K1907145, 7144, 7284, 7166, 7235, 7274,
 Tier: IV IV IV IV I IV IV
 Date Analyzed: 8/15/19 ^{7276, 7382, 7383}
 Analyst: HLM CES for BCD DOC: 647138
 Analysis: DOC/TOC Run # 647137
 TOC: 647135
647136

**DATA QUALITY REPORT
 INORGANICS**

Explain any "no" responses to questions below, and any corrective actions in the comments section below.

1. Is the method name and number correct and appropriate? (yes/no/NA)
2. Holding times met for all analyses and for all samples? (yes/no/NA)
3. Are calculations correct? (yes/no/NA)
4. Is the reporting basis correct? (Dry Weight) (yes/no/NA)
5. All quality control criteria met? yes/(no)
6. Is the calibration curve correlation coefficient ≥ 0.995 ? (yes/no/NA)
7. MBs, CCVs, CCBs, LCSs, Dups, and Spikes, analyzed at proper frequency? (yes/no/NA)
8. Are ICVs, CCVs, and CCBs all within acceptance limits? (yes/no/NA)
9. Are results for methods blanks all ND? (yes/no/NA)
10. Are all QC samples within acceptance criteria? (LCS % rec, MS/DMS % rec, DUP or MS/DMS RPDs, etc.) yes/(no/NA)
11. Are all exceptions explained? (yes/no/NA)
12. Have all applicable service requests been reviewed? (yes/no/NA)
13. Are all samples labeled correctly? (yes/no/NA)
14. Have all instructions on the service request been followed? (e.g. Special MRLs, QC on a specific sample, Form V) (yes/no/NA)
15. Are detection limits and units reported correctly? (yes/no/NA)
16. Is the unused space on the benchsheet crossed out? (yes/no/NA)
17. Was analysis turned in by the due date? (n-2) (If not record SR#) (yes/no/NA)

COMMENTS:

7235-1 RPD not within acceptance limits
 - foamy non homogeneous sample

Final Approved by: _____

Date: 8/16/19

DQREPORT

Analytical Results Summary

Instrument Name: K-TOC-03

Analyst: BDITZLER

Analysis Lot: 647138 Method/Testcode: SM 5310 C/TOC D

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
KQ1911609-01	Carbon, Dissolved Organic MB (DOC)			Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			8/15/19 06:54:00	N	IV
KQ1911609-02	Carbon, Dissolved Organic LCS (DOC)			Water	24.52 mg/L	10 mL	24.5 mg/L	1	0.07	0.50	98		8/15/19 07:09:00	N	IV
KQ1911609-03	Carbon, Dissolved Organic CCV (DOC)			Water	23.68 mg/L	10 mL	23.7 mg/L	1			95		8/15/19 01:42:00	N	IV
KQ1911609-04	Carbon, Dissolved Organic CCV (DOC)			Water	23.27 mg/L	10 mL	23.3 mg/L	1			93		8/15/19 06:25:00	N	IV
KQ1911609-05	Carbon, Dissolved Organic CCV (DOC)			Water	23.44 mg/L	10 mL	23.4 mg/L	1			94		8/15/19 11:09:00	N	IV
KQ1911609-06	Carbon, Dissolved Organic CCV (DOC)			Water	23.40 mg/L	10 mL	23.4 mg/L	1			94		8/15/19 15:51:00	N	IV
KQ1911609-07	Carbon, Dissolved Organic CCB (DOC)			Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			8/15/19 01:56:00	N	IV
KQ1911609-08	Carbon, Dissolved Organic CCB (DOC)			Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			8/15/19 06:40:00	N	IV
KQ1911609-09	Carbon, Dissolved Organic CCB (DOC)			Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			8/15/19 11:23:00	N	IV
KQ1911609-10	Carbon, Dissolved Organic CCB (DOC)			Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			8/15/19 16:06:00	N	IV
KQ1911609-11	Carbon, Dissolved Organic MS (DOC)		T1901331-021	Water	30.79 mg/L	10 mL	30.8 mg/L	1	0.07	0.50	102		8/15/19 05:55:00	N	IV
KQ1911609-12	Carbon, Dissolved Organic DUP (DOC)		T1901331-021	Water	5.12 mg/L	10 mL	5.12 mg/L	1	0.07	0.50		1	8/15/19 05:27:00	N	IV
KQ1911609-13	Carbon, Dissolved Organic DUP (DOC)		T1901331-022	Water	4.37 mg/L	10 mL	4.37 mg/L	1	0.07	0.50		<1	8/15/19 07:24:00	N	IV
KQ1911609-14	Carbon, Dissolved Organic DUP (DOC)		T1901331-023	Water	5.07 mg/L	10 mL	5.07 mg/L	1	0.07	0.50		<1	8/15/19 07:52:00	N	IV
KQ1911609-15	Carbon, Dissolved Organic DUP (DOC)		T1901331-024	Water	5.07 mg/L	10 mL	5.07 mg/L	1	0.07	0.50		2	8/15/19 08:20:00	N	IV
KQ1911609-16	Carbon, Dissolved Organic DUP (DOC)		T1901331-025	Water	5.19 mg/L	10 mL	5.19 mg/L	1	0.07	0.50		<1	8/15/19 08:48:00	N	IV
KQ1911609-17	Carbon, Dissolved Organic DUP (DOC)		T1901331-026	Water	5.12 mg/L	10 mL	5.12 mg/L	1	0.07	0.50		<1	8/15/19 09:16:00	N	IV
KQ1911609-18	Carbon, Dissolved Organic DUP (DOC)		T1901331-027	Water	5.21 mg/L	10 mL	5.21 mg/L	1	0.07	0.50		<1	8/15/19 09:44:00	N	IV
KQ1911609-19	Carbon, Dissolved Organic DUP (DOC)		T1901331-028	Water	4.97 mg/L	10 mL	4.97 mg/L	1	0.07	0.50		1	8/15/19 10:12:00	N	IV
KQ1911609-20	Carbon, Dissolved Organic DUP (DOC)		T1901331-029	Water	5.14 mg/L	10 mL	5.14 mg/L	1	0.07	0.50		2	8/15/19 10:40:00	N	IV
KQ1911609-21	Carbon, Dissolved Organic DUP (DOC)		T1901331-030	Water	5.11 mg/L	10 mL	5.11 mg/L	1	0.07	0.50		<1	8/15/19 11:38:00	N	IV
KQ1911609-22	Carbon, Dissolved Organic DUP (DOC)		T1901331-031	Water	4.46 mg/L	10 mL	4.46 mg/L	1	0.07	0.50		2	8/15/19 12:06:00	N	IV
KQ1911609-23	Carbon, Dissolved Organic DUP (DOC)		T1901331-032	Water	5.18 mg/L	10 mL	5.18 mg/L	1	0.07	0.50		1	8/15/19 12:34:00	N	IV

indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

CES 8/16/19

Analytical Results Summary

Instrument Name: K-TOC-03

Analyst: BDITZLER

Analysis Lot: 647138 Method/Testcode: SM 5310 C/TOC D

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
KQ1911609-24	Carbon, Dissolved Organic (DOC)	DUP	T1901331-033	Water	5.15 mg/L	10 mL	5.15 mg/L	1	0.07	0.50		1	8/15/19 13:03:00	N	IV
KQ1911609-25	Carbon, Dissolved Organic (DOC)	DUP	T1901331-034	Water	4.27 mg/L	10 mL	4.27 mg/L	1	0.07	0.50		<1	8/15/19 13:31:00	N	IV
KQ1911609-26	Carbon, Dissolved Organic (DOC)	DUP	T1901331-035	Water	2.72 mg/L	10 mL	2.72 mg/L	1	0.07	0.50		4	8/15/19 13:59:00	N	IV
KQ1911609-27	Carbon, Dissolved Organic (DOC)	DUP	T1901331-036	Water	3.87 mg/L	10 mL	3.87 mg/L	1	0.07	0.50		<1	8/15/19 14:27:00	N	IV
T1901331-021	Carbon, Dissolved Organic (DOC)	N/A		Water	5.19 mg/L	10 mL	5.19 mg/L	1	0.07	0.50			8/15/19 05:27:00	N	IV
T1901331-022	Carbon, Dissolved Organic (DOC)	N/A		Water	4.41 mg/L	10 mL	4.41 mg/L	1	0.07	0.50			8/15/19 07:24:00	N	IV
T1901331-023	Carbon, Dissolved Organic (DOC)	N/A		Water	5.07 mg/L	10 mL	5.07 mg/L	1	0.07	0.50			8/15/19 07:52:00	N	IV
T1901331-024	Carbon, Dissolved Organic (DOC)	N/A		Water	5.19 mg/L	10 mL	5.19 mg/L	1	0.07	0.50			8/15/19 08:20:00	N	IV
T1901331-025	Carbon, Dissolved Organic (DOC)	N/A		Water	5.18 mg/L	10 mL	5.18 mg/L	1	0.07	0.50			8/15/19 08:48:00	N	IV
T1901331-026	Carbon, Dissolved Organic (DOC)	N/A		Water	5.12 mg/L	10 mL	5.12 mg/L	1	0.07	0.50			8/15/19 09:16:00	N	IV
T1901331-027	Carbon, Dissolved Organic (DOC)	N/A		Water	5.19 mg/L	10 mL	5.19 mg/L	1	0.07	0.50			8/15/19 09:44:00	N	IV
T1901331-028	Carbon, Dissolved Organic (DOC)	N/A		Water	5.04 mg/L	10 mL	5.04 mg/L	1	0.07	0.50			8/15/19 10:12:00	N	IV
T1901331-029	Carbon, Dissolved Organic (DOC)	N/A		Water	5.22 mg/L	10 mL	5.22 mg/L	1	0.07	0.50			8/15/19 10:40:00	N	IV
T1901331-030	Carbon, Dissolved Organic (DOC)	N/A		Water	5.09 mg/L	10 mL	5.09 mg/L	1	0.07	0.50			8/15/19 11:38:00	N	IV
T1901331-031	Carbon, Dissolved Organic (DOC)	N/A		Water	4.54 mg/L	10 mL	4.54 mg/L	1	0.07	0.50			8/15/19 12:06:00	N	IV
T1901331-032	Carbon, Dissolved Organic (DOC)	N/A		Water	5.12 mg/L	10 mL	5.12 mg/L	1	0.07	0.50			8/15/19 12:34:00	N	IV
T1901331-033	Carbon, Dissolved Organic (DOC)	N/A		Water	5.22 mg/L	10 mL	5.22 mg/L	1	0.07	0.50			8/15/19 13:03:00	N	IV
T1901331-034	Carbon, Dissolved Organic (DOC)	N/A		Water	4.26 mg/L	10 mL	4.26 mg/L	1	0.07	0.50			8/15/19 13:31:00	N	IV
T1901331-035	Carbon, Dissolved Organic (DOC)	N/A		Water	2.83 mg/L	10 mL	2.83 mg/L	1	0.07	0.50			8/15/19 13:59:00	N	IV
T1901331-036	Carbon, Dissolved Organic (DOC)	N/A		Water	3.87 mg/L	10 mL	3.87 mg/L	1	0.07	0.50			8/15/19 14:27:00	N	IV

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indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

Analytical Results Summary

Instrument Name: K-TOC-03

Analyst: BDITZLER

Analysis Lot: 647135 Method/Testcode: 9060A/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
K1907144-001	Carbon, Total Organic (TOC)	N/A		Water	8.59 mg/L	10 mL	8.59 mg/L	1		0.50			8/14/19 02:26:00	N	IV
K1907144-002	Carbon, Total Organic (TOC)	N/A		Water	9.01 mg/L	10 mL	9.01 mg/L	1		0.50			8/14/19 03:22:00	N	IV
K1907145-001	Carbon, Total Organic (TOC)	N/A		Water	12.25 mg/L	10 mL	12.2 mg/L	1		0.50			8/13/19 22:29:00	Y	IV
K1907145-002	Carbon, Total Organic (TOC)	N/A		Water	8.95 mg/L	10 mL	17.9 mg/L	2		1.0			8/14/19 00:35:00	N	IV
K1907145-003	Carbon, Total Organic (TOC)	N/A		Water	6.22 mg/L	10 mL	6.22 mg/L	1		0.50			8/14/19 01:30:00	N	IV
K1907284-001	Carbon, Total Organic (TOC)	N/A		Water	7.67 mg/L	10 mL	7.67 mg/L	1		0.50			8/14/19 04:47:00	N	IV
K1907284-002	Carbon, Total Organic (TOC)	N/A		Water	4.74 mg/L	10 mL	4.74 mg/L	1		0.50			8/14/19 05:43:00	N	IV
K1907284-003	Carbon, Total Organic (TOC)	N/A		Water	4.01 mg/L	10 mL	4.01 mg/L	1		0.50			8/14/19 06:38:00	N	IV
K1907284-004	Carbon, Total Organic (TOC)	N/A		Water	4.64 mg/L	10 mL	37.1 mg/L	8		4.0			8/14/19 07:34:00	N	IV
K1907284-005	Carbon, Total Organic (TOC)	N/A		Water	4.52 mg/L	10 mL	36.2 mg/L	8		4.0			8/14/19 08:30:00	N	IV
KQ1911605-01	Carbon, Total Organic (TOC)	MB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1		0.50			8/13/19 20:22:00	N	IV
KQ1911605-02	Carbon, Total Organic (TOC)	LCS		Water	24.56 mg/L	10 mL	24.6 mg/L	1		0.50	98		8/13/19 21:18:00	N	IV
KQ1911605-03	Carbon, Total Organic (TOC)	CCV		Water	24.08 mg/L	10 mL	24.1 mg/L	1					8/13/19 19:53:00	N	IV
KQ1911605-04	Carbon, Total Organic (TOC)	CCV		Water	23.94 mg/L	10 mL	23.9 mg/L	1					8/14/19 04:17:00	N	IV
KQ1911605-05	Carbon, Total Organic (TOC)	CCV		Water	23.85 mg/L	10 mL	23.9 mg/L	1					8/14/19 11:32:00	N	IV
KQ1911605-06	Carbon, Total Organic (TOC)	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1		0.50			8/13/19 20:08:00	N	IV
KQ1911605-07	Carbon, Total Organic (TOC)	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1		0.50			8/14/19 04:32:00	N	IV
KQ1911605-08	Carbon, Total Organic (TOC)	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1		0.50			8/14/19 11:47:00	N	IV
KQ1911605-26	Carbon, Total Organic (TOC)	MS	K1907145-001	Water	30.72 mg/L	10 mL	61.4 mg/L	2		1.0	98		8/13/19 23:25:00	N	IV
KQ1911605-27	Carbon, Total Organic (TOC)	MS	K1907145-001	Water	30.92 mg/L	10 mL	61.8 mg/L	2		1.0	99		8/13/19 23:25:00	N	IV
KQ1911605-28	Carbon, Total Organic (TOC)	MS	K1907145-001	Water	31.08 mg/L	10 mL	62.2 mg/L	2		1.0	100		8/13/19 23:25:00	N	IV
KQ1911605-29	Carbon, Total Organic (TOC)	MS	K1907145-001	Water	30.96 mg/L	10 mL	61.9 mg/L	2		1.0	99		8/13/19 23:25:00	N	IV
KQ1911605-30	Carbon, Total Organic (TOC)	DUP	K1907145-001	Water	12.24 mg/L	10 mL	12.2 mg/L	1		0.50		<1	8/13/19 22:29:00	N	IV

indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

Analytical Results Summary

Instrument Name: K-TOC-03

Analyst: BDITZLER

Analysis Lot: 647135 Method/Testcode: 9060A/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
KQ1911605-31	Carbon, Total Organic (TOC)	TRP	K1907145-001	Water	12.25 mg/L	10 mL	12.3 mg/L	1		0.50		<1	8/13/19 22:29:00	N	IV
KQ1911605-32	Carbon, Total Organic (TOC)	QUAD	K1907145-001	Water	12.24 mg/L	10 mL	12.2 mg/L	1		0.50		<1	8/13/19 22:29:00	N	IV
KQ1911605-33	Carbon, Total Organic (TOC)	DUP	K1907145-002	Water	9.03 mg/L	10 mL	18.1 mg/L	2		1.0		<1	8/14/19 00:35:00	N	IV
KQ1911605-34	Carbon, Total Organic (TOC)	TRP	K1907145-002	Water	9.02 mg/L	10 mL	18.0 mg/L	2		1.0		<1	8/14/19 00:35:00	N	IV
KQ1911605-35	Carbon, Total Organic (TOC)	QUAD	K1907145-002	Water	9.05 mg/L	10 mL	18.1 mg/L	2		1.0		<1	8/14/19 00:35:00	N	IV
KQ1911605-36	Carbon, Total Organic (TOC)	DUP	K1907145-003	Water	6.09 mg/L	10 mL	6.09 mg/L	1		0.50		2	8/14/19 01:30:00	N	IV
KQ1911605-37	Carbon, Total Organic (TOC)	TRP	K1907145-003	Water	6.09 mg/L	10 mL	6.09 mg/L	1		0.50		1	8/14/19 01:30:00	N	IV
KQ1911605-38	Carbon, Total Organic (TOC)	QUAD	K1907145-003	Water	6.13 mg/L	10 mL	6.13 mg/L	1		0.50		<1	8/14/19 01:30:00	N	IV
KQ1911605-39	Carbon, Total Organic (TOC)	DUP	K1907144-002	Water	8.79 mg/L	10 mL	8.79 mg/L	1		0.50		2	8/14/19 03:22:00	N	IV
KQ1911605-40	Carbon, Total Organic (TOC)	TRP	K1907144-002	Water	8.75 mg/L	10 mL	8.75 mg/L	1		0.50		2	8/14/19 03:22:00	N	IV
KQ1911605-41	Carbon, Total Organic (TOC)	QUAD	K1907144-002	Water	8.79 mg/L	10 mL	8.79 mg/L	1		0.50		1	8/14/19 03:22:00	N	IV
KQ1911605-42	Carbon, Total Organic (TOC)	DUP	K1907284-001	Water	7.59 mg/L	10 mL	7.59 mg/L	1		0.50		<1	8/14/19 04:47:00	N	IV
KQ1911605-43	Carbon, Total Organic (TOC)	TRP	K1907284-001	Water	7.66 mg/L	10 mL	7.66 mg/L	1		0.50		<1	8/14/19 04:47:00	N	IV
KQ1911605-44	Carbon, Total Organic (TOC)	QUAD	K1907284-001	Water	7.62 mg/L	10 mL	7.62 mg/L	1		0.50		<1	8/14/19 04:47:00	N	IV
KQ1911605-45	Carbon, Total Organic (TOC)	DUP	K1907284-002	Water	4.68 mg/L	10 mL	4.68 mg/L	1		0.50		1	8/14/19 05:43:00	N	IV
KQ1911605-46	Carbon, Total Organic (TOC)	TRP	K1907284-002	Water	4.64 mg/L	10 mL	4.64 mg/L	1		0.50		1	8/14/19 05:43:00	N	IV
KQ1911605-47	Carbon, Total Organic (TOC)	QUAD	K1907284-002	Water	4.65 mg/L	10 mL	4.65 mg/L	1		0.50		<1	8/14/19 05:43:00	N	IV
KQ1911605-48	Carbon, Total Organic (TOC)	DUP	K1907284-003	Water	3.99 mg/L	10 mL	3.99 mg/L	1		0.50		<1	8/14/19 06:38:00	N	IV
KQ1911605-49	Carbon, Total Organic (TOC)	TRP	K1907284-003	Water	3.96 mg/L	10 mL	3.96 mg/L	1		0.50		<1	8/14/19 06:38:00	N	IV
KQ1911605-50	Carbon, Total Organic (TOC)	QUAD	K1907284-003	Water	4.02 mg/L	10 mL	4.02 mg/L	1		0.50		<1	8/14/19 06:38:00	N	IV
KQ1911605-51	Carbon, Total Organic (TOC)	DUP	K1907284-004	Water	4.62 mg/L	10 mL	37.0 mg/L	8		4.0		<1	8/14/19 07:34:00	N	IV
KQ1911605-52	Carbon, Total Organic (TOC)	TRP	K1907284-004	Water	4.64 mg/L	10 mL	37.1 mg/L	8		4.0		<1	8/14/19 07:34:00	N	IV
KQ1911605-53	Carbon, Total Organic (TOC)	QUAD	K1907284-004	Water	4.69 mg/L	10 mL	37.5 mg/L	8		4.0		<1	8/14/19 07:34:00	N	IV

indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

Analytical Results Summary

Instrument Name: K-TOC-03

Analyst: BDITZLER

Analysis Lot: 647135 Method/Testcode: 9060A/TOC T

<u>Lab Code</u>	<u>Target Analytes</u>	<u>QC</u>	<u>Parent Sample</u>	<u>Matrix</u>	<u>Raw Result</u>	<u>Sample Amt.</u>	<u>Final Result</u>	<u>Dil</u>	<u>MDL</u>	<u>PQL</u>	<u>% Rec</u>	<u>% RSD</u>	<u>Date Analyzed</u>	<u>QC?</u>	<u>Tier</u>
KQ1911605-54	Carbon, Total Organic (TOC)	DUP	K1907284-005	Water	4.55 mg/L	10 mL	36.4 mg/L	8		4.0		<1	8/14/19 08:30:00	N	IV
KQ1911605-55	Carbon, Total Organic (TOC)	TRP	K1907284-005	Water	4.53 mg/L	10 mL	36.3 mg/L	8		4.0		<1	8/14/19 08:30:00	N	IV
KQ1911605-56	Carbon, Total Organic (TOC)	QUAD	K1907284-005	Water	4.56 mg/L	10 mL	36.5 mg/L	8		4.0		<1	8/14/19 08:30:00	N	IV
KQ1911605-57	Carbon, Total Organic (TOC)	DUP	K1907144-001	Water	8.58 mg/L	10 mL	8.58 mg/L	1		0.50		<1	8/14/19 02:26:00	N	IV
KQ1911605-58	Carbon, Total Organic (TOC)	TRP	K1907144-001	Water	8.54 mg/L	10 mL	8.54 mg/L	1		0.50		<1	8/14/19 02:26:00	N	IV
KQ1911605-59	Carbon, Total Organic (TOC)	QUAD	K1907144-001	Water	8.50 mg/L	10 mL	8.50 mg/L	1		0.50		<1	8/14/19 02:26:00	N	IV

indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

Analytical Results Summary

Instrument Name: K-TOC-03

Analyst: BDITZLER

Analysis Lot: 647136

Method/Testcode: SM 5310 C/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
K1907166-001	Carbon, Total Organic	N/A		Drinking Water	0.41 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			8/14/19 09:25:00	N	I
K1907235-001	Carbon, Total Organic	N/A		Ground Water	2.50 mg/L	10 mL	2.50 mg/L	1	0.07	0.50			8/14/19 10:36:00	N	IV
K1907235-002	Carbon, Total Organic	N/A		Ground Water	2.66 mg/L	10 mL	2.66 mg/L	1	0.07	0.50			8/14/19 11:04:00	N	IV
K1907235-003	Carbon, Total Organic	N/A		Ground Water	0.85 mg/L	10 mL	0.85 mg/L	1	0.07	0.50			8/14/19 12:30:00	N	IV
K1907235-004	Carbon, Total Organic	N/A		Ground Water	0.92 mg/L	10 mL	0.92 mg/L	1	0.07	0.50			8/14/19 12:59:00	N	IV
K1907274-001	Carbon, Total Organic	N/A		Ground Water	0.56 mg/L	10 mL	0.56 mg/L	1	0.07	0.50			8/14/19 13:27:00	N	IV
K1907274-002	Carbon, Total Organic	N/A		Ground Water	0.93 mg/L	10 mL	0.93 mg/L	1	0.07	0.50			8/14/19 13:55:00	N	IV
K1907274-003	Carbon, Total Organic	N/A		Ground Water	0.94 mg/L	10 mL	0.94 mg/L	1	0.07	0.50			8/14/19 14:23:00	N	IV
K1907276-001	Carbon, Total Organic	N/A		Water	2.25 mg/L	10 mL	2.25 mg/L	1	0.07	0.50			8/14/19 14:51:00	N	IV
K1907382-001	Carbon, Total Organic	N/A		Water	1.54 mg/L	10 mL	1.54 mg/L	1	0.07	0.50			8/14/19 15:19:00	N	II
K1907383-001	Carbon, Total Organic	N/A		Water	0.29 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			8/14/19 15:47:00	N	II
K1907383-002	Carbon, Total Organic	N/A		Water	0.85 mg/L	10 mL	0.85 mg/L	1	0.07	0.50			8/14/19 16:45:00	N	II
K1907383-003	Carbon, Total Organic	N/A		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			8/14/19 17:13:00	N	II
K1907383-004	Carbon, Total Organic	N/A		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			8/14/19 17:41:00	N	II
KQ1911607-01	Carbon, Total Organic	MB		Drinking Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			8/14/19 12:01:00	N	I
KQ1911607-02	Carbon, Total Organic	LCS		Drinking Water	24.30 mg/L	10 mL	24.3 mg/L	1	0.07	0.50	97		8/14/19 12:16:00	N	I
KQ1911607-03	Carbon, Total Organic	CCV		Drinking Water	23.94 mg/L	10 mL	23.9 mg/L	1					8/14/19 04:17:00	N	I
KQ1911607-04	Carbon, Total Organic	CCV		Drinking Water	23.85 mg/L	10 mL	23.9 mg/L	1					8/14/19 11:32:00	N	I
KQ1911607-05	Carbon, Total Organic	CCV		Drinking Water	23.62 mg/L	10 mL	23.6 mg/L	1					8/14/19 16:15:00	N	I
KQ1911607-06	Carbon, Total Organic	CCV		Drinking Water	24.36 mg/L	10 mL	24.4 mg/L	1					8/14/19 20:59:00	N	I
KQ1911607-07	Carbon, Total Organic	CCB		Drinking Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			8/14/19 04:32:00	N	I
KQ1911607-08	Carbon, Total Organic	CCB		Drinking Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			8/14/19 11:47:00	N	I
KQ1911607-09	Carbon, Total Organic	CCB		Drinking Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			8/14/19 16:30:00	N	I
KQ1911607-10	Carbon, Total Organic	CCB		Drinking Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			8/14/19 21:13:00	N	I
KQ1911607-11	Carbon, Total Organic	DUP	K1907166-001	Drinking Water	0.39 mg/L	10 mL	0.39 mg/L J	1	0.07	0.50		NC	8/14/19 09:25:00	N	I
KQ1911607-12	Carbon, Total Organic	MS	K1907166-001	Drinking Water	26.15 mg/L	10 mL	26.1 mg/L	1	0.07	0.50	105		8/14/19 09:53:00	N	I
KQ1911607-13	Carbon, Total Organic	DUP	K1907235-001	Ground Water	3.10 mg/L	10 mL	3.10 mg/L	1	0.07	0.50		22*	8/14/19 10:36:00	N	IV

indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

Analytical Results Summary

Instrument Name: K-TOC-03

Analyst: BDITZLER

Analysis Lot: 647136 Method/Testcode: SM 5310 C/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
KQ1911607-14	Carbon, Total Organic	DUP	K1907235-002	Ground Water	2.59 mg/L	10 mL	2.59 mg/L	1	0.07	0.50		3	8/14/19 11:04:00	N	IV
KQ1911607-15	Carbon, Total Organic	DUP	K1907235-003	Ground Water	0.86 mg/L	10 mL	0.86 mg/L	1	0.07	0.50		1	8/14/19 12:30:00	N	IV
KQ1911607-16	Carbon, Total Organic	DUP	K1907235-004	Ground Water	0.92 mg/L	10 mL	0.92 mg/L	1	0.07	0.50		<1	8/14/19 12:59:00	N	IV
KQ1911607-17	Carbon, Total Organic	DUP	K1907274-001	Ground Water	0.51 mg/L	10 mL	0.51 mg/L	1	0.07	0.50		9	8/14/19 13:27:00	N	IV
KQ1911607-18	Carbon, Total Organic	DUP	K1907274-002	Ground Water	0.94 mg/L	10 mL	0.94 mg/L	1	0.07	0.50		1	8/14/19 13:55:00	N	IV
KQ1911607-19	Carbon, Total Organic	DUP	K1907274-003	Ground Water	1.01 mg/L	10 mL	1.01 mg/L	1	0.07	0.50		7	8/14/19 14:23:00	N	IV
KQ1911607-20	Carbon, Total Organic	DUP	K1907276-001	Water	2.18 mg/L	10 mL	2.18 mg/L	1	0.07	0.50		3	8/14/19 14:51:00	N	IV
KQ1911607-21	Carbon, Total Organic	DUP	K1907382-001	Water	1.46 mg/L	10 mL	1.46 mg/L	1	0.07	0.50		6	8/14/19 15:19:00	N	II
KQ1911607-22	Carbon, Total Organic	DUP	K1907383-001	Water	0.37 mg/L	10 mL	0.37 mg/L	J 1	0.07	0.50		NC	8/14/19 15:47:00	N	II
KQ1911607-23	Carbon, Total Organic	DUP	K1907383-002	Water	0.78 mg/L	10 mL	0.78 mg/L	1	0.07	0.50		8	8/14/19 16:45:00	N	II
KQ1911607-24	Carbon, Total Organic	DUP	K1907383-003	Water	0.00 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50		NC	8/14/19 17:13:00	N	II
KQ1911607-25	Carbon, Total Organic	DUP	K1907383-004	Water	0.06 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50		NC	8/14/19 17:41:00	N	II

indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

Analytical Results Summary

Instrument Name: K-TOC-03

Analyst: BDITZLER

Analysis Lot: 647137 Method/Testcode: SM 5310 C/TOC D

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
KQ1911608-01	Carbon, Dissolved Organic (DOC)	MB		Water	0.00 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50			8/14/19 21:28:00	N	IV
KQ1911608-02	Carbon, Dissolved Organic (DOC)	LCS		Water	25.02 mg/L	10 mL	25.0 mg/L	1	0.07	0.50	100		8/15/19 21:43:00	N	IV
KQ1911608-03	Carbon, Dissolved Organic (DOC)	CCV		Water	23.62 mg/L	10 mL	23.6 mg/L	1					8/14/19 16:15:00	N	IV
KQ1911608-04	Carbon, Dissolved Organic (DOC)	CCV		Water	24.36 mg/L	10 mL	24.4 mg/L	1					8/14/19 20:59:00	N	IV
KQ1911608-05	Carbon, Dissolved Organic (DOC)	CCV		Water	23.68 mg/L	10 mL	23.7 mg/L	1					8/15/19 01:42:00	N	IV
KQ1911608-06	Carbon, Dissolved Organic (DOC)	CCV		Water	23.27 mg/L	10 mL	23.3 mg/L	1					8/15/19 06:25:00	N	IV
KQ1911608-07	Carbon, Dissolved Organic (DOC)	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50			8/14/19 16:30:00	N	IV
KQ1911608-08	Carbon, Dissolved Organic (DOC)	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50			8/14/19 21:13:00	N	IV
KQ1911608-09	Carbon, Dissolved Organic (DOC)	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50			8/15/19 01:56:00	N	IV
KQ1911608-10	Carbon, Dissolved Organic (DOC)	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50			8/15/19 06:40:00	N	IV
KQ1911608-11	Carbon, Dissolved Organic (DOC)	MS	T1901331-001	Water	21.75 mg/L	10 mL	43.5 mg/L	2	0.2	1.0	84		8/14/19 18:37:00	N	IV
KQ1911608-12	Carbon, Dissolved Organic (DOC)	DUP	T1901331-001	Water	1.65 mg/L	10 mL	1.65 mg/L	1	0.07	0.50		2	8/14/19 18:09:00	N	IV
KQ1911608-13	Carbon, Dissolved Organic (DOC)	DUP	T1901331-002	Water	2.13 mg/L	10 mL	2.13 mg/L	1	0.07	0.50		2	8/14/19 19:06:00	N	IV
KQ1911608-14	Carbon, Dissolved Organic (DOC)	DUP	T1901331-003	Water	2.59 mg/L	10 mL	2.59 mg/L	1	0.07	0.50		5	8/14/19 19:34:00	N	IV
KQ1911608-15	Carbon, Dissolved Organic (DOC)	DUP	T1901331-004	Water	0.54 mg/L	10 mL	0.54 mg/L	1	0.07	0.50		6	8/14/19 20:02:00	N	IV
KQ1911608-16	Carbon, Dissolved Organic (DOC)	DUP	T1901331-005	Water	0.57 mg/L	10 mL	0.57 mg/L	1	0.07	0.50		8	8/14/19 20:30:00	N	IV
KQ1911608-17	Carbon, Dissolved Organic (DOC)	DUP	T1901331-006	Water	0.52 mg/L	10 mL	0.52 mg/L	1	0.07	0.50		9	8/14/19 21:57:00	N	IV
KQ1911608-18	Carbon, Dissolved Organic (DOC)	DUP	T1901331-007	Water	2.89 mg/L	10 mL	2.89 mg/L	1	0.07	0.50		1	8/14/19 22:25:00	N	IV
KQ1911608-19	Carbon, Dissolved Organic (DOC)	DUP	T1901331-008	Water	3.28 mg/L	10 mL	3.28 mg/L	1	0.07	0.50		<1	8/14/19 22:53:00	N	IV
KQ1911608-20	Carbon, Dissolved Organic (DOC)	DUP	T1901331-009	Water	3.82 mg/L	10 mL	3.82 mg/L	1	0.07	0.50		<1	8/14/19 23:21:00	N	IV
KQ1911608-21	Carbon, Dissolved Organic (DOC)	DUP	T1901331-010	Water	0.51 mg/L	10 mL	0.51 mg/L	1	0.07	0.50		NC	8/14/19 23:49:00	N	IV
KQ1911608-22	Carbon, Dissolved Organic (DOC)	DUP	T1901331-011	Water	0.66 mg/L	10 mL	0.66 mg/L	1	0.07	0.50		4	8/15/19 00:17:00	N	IV
KQ1911608-23	Carbon, Dissolved Organic (DOC)	DUP	T1901331-012	Water	1.14 mg/L	10 mL	1.14 mg/L	1	0.07	0.50		8	8/15/19 00:45:00	N	IV

indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

Analytical Results Summary

Instrument Name: K-TOC-03

Analyst: BDITZLER

Analysis Lot: 647137 Method/Testcode: SM 5310 C/TOC D

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
KQ1911608-24	Carbon, Dissolved Organic (DOC)	DUP	T1901331-013	Water	4.49 mg/L	10 mL	4.49 mg/L	1	0.07	0.50		<1	8/15/19 01:14:00	N	IV
KQ1911608-25	Carbon, Dissolved Organic (DOC)	DUP	T1901331-014	Water	4.67 mg/L	10 mL	4.67 mg/L	1	0.07	0.50		<1	8/15/19 02:11:00	N	IV
KQ1911608-26	Carbon, Dissolved Organic (DOC)	DUP	T1901331-015	Water	4.96 mg/L	10 mL	4.96 mg/L	1	0.07	0.50		<1	8/15/19 02:39:00	N	IV
KQ1911608-27	Carbon, Dissolved Organic (DOC)	DUP	T1901331-016	Water	1.60 mg/L	10 mL	1.60 mg/L	1	0.07	0.50		9	8/15/19 03:07:00	N	IV
KQ1911608-28	Carbon, Dissolved Organic (DOC)	DUP	T1901331-017	Water	1.66 mg/L	10 mL	1.66 mg/L	1	0.07	0.50		6	8/15/19 03:35:00	N	IV
KQ1911608-29	Carbon, Dissolved Organic (DOC)	DUP	T1901331-018	Water	3.89 mg/L	10 mL	3.89 mg/L	1	0.07	0.50		<1	8/15/19 04:03:00	N	IV
KQ1911608-30	Carbon, Dissolved Organic (DOC)	DUP	T1901331-019	Water	5.15 mg/L	10 mL	5.15 mg/L	1	0.07	0.50		<1	8/15/19 04:31:00	N	IV
KQ1911608-31	Carbon, Dissolved Organic (DOC)	DUP	T1901331-020	Water	5.17 mg/L	10 mL	5.17 mg/L	1	0.07	0.50		<1	8/15/19 04:59:00	N	IV
T1901331-001	Carbon, Dissolved Organic (DOC)	N/A		Water	1.62 mg/L	10 mL	1.62 mg/L	1	0.07	0.50			8/14/19 18:09:00	N	IV
T1901331-002	Carbon, Dissolved Organic (DOC)	N/A		Water	2.18 mg/L	10 mL	2.18 mg/L	1	0.07	0.50			8/14/19 19:06:00	N	IV
T1901331-003	Carbon, Dissolved Organic (DOC)	N/A		Water	2.47 mg/L	10 mL	2.47 mg/L	1	0.07	0.50			8/14/19 19:34:00	N	IV
T1901331-004	Carbon, Dissolved Organic (DOC)	N/A		Water	0.51 mg/L	10 mL	0.51 mg/L	1	0.07	0.50			8/14/19 20:02:00	N	IV
T1901331-005	Carbon, Dissolved Organic (DOC)	N/A		Water	0.53 mg/L	10 mL	0.53 mg/L	1	0.07	0.50			8/14/19 20:30:00	N	IV
T1901331-006	Carbon, Dissolved Organic (DOC)	N/A		Water	0.57 mg/L	10 mL	0.57 mg/L	1	0.07	0.50			8/14/19 21:57:00	N	IV
T1901331-007	Carbon, Dissolved Organic (DOC)	N/A		Water	2.86 mg/L	10 mL	2.86 mg/L	1	0.07	0.50			8/14/19 22:25:00	N	IV
T1901331-008	Carbon, Dissolved Organic (DOC)	N/A		Water	3.29 mg/L	10 mL	3.29 mg/L	1	0.07	0.50			8/14/19 22:53:00	N	IV
T1901331-009	Carbon, Dissolved Organic (DOC)	N/A		Water	3.81 mg/L	10 mL	3.81 mg/L	1	0.07	0.50			8/14/19 23:21:00	N	IV
T1901331-010	Carbon, Dissolved Organic (DOC)	N/A		Water	0.50 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50			8/14/19 23:49:00	N	IV
T1901331-011	Carbon, Dissolved Organic (DOC)	N/A		Water	0.64 mg/L	10 mL	0.64 mg/L	1	0.07	0.50			8/15/19 00:17:00	N	IV
T1901331-012	Carbon, Dissolved Organic (DOC)	N/A		Water	1.24 mg/L	10 mL	1.24 mg/L	1	0.07	0.50			8/15/19 00:45:00	N	IV
T1901331-013	Carbon, Dissolved Organic (DOC)	N/A		Water	4.51 mg/L	10 mL	4.51 mg/L	1	0.07	0.50			8/15/19 01:14:00	N	IV
T1901331-014	Carbon, Dissolved Organic (DOC)	N/A		Water	4.70 mg/L	10 mL	4.70 mg/L	1	0.07	0.50			8/15/19 02:11:00	N	IV
T1901331-015	Carbon, Dissolved Organic (DOC)	N/A		Water	4.99 mg/L	10 mL	4.99 mg/L	1	0.07	0.50			8/15/19 02:39:00	N	IV

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indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

Analytical Results Summary

Instrument Name: K-TOC-03

Analyst: BDITZLER

Analysis Lot: 647137 Method/Testcode: SM 5310 C/TOC D

<u>Lab Code</u>	<u>Target Analytes</u>	<u>QC</u>	<u>Parent Sample</u>	<u>Matrix</u>	<u>Raw Result</u>	<u>Sample Amt.</u>	<u>Final Result</u>	<u>Dil</u>	<u>MDL</u>	<u>PQL</u>	<u>% Rec</u>	<u>% RSD</u>	<u>Date Analyzed</u>	<u>QC?</u>	<u>Tier</u>
T1901331-016	Carbon, Dissolved Organic (DOC)	N/A		Water	1.76 mg/L	10 mL	1.76 mg/L	1	0.07	0.50			8/15/19 03:07:00	N	IV
T1901331-017	Carbon, Dissolved Organic (DOC)	N/A		Water	1.76 mg/L	10 mL	1.76 mg/L	1	0.07	0.50			8/15/19 03:35:00	N	IV
T1901331-018	Carbon, Dissolved Organic (DOC)	N/A		Water	3.91 mg/L	10 mL	3.91 mg/L	1	0.07	0.50			8/15/19 04:03:00	N	IV
T1901331-019	Carbon, Dissolved Organic (DOC)	N/A		Water	5.15 mg/L	10 mL	5.15 mg/L	1	0.07	0.50			8/15/19 04:31:00	N	IV
T1901331-020	Carbon, Dissolved Organic (DOC)	N/A		Water	5.21 mg/L	10 mL	5.21 mg/L	1	0.07	0.50			8/15/19 04:59:00	N	IV

indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

TOC: 647135

647136

DOC: 647137

647138

Schedule: 08132019

Version: 6

Instrument: Fusion1

Last Saved by: Fusion1 (Fusion1)

Last Saved on: 2019/08/13 19:09 - Tuesday

Position	Sample Type	Sample ID	Method ID (Calibration ID)	Reps	Use	State
(Clean)	Clean	Clean		1	True	Ready
(Clean)	Clean	Clean		1	True	Ready
(Clean)	Clean	Clean		1	True	Ready
(Blank)	Blank	Reagent/Acid Blank		1	True	Ready
D	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
1	Sample	MB1	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
C	Check Standard	[TOC] LCS [24.0 ppm]	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
2	Sample	ICS	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
3	Sample	K1907145-001.07	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
4	Sample	K1907145-001.07 ms 2x	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
5	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
6	Sample	K1907145-002.02 2x	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
7	Sample	K1907145-003.02	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
8	Sample	K1907144-001.02	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
9	Sample	K1907144-002.02	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
10	Sample	K1907284-001.02	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
11	Sample	K1907284-002.02	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
12	Sample	K1907284-003.02	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
13	Sample	K1907284-004.02 8x	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
14	Sample	K1907284-005.02 8x	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
15	Sample	K1907166-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
16	Sample	K1907166-001.01 ms	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
17	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
18	Sample	K1907235-001.02	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
19	Sample	K1907235-002.02	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
20	Sample	MB2	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
C	Check Standard	[TOC] LCS [24.0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
21	Sample	K1907235-003.02	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
22	Sample	K1907235-004.02	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
23	Sample	K1907274-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
24	Sample	K1907274-002.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
25	Sample	K1907274-003.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
26	Sample	K1907276-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
27	Sample	K1907382-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
28	Sample	K1907383-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
29	Sample	K1907383-002.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
30	Sample	K1907383-003.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
31	Sample	K1907383-004.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
32	Sample	T1901331-001.05 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
33	Sample	T1901331-001.05 ms doc 2x	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
34	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
35	Sample	T1901331-002.05 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
36	Sample	T1901331-003.05 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
37	Sample	T1901331-004.05 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
38	Sample	T1901331-005.05 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready

Printed on: August 15, 2019 17:44:01

Page 1

Schedule: 08132019

Position	Sample Type	Sample ID	Method ID (Calibration ID)	Reps	Use	State
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
39	Sample	MB3	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
C	Check Standard	[TOC] LCS [25.0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
40	Sample	T1901331-006.05 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
41	Sample	T1901331-007.05 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
42	Sample	T1901331-008.05 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
43	Sample	T1901331-009.05 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
44	Sample	T1901331-010.05 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
45	Sample	T1901331-011.05 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
46	Sample	T1901331-012.05 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
47	Sample	T1901331-013.05 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
48	Sample	T1901331-014.05 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
49	Sample	T1901331-015.05 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
50	Sample	T1901331-016.05 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
51	Sample	T1901331-017.05 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
52	Sample	T1901331-018.05 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
53	Sample	T1901331-019.05 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
54	Sample	T1901331-020.05 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
55	Sample	T1901331-021.05 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
56	Sample	T1901331-021.05 ms doc	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
57	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
58	Sample	MB4	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
C	Check Standard	[TOC] LCS [25.0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
59	Sample	T1901331-022.05 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
60	Sample	T1901331-023.05 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
61	Sample	T1901331-024.05 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
62	Sample	T1901331-025.05 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
63	Sample	T1901331-026.05 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
64	Sample	T1901331-027.05 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
65	Sample	T1901331-028.05 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
66	Sample	T1901331-029.05 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
67	Sample	T1901331-030.05 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
68	Sample	T1901331-031.05 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
69	Sample	T1901331-032.05 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
70	Sample	T1901331-033.05 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
71	Sample	T1901331-034.05 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
72	Sample	T1901331-035.05 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
73	Sample	T1901331-036.05 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
74	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
75	Sample	Lot check 190516	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
					False	

StarLIMS Run: 647138, 647137, 647135, 647136
 Analysis: DOC/TOC
 Method: SM 5310 C, 9060A

CCV: 11-GEN-05-79K 50 ppm LCS: 11-GEN-05-79J 25.0 ppm

ICAL Date: 3/6/19

ICAL ID: 11-GEN-05-76H

ICS ID: 11-GEN-05-74A

ICS TV: 25.0 ppm ICS % R = 2

Spike ID: 11-GEN-05-77J 0.05 ml of 5000 ppm stock ---> 10.0 ml = 25.0 ppm x dilution factor

Sodium Persulfate: 11-GEN-05-79O

21 % H₃PO₄: 11-GEN-05-80A

Equipment ID: K-TOC-03

PIPETTE ID: 124276B, 129001F, N11314F, Marge

FILTER ID: N/A

Analyzed By: <u>CES</u>	Date Analyzed: <u>8/15/19</u>
Reviewed By: <u>[Signature]</u>	Date Reviewed: <u>8/16/19</u>

Fusion Report - 08132019

Tuesday, August 13, 2019 05:58 PM

(View - Repts, Unused Repts, Meta-Data, Signature, History)
Printed on 2019/08/15 17:44 - Thursday

Report Summary Information

Company Location: Gen Chem Lab
 Schedule Name: 08132019
 Instrument Name: Fusion1
 Report Version: 1 of 1
 Report Creation by Operators (schedule version): Fusion1 (Fusion1) (v1)
 Fusion1 (Fusion1) (v2)
 Fusion1 (Fusion1) (v3)
 Fusion1 (Fusion1) (v5)
 Fusion1 (Fusion1) (v6)
 Comment:

Engine 1.1.5.1
 Version:
 Firmware 1.2.0696
 Version:
 Connection: RS232 COM1

Report Results

Sample Type: Clean							From Schedule Version 1
Pos	Analysis Type	Sample ID			Start Time		
◆ (clean)		Clean			2019/08/13 17:58		
Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time	
1	IC Clean	12.23	17.62	5.39	49.52	05:19	
2	TC Clean	14.45	17.83	3.38	50.18	04:03	
3	TC Clean	4.21	7.69	3.47	50.18	03:48	
4	TC Clean	3.03	6.44	3.41	50.13	03:46	

Sample Type: Clean							From Schedule Version 2
Pos	Analysis Type	Sample ID			Start Time		
◆ (clean)		Clean			2019/08/13 18:20		
Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time	
1	IC Clean	11.15	14.57	3.43	49.49	05:12	
2	TC Clean	9.19	12.58	3.39	50.12	04:02	
3	TC Clean	5.21	8.67	3.47	50.21	03:46	

4	TC Clean	3.70	7.06	3.36	50.26	03:48
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Sample Type: Clean

From Schedule Version 3

Pos	Analysis Type	Sample ID	Start Time
◊ (clean)		Clean	2019/08/13 18:42

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	10.81	14.16	3.36	49.71	05:07
2	TC Clean	6.25	9.60	3.35	50.18	04:04
3	TC Clean	3.61	7.16	3.55	50.23	03:45
4	TC Clean	2.76	6.13	3.38	50.17	03:46

Sample Type: Blank (Creating v1284)

From Schedule Version 5

Pos	Analysis Type	Sample ID	Start Time
◊ (blank)		Reagent/Acid Blank	2019/08/13 19:05

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	10.85	14.22	3.37	49.55	05:12
2	TC Clean	5.97	9.31	3.34	50.19	04:04
3	TC Clean	3.05	6.43	3.38	50.20	03:47
4	TC Clean	2.42	5.81	3.38	50.12	03:52
5	Reagent Blank	3.95	7.18	3.23	50.18	05:04
6	Acid Blank	1.44	4.66	3.23	49.61	05:24

Sample Type: Sample

From Schedule Version 6

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◊ D	TOC	RB	0.3158 ppm	0.0000 ppm	0.0000%	2019/08/13 19:38

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.3158	3.1579	10.92	14.23	3.30	50.08	10:31

Dilution

1:10

Blank Contribution(TC) 8.7794 (IC)
(v1284)**Method**CAS_salt_010711
(v4)**Calibration**CAS_salt_010711
(v30)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 6

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
♦ B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	24.0809 ppm (PASS)	0.0000 ppm	0%	2019/08/13 19:53

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.0809	240.8087	172.92	176.23	3.31	50.13	10:29

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	50 ppmC

Sample Type: Check Standard --> CCB From Schedule Version 6

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
♦ D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/08/13 20:08

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	7.08	10.50	3.42	50.11	10:30

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	0 ppmC

Sample Type: Sample From Schedule Version 6

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
♦ 1	TOC	MB1	0.0000 ppm	0.0000 ppm	0.0000%	2019/08/13 20:22

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.18	9.53	3.35	50.12	10:28
2	TOC	0.0000	0.0000	6.42	9.79	3.37	50.10	10:26
3	TOC	0.0000	0.0000	5.72	9.09	3.37	50.12	10:27
4	TOC	0.0000	0.0000	5.94	9.00	3.06	50.11	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7794 (IC) (v1284)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> LCS From Schedule Version 6

Concentration	Min / Max

Pos	BAT	(ppm)	Dil	Sample ID	(% dev)	Result	Std. Dev.	RSD	Start Time	
◆	C	TOC	25.0000	1:1	[TOC] LCS [24.0 ppm]	0 / infinity (NA / NA)	24.5556 ppm (PASS)	0.0898 ppm	0.37%	2019/08/13 21:18

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	24.5038	245.0382	175.79	179.06	3.26	50.10	10:28
C	TOC	25.0 ppm	2	24.5673	245.6732	176.22	179.39	3.16	50.08	10:26
C	TOC	25.0 ppm	3	24.4744	244.7436	175.59	178.80	3.20	50.09	10:27
C	TOC	25.0 ppm	4	24.6771	246.7707	176.97	180.27	3.31	50.08	10:25

Completion State	Success Action	Method	Calibration	STD Conc - Pos C
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	25 ppmC

Sample Type: Sample From Schedule Version 6

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time	
◆	2	TOC	ICS	0.4496 ppm	0.0000 ppm	0.0000%	2019/08/13 22:14

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.4496	4.4956	11.83	15.28	3.45	50.10	10:32

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7794 (IC) (v1284)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time	
◆	3	TOC	K1907145-001.07	12.2454 ppm	0.0079 ppm	0.0600%	2019/08/13 22:29

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	12.2497	122.4975	91.93	95.25	3.32	50.10	10:27
2	TOC	12.2437	122.4371	91.89	95.17	3.28	50.12	10:24
3	TOC	12.2531	122.5314	91.95	95.25	3.30	50.14	10:26
4	TOC	12.2352	122.3516	91.83	95.13	3.30	50.11	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7794 (IC) (v1284)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time	
◆	4	TOC	K1907145-001.07 ms 2x	30.9202 ppm	0.1526 ppm	0.4900%	2019/08/13 23:25

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	30.9616	309.6161	218.94	222.21	3.27	50.14	10:29
2	TOC	31.0842	310.8418	219.78	223.09	3.32	50.14	10:25
3	TOC	30.9179	309.1785	218.65	222.05	3.40	50.14	10:30

4	TOC	30.7171	307.1706	217.28	220.53	3.25	50.17	10:27
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Dilution 1:10
Blank Contribution (TC) 8.7794 (IC) (v1284)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
5	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2019/08/14 00:20

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.64	9.99	3.34	50.19	10:34

Dilution 1:10
Blank Contribution (TC) 8.7794 (IC) (v1284)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
6	TOC	K1907145-002.02 2x	9.0108 ppm	0.0411 ppm	0.4600%	2019/08/14 00:35

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	8.9514	89.5140	69.54	72.80	3.26	50.19	10:28
2	TOC	9.0262	90.2624	70.05	73.32	3.27	50.22	10:25
3	TOC	9.0200	90.2005	70.01	73.47	3.46	50.22	10:26
4	TOC	9.0455	90.4554	70.18	73.62	3.44	50.25	10:30

Dilution 1:10
Blank Contribution (TC) 8.7794 (IC) (v1284)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
7	TOC	K1907145-003.02	6.1331 ppm	0.0584 ppm	0.9500%	2019/08/14 01:30

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	6.2177	62.1773	50.98	54.26	3.28	50.27	10:26
2	TOC	6.0944	60.9442	50.15	53.47	3.32	50.26	10:28
3	TOC	6.0941	60.9413	50.15	53.52	3.38	50.26	10:23
4	TOC	6.1261	61.2609	50.36	53.71	3.35	50.28	10:29

Dilution 1:10
Blank Contribution (TC) 8.7794 (IC) (v1284)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
8	TOC	K1907144-001.02	8.5535 ppm	0.0398 ppm	0.4700%	2019/08/14 02:26

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	8.5881	85.8811	67.08	70.51	3.43	50.28	10:24
2	TOC	8.5803	85.8030	67.02	70.41	3.38	50.30	10:30
3	TOC	8.5446	85.4465	66.78	70.07	3.29	50.31	10:27
4	TOC	8.5009	85.0089	66.48	69.90	3.41	50.32	10:28

<u>Dilution</u>		<u>Blank Contribution</u>		<u>Method</u>		<u>Calibration</u>	
1:10		(TC) 8.7794 (IC) (v1284)		CAS_salt_010711 (v4)		CAS_salt_010711 (v30)	

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
9	TOC	K1907144-002.02	8.8362 ppm	0.1188 ppm	1.3400%	2019/08/14 03:22

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	9.0122	90.1224	69.95	73.16	3.20	50.34	10:27
2	TOC	8.7923	87.9229	68.46	71.73	3.27	50.36	10:26
3	TOC	8.7519	87.5193	68.19	71.59	3.41	50.36	10:25
4	TOC	8.7882	87.8817	68.43	71.67	3.23	50.37	10:28

<u>Dilution</u>		<u>Blank Contribution</u>		<u>Method</u>		<u>Calibration</u>	
1:10		(TC) 8.7794 (IC) (v1284)		CAS_salt_010711 (v4)		CAS_salt_010711 (v30)	

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 6

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	23.9417 ppm (PASS)	0.0000 ppm	0%	2019/08/14 04:17

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	23.9417	239.4165	171.98	175.31	3.34	50.37	10:33

<u>Completion State</u>	<u>Success Action</u>	<u>Method</u>	<u>Calibration</u>	<u>STD Conc - Pos B</u>
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	50 ppmC

Sample Type: Check Standard --> CCB From Schedule Version 6

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/08/14 04:32

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	6.18	9.59	3.41	50.40	10:34

<u>Completion State</u>	<u>Success Action</u>	<u>Method</u>	<u>Calibration</u>	<u>STD Conc - Pos D</u>
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	0 ppmC

Sample Type: Sample From Schedule Version 6

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
10	TOC	K1907284-001.02	7.6325 ppm	0.0339 ppm	0.4400%	2019/08/14 04:47

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	7.6657	76.6574	60.81	64.15	3.34	50.41	10:30
2	TOC	7.5933	75.9325	60.32	63.57	3.25	50.41	10:28
3	TOC	7.6553	76.5528	60.74	64.09	3.35	50.41	10:28
4	TOC	7.6158	76.1579	60.48	63.70	3.23	50.44	10:30

Dilution 1:10
Blank Contribution (TC) 8.7794 (IC) (v1284)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
11	TOC	K1907284-002.02	4.6789 ppm	0.0442 ppm	0.9400%	2019/08/14 05:43

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.7408	47.4084	40.96	44.32	3.36	50.47	10:26
2	TOC	4.6799	46.7985	40.55	43.86	3.32	50.47	10:28
3	TOC	4.6432	46.4317	40.30	43.59	3.29	50.47	10:28
4	TOC	4.6517	46.5171	40.36	43.62	3.26	50.47	10:27

Dilution 1:10
Blank Contribution (TC) 8.7794 (IC) (v1284)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
12	TOC	K1907284-003.02	3.9965 ppm	0.0249 ppm	0.6200%	2019/08/14 06:38

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.0073	40.0734	35.98	39.25	3.27	50.50	10:26
2	TOC	3.9945	39.9452	35.89	39.10	3.20	50.50	10:27
3	TOC	3.9630	39.6299	35.68	38.96	3.28	50.51	10:30
4	TOC	4.0213	40.2133	36.08	39.45	3.37	50.53	10:25

Dilution 1:10
Blank Contribution (TC) 8.7794 (IC) (v1284)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
13	TOC	K1907284-004.02 8x	4.6472 ppm	0.0317 ppm	0.6800%	2019/08/14 07:34

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.6367	46.3669	40.25	43.82	3.56	50.54	10:31
2	TOC	4.6205	46.2048	40.14	43.27	3.13	50.52	10:29
3	TOC	4.6385	46.3846	40.26	43.66	3.39	50.56	10:28
4	TOC	4.6933	46.9326	40.64	43.97	3.33	50.59	10:25

Dilution **Blank Contribution** **Method** **Calibration**

1:10 (TC) 8.7794 (IC) CAS_salt_010711 CAS_salt_010711
(v1284) (v4) (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
14	TOC	K1907284-005.02 8x	4.5431 ppm	0.0182 ppm	0.4000%	2019/08/14 08:30

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.5218	45.2178	39.47	42.87	3.40	50.49	10:26
2	TOC	4.5543	45.5434	39.69	42.85	3.15	50.53	10:30
3	TOC	4.5347	45.3474	39.56	42.84	3.28	50.46	10:29
4	TOC	4.5617	45.6170	39.74	42.94	3.19	50.42	10:30

Dilution 1:10 Blank Contribution (TC) 8.7794 (IC) (v1284) Method CAS_salt_010711 (v4) Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
15	TOC	K1907166-001.01	0.3970 ppm	0.0144 ppm	3.6200%	2019/08/14 09:25

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.4071	4.0713	11.54	14.63	3.08	50.42	10:27
2	TOC	0.3868	3.8680	11.40	14.59	3.19	50.38	10:24

Dilution 1:10 Blank Contribution (TC) 8.7794 (IC) (v1284) Method CAS_salt_010711 (v4) Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
16	TOC	K1907166-001.01 ms	26.1465 ppm	0.0000 ppm	0.0000%	2019/08/14 09:53

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	26.1465	261.4645	186.26	189.49	3.23	50.36	10:31

Dilution 1:10 Blank Contribution (TC) 8.7794 (IC) (v1284) Method CAS_salt_010711 (v4) Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
17	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2019/08/14 10:08

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.06	9.34	3.28	50.33	10:30
2	TOC	0.0000	0.0000	6.00	9.28	3.27	50.44	10:28

Dilution 1:10 Blank Contribution (TC) 8.7794 (IC) (v1284) Method CAS_salt_010711 (v4) Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
18	TOC	K1907235-001.02	2.8002 ppm	0.4286 ppm	15.3000%	2019/08/14 10:36

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.4972	24.9716	25.73	29.05	3.32	50.42	10:26
2	TOC	3.1032	31.0323	29.84	32.92	3.08	50.47	10:25

Dilution 1:10
Blank Contribution (TC) 8.7794 (IC) (v1284)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
19	TOC	K1907235-002.02	2.6271 ppm	0.0531 ppm	2.0200%	2019/08/14 11:04

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.6647	26.6466	26.87	30.24	3.37	50.43	10:27
2	TOC	2.5895	25.8953	26.36	29.84	3.48	50.48	10:31

Dilution 1:10
Blank Contribution (TC) 8.7794 (IC) (v1284)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm

From Schedule Version 6

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	23.8538 ppm (PASS)	0.0000 ppm	0%	2019/08/14 11:32

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	23.8538	238.5385	171.38	174.75	3.37	50.63	10:30

Completion State Success - Criteria met.
Success Action Do Nothing
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)
STD Conc - Pos B 50 ppmC

Sample Type: Check Standard --> CCB

From Schedule Version 6

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/08/14 11:47

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	6.28	9.55	3.28	50.66	10:34

Completion State Success - Criteria met.
Success Action Do Nothing
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)
STD Conc - Pos D 0 ppmC

Sample Type: Sample

From Schedule Version 6

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
20	TOC	MB2	0.0000 ppm	0.0000 ppm	0.0000%	2019/08/14 12:01

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	5.36	8.57	3.22	50.60	10:28

Dilution

1:10

Blank Contribution(TC) 8.7794 (IC)
(v1284)**Method**CAS_salt_010711
(v4)**Calibration**CAS_salt_010711
(v30)**Sample Type:** Check Standard --> LCS

From Schedule Version 6

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
C	TOC	25.0000	1:1	[TOC] LCS [24.0 ppm]	0 / infinity (NA / NA)	24.2958 ppm (PASS)	0.0000 ppm	0%	2019/08/14 12:16

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	24.2958	242.9581	174.38	177.72	3.34	50.58	10:30

Completion State

Success - Criteria met.

Success Action

Do Nothing

MethodCAS_salt_010711
(v4)**Calibration**CAS_salt_010711
(v30)**STD Conc - Pos C**

25 ppmC

Sample Type: Sample

From Schedule Version 6

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
21	TOC	K1907235-003.02	0.8505 ppm	0.0078 ppm	0.9200%	2019/08/14 12:30

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.8450	8.4496	14.52	18.00	3.48	50.57	10:27
2	TOC	0.8560	8.5601	14.59	17.75	3.16	50.56	10:31

Dilution

1:10

Blank Contribution(TC) 8.7794 (IC)
(v1284)**Method**CAS_salt_010711
(v4)**Calibration**CAS_salt_010711
(v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
22	TOC	K1907235-004.02	0.9212 ppm	0.0028 ppm	0.3100%	2019/08/14 12:59

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.9192	9.1921	15.02	18.27	3.25	50.53	10:30
2	TOC	0.9232	9.2319	15.05	18.37	3.32	50.51	10:25

Dilution

1:10

Blank Contribution

(TC) 8.7794 (IC)

Method

CAS_salt_010711

Calibration

CAS_salt_010711

(v1284)

(v4)

(v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
23	TOC	K1907274-001.01	0.5341 ppm	0.0350 ppm	6.5500%	2019/08/14 13:27

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.5589	5.5887	12.57	15.79	3.21	50.46	10:30
2	TOC	0.5094	5.0937	12.24	15.70	3.46	50.49	10:26

Dilution

1:10

Blank Contribution(TC) 8.7794 (IC)
(v1284)MethodCAS_salt_010711
(v4)CalibrationCAS_salt_010711
(v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
24	TOC	K1907274-002.01	0.9374 ppm	0.0074 ppm	0.7900%	2019/08/14 13:55

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.9322	9.3218	15.11	18.50	3.39	50.48	10:28
2	TOC	0.9426	9.4264	15.18	18.63	3.46	50.46	10:26

Dilution

1:10

Blank Contribution(TC) 8.7794 (IC)
(v1284)MethodCAS_salt_010711
(v4)CalibrationCAS_salt_010711
(v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
25	TOC	K1907274-003.01	0.9731 ppm	0.0490 ppm	5.0300%	2019/08/14 14:23

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.9385	9.3851	15.15	18.53	3.38	50.47	10:27
2	TOC	1.0078	10.0775	15.62	18.89	3.27	50.51	10:26

Dilution

1:10

Blank Contribution(TC) 8.7794 (IC)
(v1284)MethodCAS_salt_010711
(v4)CalibrationCAS_salt_010711
(v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
26	TOC	K1907276-001.01	2.2153 ppm	0.0508 ppm	2.2900%	2019/08/14 14:51

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.2513	22.5128	24.06	27.33	3.27	50.45	10:28
2	TOC	2.1794	21.7939	23.57	26.80	3.23	50.41	10:32

Dilution

1:10

Blank Contribution(TC) 8.7794 (IC)
(v1284)MethodCAS_salt_010711
(v4)CalibrationCAS_salt_010711
(v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
27	TOC	K1907382-001.01	1.4974 ppm	0.0598 ppm	3.9900%	2019/08/14 15:19

Rep	Base	ppm	µg	Adjusted	NDIR (Abs)	Baseline	Pressure	Run

#	Analysis Type			(Abs)		(Abs)	(psig)	Time
1	TOC	1.5397	15.3972	19.23	22.57	3.34	50.46	10:31
2	TOC	1.4552	14.5516	18.66	21.96	3.31	50.43	10:28

<u>Dilution</u>	<u>Blank Contribution</u>	<u>Method</u>	<u>Calibration</u>
1:10	(TC) 8.7794 (IC) (v1284)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
28	TOC	K1907383-001.01	0.3285 ppm	0.0576 ppm	17.5300%	2019/08/14 15:47

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.2878	2.8780	10.73	14.10	3.37	50.46	10:30
2	TOC	0.3693	3.6927	11.29	14.55	3.27	50.42	10:26

<u>Dilution</u>	<u>Blank Contribution</u>	<u>Method</u>	<u>Calibration</u>
1:10	(TC) 8.7794 (IC) (v1284)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 6

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	23.6193 ppm (PASS)	0.0000 ppm	0%	2019/08/14 16:15

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	23.6193	236.1932	169.79	172.95	3.16	50.41	10:30

<u>Completion State</u>	<u>Success Action</u>	<u>Method</u>	<u>Calibration</u>	<u>STD Conc - Pos B</u>
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	50 ppmC

Sample Type: Check Standard --> CCB From Schedule Version 6

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/08/14 16:30

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	5.80	9.05	3.25	50.40	10:36

<u>Completion State</u>	<u>Success Action</u>	<u>Method</u>	<u>Calibration</u>	<u>STD Conc - Pos D</u>
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	0 ppmC

Sample Type: Sample

From Schedule Version 6

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
29	TOC	K1907383-002.01	0.8131 ppm	0.0452 ppm	5.5600%	2019/08/14 16:45

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.8451	8.4511	14.52	17.74	3.23	50.43	10:28
2	TOC	0.7812	7.8117	14.08	17.46	3.37	50.40	10:27

Dilution 1:10
Blank Contribution (TC) 8.7794 (IC) (v1284)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
30	TOC	K1907383-003.01	0.0000 ppm	0.0000 ppm	0.0000%	2019/08/14 17:13

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	8.08	11.47	3.40	50.41	10:25
2	TOC	0.0000	0.0000	7.94	11.42	3.48	50.41	10:24

Dilution 1:10
Blank Contribution (TC) 8.7794 (IC) (v1284)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
31	TOC	K1907383-004.01	0.0307 ppm	0.0434 ppm	141.4200%	2019/08/14 17:41

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	8.43	11.84	3.41	50.45	10:28
2	TOC	0.0614	0.6137	9.20	12.28	3.08	50.43	10:24

Dilution 1:10
Blank Contribution (TC) 8.7794 (IC) (v1284)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
32	TOC	T1901331-001.05 doc	1.6386 ppm	0.0198 ppm	1.2100%	2019/08/14 18:09

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.6246	16.2458	19.81	23.15	3.34	50.46	10:25
2	TOC	1.6526	16.5257	20.00	23.30	3.31	50.45	10:26

Dilution 1:10
Blank Contribution (TC) 8.7794 (IC) (v1284)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
33	TOC	T1901331-001.05 ms doc 2x	21.7509 ppm	0.0000 ppm	0.0000%	2019/08/14 18:37

Rep	Base	ppm	µg	Adjusted	NDIR (Abs)	Baseline	Pressure	Run
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#	Analysis Type			(Abs)		(Abs)	(psig)	Time
1	TOC	21.7509	217.5086	156.42	159.77	3.34	50.43	10:30

Dilution 1:10
Blank Contribution (TC) 8.7794 (IC) (v1284)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
34	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2019/08/14 18:52

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	5.76	9.15	3.39	50.38	10:34

Dilution 1:10
Blank Contribution (TC) 8.7794 (IC) (v1284)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
35	TOC	T1901331-002.05 doc	2.1533 ppm	0.0367 ppm	1.7000%	2019/08/14 19:06

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.1792	21.7924	23.57	26.84	3.27	50.30	10:25
2	TOC	2.1274	21.2738	23.22	26.60	3.38	50.24	10:26

Dilution 1:10
Blank Contribution (TC) 8.7794 (IC) (v1284)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
36	TOC	T1901331-003.05 doc	2.5274 ppm	0.0860 ppm	3.4000%	2019/08/14 19:34

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.4665	24.6652	25.52	28.98	3.46	50.18	10:29
2	TOC	2.5882	25.8820	26.35	29.65	3.30	50.16	10:26

Dilution 1:10
Blank Contribution (TC) 8.7794 (IC) (v1284)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
37	TOC	T1901331-004.05 doc	0.5220 ppm	0.0236 ppm	4.5300%	2019/08/14 20:02

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.5052	5.0524	12.21	15.40	3.19	50.13	10:32
2	TOC	0.5387	5.3868	12.44	15.51	3.07	50.13	10:28

Dilution 1:10
Blank Contribution (TC) 8.7794 (IC) (v1284)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
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◆	38	TOC	T1901331-005.05 doc	0.5488 ppm	0.0303 ppm	5.5200%	2019/08/14 20:30		
Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time	
1	TOC	0.5273	5.2734	12.36	15.64	3.28	50.12	10:32	
2	TOC	0.5702	5.7021	12.65	15.83	3.18	50.10	10:30	
<u>Dilution</u>		<u>Blank Contribution</u>		<u>Method</u>	<u>Calibration</u>				
1:10		(TC) 8.7794 (IC) (v1284)		CAS_salt_010711 (v4)	CAS_salt_010711 (v30)				

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 6

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	B	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	24.3640 ppm (PASS)	0.0000 ppm	0%	2019/08/14 20:59

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.3640	243.6402	174.84	178.13	3.29	50.11	10:33

<u>Completion State</u>	<u>Success Action</u>	<u>Method</u>	<u>Calibration</u>	<u>STD Conc - Pos B</u>
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	50 ppmC

Sample Type: Check Standard --> CCB From Schedule Version 6

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	D	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/08/14 21:13

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	5.70	9.11	3.41	50.11	10:31

<u>Completion State</u>	<u>Success Action</u>	<u>Method</u>	<u>Calibration</u>	<u>STD Conc - Pos D</u>
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	0 ppmC

Sample Type: Sample From Schedule Version 6

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time	
◆	39	TOC	MB3	0.0000 ppm	0.0000 ppm	0.0000%	2019/08/14 21:28

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	4.97	8.33	3.36	50.10	10:32

<u>Dilution</u>	<u>Blank Contribution</u>	<u>Method</u>	<u>Calibration</u>
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1:10 (TC) 8.7794 (IC) CAS_salt_010711 CAS_salt_010711
(v1284) (v4) (v30)

Sample Type: Check Standard --> LCS

From Schedule Version 6

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◊ C	TOC	25.0000	1:1	[TOC] LCS [25.0 ppm]	0 / infinity (NA / NA)	25.0172 ppm (PASS)	0.0000 ppm	0%	2019/08/14 21:43

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	25.0172	250.1724	179.28	182.63	3.36	50.11	10:33

Completion State Success - Criteria met.
Success Action Do Nothing
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)
STD Conc - Pos C 25 ppmC

Sample Type: Sample

From Schedule Version 6

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◊ 40	TOC	T1901331-006.05 doc	0.5444 ppm	0.0344 ppm	6.3100%	2019/08/14 21:57

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.5687	5.6874	12.64	16.22	3.58	50.17	10:27
2	TOC	0.5201	5.2012	12.31	15.65	3.34	50.17	10:28

Dilution 1:10
Blank Contribution (TC) 8.7794 (IC) (v1284)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◊ 41	TOC	T1901331-007.05 doc	2.8722 ppm	0.0204 ppm	0.7100%	2019/08/14 22:25

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.8578	28.5780	28.18	31.63	3.46	50.19	10:25
2	TOC	2.8867	28.8667	28.37	31.83	3.45	50.22	10:26

Dilution 1:10
Blank Contribution (TC) 8.7794 (IC) (v1284)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◊ 42	TOC	T1901331-008.05 doc	3.2852 ppm	0.0006 ppm	0.0200%	2019/08/14 22:53

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.2856	32.8561	31.08	34.41	3.32	50.24	10:29
2	TOC	3.2847	32.8473	31.08	34.33	3.25	50.25	10:27

Dilution 1:10 **Blank Contribution** (TC) 8.7794 (IC) (v1284) **Method** CAS_salt_010711 (v4) **Calibration** CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
43	TOC	T1901331-009.05 doc	3.8142 ppm	0.0063 ppm	0.1600%	2019/08/14 23:21

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.8098	38.0978	34.64	37.97	3.33	50.26	10:24
2	TOC	3.8186	38.1862	34.70	37.89	3.19	50.27	10:25

Dilution 1:10 **Blank Contribution** (TC) 8.7794 (IC) (v1284) **Method** CAS_salt_010711 (v4) **Calibration** CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
44	TOC	T1901331-010.05 doc	0.5024 ppm	0.0078 ppm	1.5600%	2019/08/14 23:49

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.4968	4.9685	12.15	15.45	3.29	50.27	10:26
2	TOC	0.5079	5.0789	12.23	15.63	3.40	50.29	10:27

Dilution 1:10 **Blank Contribution** (TC) 8.7794 (IC) (v1284) **Method** CAS_salt_010711 (v4) **Calibration** CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
45	TOC	T1901331-011.05 doc	0.6490 ppm	0.0176 ppm	2.7100%	2019/08/15 00:17

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.6365	6.3651	13.10	16.55	3.45	50.32	10:27
2	TOC	0.6614	6.6140	13.27	16.55	3.28	50.32	10:29

Dilution 1:10 **Blank Contribution** (TC) 8.7794 (IC) (v1284) **Method** CAS_salt_010711 (v4) **Calibration** CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
46	TOC	T1901331-012.05 doc	1.1911 ppm	0.0676 ppm	5.6800%	2019/08/15 00:45

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.2389	12.3890	17.19	20.61	3.42	50.32	10:31
2	TOC	1.1433	11.4329	16.54	19.94	3.40	50.34	10:26

Dilution 1:10 **Blank Contribution** (TC) 8.7794 (IC) (v1284) **Method** CAS_salt_010711 (v4) **Calibration** CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
47	TOC	T1901331-013.05 doc	4.4992 ppm	0.0095 ppm	0.2100%	2019/08/15 01:14

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.5059	45.0587	39.36	42.76	3.40	50.37	10:26
2	TOC	4.4925	44.9246	39.27	42.64	3.37	50.37	10:24
<u>Dilution</u>		<u>Blank Contribution</u>		<u>Method</u>	<u>Calibration</u>			
1:10		(TC) 8.7794 (IC) (v1284)		CAS_salt_010711 (v4)	CAS_salt_010711 (v30)			

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 6

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time	
♦ B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	23.6803 ppm (PASS)	0.0000 ppm	0%	2019/08/15 01:42	
Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	23.6803	236.8031	170.20	173.51	3.30	50.39	10:32
<u>Completion State</u>		<u>Success Action</u>		<u>Method</u>	<u>Calibration</u>	<u>STD Conc - Pos B</u>				
Success - Criteria met.		Do Nothing		CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	50 ppmC				

Sample Type: Check Standard --> CCB From Schedule Version 6

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time	
♦ D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/08/15 01:56	
Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	5.42	8.69	3.27	50.40	10:29
<u>Completion State</u>		<u>Success Action</u>		<u>Method</u>	<u>Calibration</u>	<u>STD Conc - Pos D</u>				
Success - Criteria met.		Do Nothing		CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	0 ppmC				

Sample Type: Sample From Schedule Version 6

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time		
♦ 48	TOC	T1901331-014.05 doc	4.6869 ppm	0.0233 ppm	0.5000%	2019/08/15 02:11		
Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.7034	47.0342	40.71	43.91	3.20	50.40	10:28
2	TOC	4.6704	46.7042	40.48	43.80	3.31	50.42	10:26
<u>Dilution</u>		<u>Blank Contribution</u>		<u>Method</u>	<u>Calibration</u>			

1:10 (TC) 8.7794 (IC) CAS_salt_010711 CAS_salt_010711
(v1284) (v4) (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
49	TOC	T1901331-015.05 doc	4.9758 ppm	0.0229 ppm	0.4600%	2019/08/15 02:39

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.9920	49.9202	42.66	45.94	3.27	50.43	10:28
2	TOC	4.9596	49.5961	42.44	45.69	3.24	50.45	10:26

Dilution 1:10 Blank Contribution (TC) 8.7794 (IC) (v1284) Method CAS_salt_010711 (v4) Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
50	TOC	T1901331-016.05 doc	1.6777 ppm	0.1103 ppm	6.5800%	2019/08/15 03:07

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.7557	17.5570	20.70	23.96	3.26	50.44	10:29
2	TOC	1.5997	15.9968	19.64	23.19	3.55	50.45	10:27

Dilution 1:10 Blank Contribution (TC) 8.7794 (IC) (v1284) Method CAS_salt_010711 (v4) Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
51	TOC	T1901331-017.05 doc	1.7142 ppm	0.0704 ppm	4.1100%	2019/08/15 03:35

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.7639	17.6395	20.75	24.05	3.29	50.46	10:27
2	TOC	1.6644	16.6436	20.08	23.29	3.21	50.48	10:32

Dilution 1:10 Blank Contribution (TC) 8.7794 (IC) (v1284) Method CAS_salt_010711 (v4) Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
52	TOC	T1901331-018.05 doc	3.8977 ppm	0.0135 ppm	0.3500%	2019/08/15 04:03

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.9073	39.0731	35.30	38.62	3.32	50.49	10:25
2	TOC	3.8882	38.8815	35.17	38.59	3.41	50.49	10:27

Dilution 1:10 Blank Contribution (TC) 8.7794 (IC) (v1284) Method CAS_salt_010711 (v4) Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
53	TOC	T1901331-019.05 doc	5.1501 ppm	0.0013 ppm	0.0200%	2019/08/15 04:31

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	5.1510	51.5098	43.74	47.17	3.42	50.51	10:26
2	TOC	5.1492	51.4921	43.73	47.21	3.47	50.50	10:24

Dilution 1:10
Blank Contribution (TC) 8.7794 (IC) (v1284)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◊ 54	TOC	T1901331-020.05 doc	5.1889 ppm	0.0324 ppm	0.6200%	2019/08/15 04:59

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	5.2118	52.1183	44.16	47.36	3.20	50.53	10:31
2	TOC	5.1660	51.6601	43.85	47.11	3.26	50.53	10:26

Dilution 1:10
Blank Contribution (TC) 8.7794 (IC) (v1284)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◊ 55	TOC	T1901331-021.05 doc	5.1566 ppm	0.0479 ppm	0.9300%	2019/08/15 05:27

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	5.1905	51.9046	44.01	47.13	3.12	50.54	10:27
2	TOC	5.1227	51.2270	43.55	46.79	3.24	50.55	10:27

Dilution 1:10
Blank Contribution (TC) 8.7794 (IC) (v1284)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◊ 56	TOC	T1901331-021.05 ms doc	30.7948 ppm	0.0000 ppm	0.0000%	2019/08/15 05:55

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	30.7948	307.9484	217.81	221.21	3.39	50.58	10:31

Dilution 1:10
Blank Contribution (TC) 8.7794 (IC) (v1284)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◊ 57	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2019/08/15 06:10

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.07	9.27	3.20	50.55	10:33

Dilution 1:10
Blank Contribution (TC) 8.7794 (IC) (v1284)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm										From Schedule Version 6	
Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time		
◆	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	23.2691 ppm (PASS)	0.0000 ppm	0%	2019/08/15 06:25	
Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time	
B	TOC	25 ppm	1	23.2691	232.6914	167.41	170.70	3.29	50.55	10:29	
Completion State		Success Action		Method		Calibration		STD Conc - Pos B			
Success - Criteria met.		Do Nothing		CAS_salt_010711 (v4)		CAS_salt_010711 (v30)		50 ppmC			

Sample Type: Check Standard --> CCB										From Schedule Version 6	
Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time		
◆	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/08/15 06:40	
Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time	
D	TOC	0 ppm	1	0.0000	0.0000	5.14	8.39	3.25	50.59	10:32	
Completion State		Success Action		Method		Calibration		STD Conc - Pos D			
Success - Criteria met.		Do Nothing		CAS_salt_010711 (v4)		CAS_salt_010711 (v30)		0 ppmC			

Sample Type: Sample							From Schedule Version 6					
Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time						
◆	58	TOC	MB4	0.0000 ppm	0.0000 ppm	0.0000%	2019/08/15 06:54					
Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time				
1	TOC	0.0000	0.0000	4.38	7.65	3.27	50.57	10:31				
Dilution		Blank Contribution		Method		Calibration						
1:10		(TC) 8.7794 (IC) (v1284)		CAS_salt_010711 (v4)		CAS_salt_010711 (v30)						

Sample Type: Check Standard --> LCS										From Schedule Version 6	
Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time		
◆	C	TOC	25.0000	1:1	[TOC] LCS [25.0 ppm]	0 / infinity (NA / NA)	24.5197 ppm (PASS)	0.0000 ppm	0%	2019/08/15 07:09	

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	24.5197	245.1974	175.90	179.22	3.32	50.57	10:32

Completion State Success - Criteria met.	Success Action Do Nothing	Method CAS_salt_010711 (v4)	Calibration CAS_salt_010711 (v30)	STD Conc - Pos C 25 ppmC
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Sample Type: Sample

From Schedule Version 6

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
59	TOC	T1901331-022.05 doc	4.3889 ppm	0.0300 ppm	0.6800%	2019/08/15 07:24

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.4101	44.1011	38.71	42.04	3.33	50.56	10:27
2	TOC	4.3677	43.6768	38.43	41.65	3.22	50.58	10:27

Dilution 1:10	Blank Contribution (TC) 8.7794 (IC) (v1284)	Method CAS_salt_010711 (v4)	Calibration CAS_salt_010711 (v30)
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Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
60	TOC	T1901331-023.05 doc	5.0732 ppm	0.0017 ppm	0.0300%	2019/08/15 07:52

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	5.0744	50.7438	43.22	46.64	3.42	50.58	10:28
2	TOC	5.0720	50.7202	43.21	46.59	3.39	50.58	10:25

Dilution 1:10	Blank Contribution (TC) 8.7794 (IC) (v1284)	Method CAS_salt_010711 (v4)	Calibration CAS_salt_010711 (v30)
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Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
61	TOC	T1901331-024.05 doc	5.1299 ppm	0.0827 ppm	1.6100%	2019/08/15 08:20

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	5.1884	51.8840	44.00	47.25	3.25	50.53	10:30
2	TOC	5.0714	50.7143	43.20	46.65	3.44	50.53	10:30

Dilution 1:10	Blank Contribution (TC) 8.7794 (IC) (v1284)	Method CAS_salt_010711 (v4)	Calibration CAS_salt_010711 (v30)
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Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
62	TOC	T1901331-025.05 doc	5.1841 ppm	0.0073 ppm	0.1400%	2019/08/15 08:48

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	5.1790	51.7897	43.93	47.30	3.37	50.52	10:29
2	TOC	5.1893	51.8929	44.00	47.41	3.41	50.53	10:29

Dilution 1:10 **Blank Contribution** (TC) 8.7794 (IC) (v1284) **Method** CAS_salt_010711 (v4) **Calibration** CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
63	TOC	T1901331-026.05 doc	5.1189 ppm	0.0020 ppm	0.0400%	2019/08/15 09:16

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	5.1203	51.2034	43.54	46.84	3.31	50.55	10:25
2	TOC	5.1175	51.1754	43.52	46.68	3.16	50.52	10:27

Dilution 1:10 **Blank Contribution** (TC) 8.7794 (IC) (v1284) **Method** CAS_salt_010711 (v4) **Calibration** CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
64	TOC	T1901331-027.05 doc	5.1991 ppm	0.0193 ppm	0.3700%	2019/08/15 09:44

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	5.1855	51.8545	43.98	47.28	3.30	50.50	10:24
2	TOC	5.2127	52.1271	44.16	47.29	3.13	50.48	10:26

Dilution 1:10 **Blank Contribution** (TC) 8.7794 (IC) (v1284) **Method** CAS_salt_010711 (v4) **Calibration** CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
65	TOC	T1901331-028.05 doc	5.0031 ppm	0.0497 ppm	0.9900%	2019/08/15 10:12

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	5.0383	50.3828	42.98	46.46	3.48	50.46	10:27
2	TOC	4.9680	49.6801	42.50	45.88	3.38	50.45	10:25

Dilution 1:10 **Blank Contribution** (TC) 8.7794 (IC) (v1284) **Method** CAS_salt_010711 (v4) **Calibration** CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
66	TOC	T1901331-029.05 doc	5.1780 ppm	0.0605 ppm	1.1700%	2019/08/15 10:40

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	5.2208	52.2081	44.22	47.44	3.22	50.41	10:29
2	TOC	5.1352	51.3522	43.64	46.85	3.21	50.41	10:27

Dilution 1:10 **Blank Contribution** (TC) 8.7794 (IC) (v1284) **Method** CAS_salt_010711 (v4) **Calibration** CAS_salt_010711 (v30)

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
* B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	23.4380 ppm (PASS)	0.0000 ppm	0%	2019/08/15 11:09

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	23.4380	234.3796	168.56	172.00	3.44	50.39	10:32

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	50 ppmC

Sample Type: Check Standard --> CCB From Schedule Version 6

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
* D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/08/15 11:23

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	5.47	8.71	3.24	50.37	10:34

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	0 ppmC

Sample Type: Sample From Schedule Version 6

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
* 67	TOC	T1901331-030.05 doc	5.1021 ppm	0.0145 ppm	0.2800%	2019/08/15 11:38

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	5.0919	50.9191	43.34	46.63	3.28	50.36	10:31
2	TOC	5.1124	51.1238	43.48	46.75	3.27	50.34	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7794 (IC) (v1284)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
* 68	TOC	T1901331-031.05 doc	4.5003 ppm	0.0581 ppm	1.2900%	2019/08/15 12:06

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.5414	45.4137	39.61	42.86	3.26	50.34	10:30
2	TOC	4.4592	44.5917	39.05	42.37	3.32	50.34	10:32

Dilution	Blank Contribution	Method	Calibration
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1:10 (TC) 8.7794 (IC) CAS_salt_010711 CAS_salt_010711
(v1284) (v4) (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
69	TOC	T1901331-032.05 doc	5.1514 ppm	0.0389 ppm	0.7500%	2019/08/15 12:34

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	5.1239	51.2387	43.56	46.85	3.29	50.35	10:27
2	TOC	5.1788	51.7883	43.93	47.22	3.28	50.29	10:28

Dilution 1:10 Blank Contribution (TC) 8.7794 (IC) (v1284) Method CAS_salt_010711 (v4) Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
70	TOC	T1901331-033.05 doc	5.1841 ppm	0.0515 ppm	0.9900%	2019/08/15 13:03

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	5.2205	52.2052	44.22	47.42	3.21	50.33	10:29
2	TOC	5.1477	51.4774	43.72	47.01	3.29	50.29	10:25

Dilution 1:10 Blank Contribution (TC) 8.7794 (IC) (v1284) Method CAS_salt_010711 (v4) Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
71	TOC	T1901331-034.05 doc	4.2682 ppm	0.0058 ppm	0.1400%	2019/08/15 13:31

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.2641	42.6411	37.72	40.96	3.24	50.33	10:29
2	TOC	4.2724	42.7236	37.78	41.14	3.36	50.33	10:31

Dilution 1:10 Blank Contribution (TC) 8.7794 (IC) (v1284) Method CAS_salt_010711 (v4) Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
72	TOC	T1901331-035.05 doc	2.7757 ppm	0.0778 ppm	2.8000%	2019/08/15 13:59

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.8307	28.3069	27.99	31.31	3.32	50.30	10:28
2	TOC	2.7206	27.2064	27.25	30.49	3.25	50.32	10:27

Dilution 1:10 Blank Contribution (TC) 8.7794 (IC) (v1284) Method CAS_salt_010711 (v4) Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
73	TOC	T1901331-036.05 doc	3.8678 ppm	0.0002 ppm	0.0100%	2019/08/15 14:27

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.8680	38.6797	35.04	38.23	3.19	50.37	10:27
2	TOC	3.8677	38.6768	35.03	38.37	3.34	50.32	10:28
<u>Dilution</u>		<u>Blank Contribution</u>		<u>Method</u>	<u>Calibration</u>			
1:10		(TC) 8.7794 (IC) (v1284)		CAS_salt_010711 (v4)	CAS_salt_010711 (v30)			
Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time		
74	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2019/08/15 14:55		
Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	5.17	8.44	3.27	50.34	10:29
2	TOC	0.0000	0.0000	6.35	9.64	3.29	50.37	10:29
<u>Dilution</u>		<u>Blank Contribution</u>		<u>Method</u>	<u>Calibration</u>			
1:10		(TC) 8.7794 (IC) (v1284)		CAS_salt_010711 (v4)	CAS_salt_010711 (v30)			
Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time		
75	TOC	Lot check 190516	0.0000 ppm	0.0000 ppm	0.0000%	2019/08/15 15:23		
Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	4.71	8.03	3.32	50.36	10:28
2	TOC	0.0000	0.0000	4.58	8.12	3.54	50.34	10:25
<u>Dilution</u>		<u>Blank Contribution</u>		<u>Method</u>	<u>Calibration</u>			
1:10		(TC) 8.7794 (IC) (v1284)		CAS_salt_010711 (v4)	CAS_salt_010711 (v30)			

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 6

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time	
75	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	23.4044 ppm (PASS)	0.0000 ppm	0%	2019/08/15 15:51	
Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	23.4044	234.0438	168.33	171.56	3.23	50.36	10:30
<u>Completion State</u>		<u>Success Action</u>		<u>Method</u>	<u>Calibration</u>		<u>STD Conc - Pos B</u>			
Success - Criteria met.		Do Nothing		CAS_salt_010711 (v4)	CAS_salt_010711 (v30)		50 ppmC			

Sample Type: Check Standard --> CCB From Schedule Version 6

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time

◆	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/08/15 16:06
Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	5.19	8.61	3.42	50.37	10:31
Completion State		Success Action		Method		Calibration		STD Conc - Pos D		
Success - Criteria met.		Do Nothing		CAS_salt_010711 (v4)		CAS_salt_010711 (v30)		0 ppmC		

Meta Data Used in this Report

Blanks

Version	Reagent (Abs)	Acid (Abs)	DI IC (Abs)	DI TC (Abs)	DI TOC (Abs)	Save Time	Operator
v1283	2.0090	1.4730	0.0000	0.0000	0.0000	2019/08/08 17:50	Fusion1 (Fusion1)
v1284	1.3160	1.4350	0.0000	0.0000	0.0000	2019/08/13 19:38	Fusion1 (Fusion1)

Calibrations

Name: CAS_salt_010711 (TOC)

Version: v30
 Calibration curve formula: TOC: $y = 6.788x + 9.463$
 Ver Creation: 2019/03/05 17:42
 r^2 value: TOC: $r^2 = 0.99963$
 Comment:
 Operator: Fusion1 (Fusion1)
 Basic Analysis Type: TOC

Basic Analysis Type: TOC

Sample ID	Y Raw Value	X Expected	Message	End Time
DI Water	7.8970	0.0000		2019/03/05 16:15
0.500 ppm	11.5280	0.5000		2019/03/05 16:29
1.0 ppm	14.9760	1.0000		2019/03/05 16:44
5.0 ppm	43.6500	5.0000		2019/03/05 16:58
10 ppm	79.6020	10.0000		2019/03/05 17:12
25 ppm	183.3580	25.0000		2019/03/05 17:26
50 ppm	346.3230	50.0000		2019/03/05 17:40

Methods

Name: CAS_salt_010711 (TOC)

Version: v4 Operator: Fusion1 (Fusion1)
 Ver Creation: 2019/02/21 17:57
 Comment:

Parameter	Value	Advanced Parameter	Value
SampleVolume	10.0 mL	NeedleRinseVolume	5.0 ml
Dilution	1:10	VialPrimeVolume	2.0 ml
AcidVolume	0.5 ml	ICSamplePrimeVolume	2.0 ml
ReagentVolume	2.0 ml	ICSpargeRinseVolume	12.0 ml
UVReactorPrerinse	Off	BaselineStabilizeTime	0.70 min
UVReactorPrerinseVolume	5.0	DetectorPressureFlow	150 ml/min
NumberOfUVReactorPrerinses	1	SyringeSpeedWaste	10
ICSpargeTime	1.00 mins	SyringeSpeedAcid	7
DetectorSweepFlow	500 ml/min	SyringeSpeedReagent	7
PreSpargeTime	2.00 mins	SyringeSpeedDIWater	7
SystemFlow	500 ml/min	NDIRPressurization	60 psig
		SyringeSpeedSampleDispense	5
		SyringeSpeedSampleAspirate	4
		SyringeSpeedUVDispense	5
		SyringeSpeedUVAspirate	5
		SyringeSpeedICDispense	5
		SyringeSpeedICAspirate	5
		NDIRPressureStabilize	1.75 min
		SampleMixing	Off
		SampleMixingCycles	1
		SampleMixingVolume	10.0
		LowLevelFilterNDIR	Off

Acceptance / Approval

Electronic Signatures

Report Version	User Name	Acceptance	Reason	Date
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Report History

Report History

Report Version	User Name	System Reason	User Reason	Date
1	Fusion1 (Fusion1)	Schedule completed	Schedule completed	2019/08/15 16:24



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

LABORATORY REPORT

August 19, 2019

RJ Modashia
ALS Laboratory Group
10450 Stancliff Road Suite 210
Houston, TX 77099-4338

RE: HS19080238 / HS19080238

Dear RJ:

Enclosed are the results of the samples submitted to our laboratory on August 7, 2019. For your reference, these analyses have been assigned our service request number P1904674.

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 2:23 pm, Aug 19, 2019

Hayden Akers
Project Manager



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

Client: ALS Laboratory Group
 Project: HS19080238 / HS19080238

Service Request No: P1904674

CASE NARRATIVE

The samples were received intact under chain of custody on August 7, 2019 and were stored in accordance with the analytical method requirements. Please refer to the sample acceptance check form for additional information. The results reported herein are applicable only to the condition of the samples at the time of sample receipt.

Carbon Dioxide Analysis

The samples were analyzed for carbon dioxide using a gas chromatograph equipped with a thermal conductivity detector (TCD). A known amount of liquid was displaced by injecting 8.0 milliliters of helium creating a headspace in the sample vial. Each sample vial was agitated using a sonic disrupter for fifteen minutes and then allowed to equilibrate for at least four hours. A volume of the headspace was withdrawn using a gas-tight syringe and analyzed using a manual injection technique. The amount of dissolved gases (carbon dioxide) in the original sample was calculated using Henry's Law. This method was performed with guidance from RSK 175 as described in laboratory SOP VOA-DISGAS. This analyte is included on the laboratory's NELAP and DoD-ELAP scope of accreditation.

Methane, Ethene and Ethane Analysis

The samples were also analyzed for methane, ethene and ethane using a gas chromatograph equipped with a flame ionization detector (FID). A known amount of liquid was displaced by injecting 8.0 milliliters of helium creating a headspace in the sample vial. Each sample vial was agitated using a sonic disrupter for fifteen minutes and then allowed to equilibrate for at least two hours. A volume of the headspace was withdrawn using a gas-tight syringe and analyzed using a manual injection technique. The amount of dissolved gases (methane, ethene and ethane) in the original sample was calculated using Henry's Law. This method was performed with guidance from RSK 175. This method is included on the laboratory's NELAP and DoD-ELAP scope of accreditation.

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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ALS Environmental – Simi Valley

CERTIFICATIONS, ACCREDITATIONS, AND REGISTRATIONS

Agency	Web Site	Number
Alaska DEC	http://dec.alaska.gov/eh/lab.aspx	17-019
Arizona DHS	http://www.azdhs.gov/preparedness/state-laboratory/lab-licensure-certification/index.php#laboratory-licensure-home	AZ0694
Florida DOH (NELAP)	http://www.floridahealth.gov/licensing-and-regulation/environmental-laboratories/index.html	E871020
Louisiana DEQ (NELAP)	http://www.deq.louisiana.gov/page/la-lab-accreditation	05071
Maine DHHS	http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/professionals/labCert.shtml	2018027
Minnesota DOH (NELAP)	http://www.health.state.mn.us/accreditation	1521096
New Jersey DEP (NELAP)	http://www.nj.gov/dep/enforcement/oqa.html	CA009
New York DOH (NELAP)	http://www.wadsworth.org/labcert/elap/elap.html	11221
Oregon PHD (NELAP)	http://www.oregon.gov/oha/ph/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	4068-006
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	CA01627201 9-10
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 Laboratory Group
 Project ID: HS19080238 / HS19080238

Service Request: P1904674

Date Received: 8/7/2019
 Time Received: 09:05

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	RSK 175 - CO2	RSK 175 - Gases
35BWW08.190805	P1904674-001	Water	8/5/2019	11:00	X	X
35BWW04.190805	P1904674-002	Water	8/5/2019	12:00	X	X
35BWW12.190805	P1904674-003	Water	8/5/2019	12:55	X	X
35BWW12.190805-FD	P1904674-004	Water	8/5/2019	12:55	X	X



P1904674

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: Texas

COC ID: 11920

SUBCONTRACT TO:

ALS Environmental
2655 Park Center Drive, Suite A
Simi Valley, CA 93065

Phone: +1 805 526 7161

CUSTOMER INFORMATION:

Company: ALS Houston
Contact: RJ Modashia
Address: 10450 Stancliff Rd, Ste 210
Phone: +1 281 530 5656
Email: RJ.Modashia@alsglobal.com
Alternate Contact:
Email:

INVOICE INFORMATION:

Company: ALS Houston
Contact: Accounts Payable
Address: 10450 Stancliff Rd, Ste 210
Phone: +1 281 530 5656
Reference: HS19080238
TSR: Sonia West

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	HS19080238-06	35BWW08.190805	Groundwater	05 Aug 2019 11:00
	MEE + CO2. DOD IV. Equis EDD. EQUIS 5.0 - Longhorn			20 Aug 2019
2.	HS19080238-07	35BWW04.190805	Groundwater	05 Aug 2019 12:00
	MEE + CO2. DOD IV. Equis EDD. EQUIS 5.0 - Longhorn			20 Aug 2019
3.	HS19080238-08	35BWW12.190805	Groundwater	05 Aug 2019 12:55
	MEE + CO2. DOD IV. Equis EDD. EQUIS 5.0 - Longhorn			20 Aug 2019
4.	HS19080238-09	35BWW12.190805-FD	Groundwater	05 Aug 2019 12:55
	MEE + CO2. DOD IV. Equis EDD. EQUIS 5.0 - Longhorn			20 Aug 2019

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

QC Level: DOD IV (DoD Data Package)

Relinquished By: _____

Date/Time: _____

8/6/19 1800

Received By: _____

Date/Time: _____

8/7/19 0905

Cooler ID(s): _____

Temperature(s): _____

2°C
WST

RIGHT SOLUTIONS (RIGHT PARTNER)

ALS Environmental
Sample Acceptance Check Form

Client: ALS Laboratory Group Work order: P1904674
Project: HS19080238 / HS19080238
Sample(s) received on: 8/7/19 Date opened: 8/7/19 by: ADDAVID

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P1904674-003.04	40ml VOA HCL		1		A	wh 8/12/19
P1904674-003.05	40ml VOA HCL				A	
P1904674-003.06	40ml VOA HCL				A	
P1904674-004.01	40mL VOA NP		7		A	wh 8/13/19
P1904674-004.02	40mL VOA NP				A	
P1904674-004.03	40mL VOA NP				A	
P1904674-004.04	40ml VOA HCL		1		A	wh 8/12/19
P1904674-004.05	40ml VOA HCL				A	
P1904674-004.06	40ml VOA HCL				A	

Explain any discrepancies: (include lab sample ID numbers): _____

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 1

Client: ALS Laboratory Group
Client Project ID: HS19080238 / HS19080238

ALS Project ID: P1904674

Carbon Dioxide

Test Code: RSK 175
Instrument ID: HP5890A/GC10/TCD
Analyst: Wade Henton
Matrix: Water
Test Notes:

Date(s) Collected: 8/5/19
Date Received: 8/7/19
Date Analyzed: 8/13/19

Client Sample ID	ALS Sample ID	Injection Volume ml(s)	Result µg/L	LOQ µg/L	LOD µg/L	MDL µg/L	Data Qualifier
35BWW08.190805	P1904674-001	0.10	15,000	1,000	860	370	
35BWW04.190805	P1904674-002	0.10	280,000	1,000	860	370	
35BWW12.190805	P1904674-003	0.10	140,000	1,000	860	370	
35BWW12.190805-FD	P1904674-004	0.10	140,000	1,000	860	370	
Method Control Sample	P190813-MB	0.10	860	1,000	860	370	U

The Method Control Sample is laboratory water carried through the entire analytical process.

U = Compound was analyzed for, but not detected above the laboratory detection limit.

LOQ = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

LABORATORY CONTROL SAMPLE / DUPLICATE LABORATORY CONTROL SAMPLE SUMMARY

Page 1 of 1

Client: ALS Laboratory Group
Client Sample ID: Duplicate Lab Control Sample
Client Project ID: HS19080238 / HS19080238

ALS Project ID: P1904674
 ALS Sample ID: P190813-DLCS

Test Code: RSK 175
 Instrument ID: HP5890A/GC10/TCD
 Analyst: Wade Henton
 Matrix: Water
 Test Notes:

Date Collected: NA
 Date Received: NA
 Date Analyzed: 8/13/19
 Volume(s) Analyzed: NA ml(s)

CAS #	Compound	Spike Amount	Result ₁		% Recovery		DOD	RPD	RPD	Data
		LCS / DLCS ug/L	LCS ug/L	DLCS ug/L	LCS	DLCS	Acceptance Limits			
7782-44-7	Oxygen/Argon*	22,900	19,700	20,000	86	87	50-150	1	30	

₁ = The concentration shown includes a subtraction of the Method Control Sample value, even if the result is less than the MRL.

Oxygen free water cannot be achieved due to the nature of the matrix.

* = Coeluting compounds.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 1

Client: ALS Laboratory Group
Client Sample ID: 35BWW08.190805
Client Project ID: HS19080238 / HS19080238

ALS Project ID: P1904674
 ALS Sample ID: P1904674-001

Test Code: RSK 175
 Instrument ID: HP5890A/GC10/FID
 Analyst: Wade Henton
 Matrix: Water
 Test Notes:

Date Collected: 8/5/19
 Date Received: 8/7/19
 Date Analyzed: 8/12/19
 Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result µg/L	LOQ µg/L	LOD µg/L	MDL µg/L	Data Qualifier
74-82-8	Methane	1.0	1.3	1.0	0.51	U
74-85-1	Ethene	0.55	1.0	0.55	0.24	U
74-84-0	Ethane	0.47	0.60	0.47	0.16	U

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

Page 1 of 1

Client: ALS Laboratory Group
Client Sample ID: 35BWW04.190805
Client Project ID: HS19080238 / HS19080238

ALS Project ID: P1904674
 ALS Sample ID: P1904674-002

Test Code: RSK 175
 Instrument ID: HP5890A/GC10/FID
 Analyst: Wade Henton
 Matrix: Water
 Test Notes:

Date Collected: 8/5/19
 Date Received: 8/7/19
 Date Analyzed: 8/12/19
 Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result µg/L	LOQ µg/L	LOD µg/L	MDL µg/L	Data Qualifier
74-82-8	Methane	1.0	1.3	1.0	0.51	U
74-85-1	Ethene	0.55	1.0	0.55	0.24	U
74-84-0	Ethane	0.47	0.60	0.47	0.16	U

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

Page 1 of 1

Client: ALS Laboratory Group
Client Sample ID: 35BWW12.190805
Client Project ID: HS19080238 / HS19080238

ALS Project ID: P1904674
 ALS Sample ID: P1904674-003

Test Code: RSK 175
 Instrument ID: HP5890A/GC10/FID
 Analyst: Wade Henton
 Matrix: Water
 Test Notes:

Date Collected: 8/5/19
 Date Received: 8/7/19
 Date Analyzed: 8/12/19
 Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result µg/L	LOQ µg/L	LOD µg/L	MDL µg/L	Data Qualifier
74-82-8	Methane	1.0	1.3	1.0	0.51	U
74-85-1	Ethene	0.55	1.0	0.55	0.24	U
74-84-0	Ethane	0.47	0.60	0.47	0.16	U

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

Page 1 of 1

Client: ALS Laboratory Group
Client Sample ID: 35BWW12.190805-FD
Client Project ID: HS19080238 / HS19080238

ALS Project ID: P1904674
 ALS Sample ID: P1904674-004

Test Code: RSK 175
 Instrument ID: HP5890A/GC10/FID
 Analyst: Wade Henton
 Matrix: Water
 Test Notes:

Date Collected: 8/5/19
 Date Received: 8/7/19
 Date Analyzed: 8/12/19
 Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result µg/L	LOQ µg/L	LOD µg/L	MDL µg/L	Data Qualifier
74-82-8	Methane	1.0	1.3	1.0	0.51	U
74-85-1	Ethene	0.55	1.0	0.55	0.24	U
74-84-0	Ethane	0.47	0.60	0.47	0.16	U

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

Page 1 of 1

Client: ALS Laboratory Group
Client Sample ID: Method Control Sample
Client Project ID: HS19080238 / HS19080238

ALS Project ID: P1904674
 ALS Sample ID: P190812-MB

Test Code: RSK 175
 Instrument ID: HP5890A/GC10/FID
 Analyst: Wade Henton
 Matrix: Water
 Test Notes:

Date Collected: NA
 Date Received: NA
 Date Analyzed: 8/12/19
 Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result µg/L	LOQ µg/L	LOD µg/L	MDL µg/L	Data Qualifier
74-82-8	Methane	1.0	1.3	1.0	0.51	U
74-85-1	Ethene	0.55	1.0	0.55	0.24	U
74-84-0	Ethane	0.47	0.60	0.47	0.16	U

The Method Control Sample is laboratory water carried through the entire analytical process.

U = Compound was analyzed for, but not detected above the laboratory detection limit.

LOQ = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

LABORATORY CONTROL SAMPLE / DUPLICATE LABORATORY CONTROL SAMPLE SUMMARY

Page 1 of 1

Client: ALS Laboratory Group
Client Sample ID: Duplicate Lab Control Sample
Client Project ID: HS19080238 / HS19080238

ALS Project ID: P1904674
 ALS Sample ID: P190812-LCS
 P190812-DLCS

Test Code: RSK 175
 Instrument ID: HP5890A/GC10/FID
 Analyst: Wade Henton
 Matrix: Water
 Test Notes:

Date Collected: NA
 Date Received: NA
 Date Analyzed: 8/12/19
 Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Spike Amount	Result ₁		% Recovery		DOD	RPD	RPD	Data
		LCS / DLCS µg/L	LCS µg/L	DLCS µg/L	LCS	DLCS	Acceptance Limits			
74-82-8	Methane	2.52	2.55	2.41	101	96	73-125	5	26	
74-85-1	Ethene	4.40	4.41	4.42	100	100	72-133	0	11	
74-84-0	Ethane	4.72	4.56	4.72	97	100	74-131	3	10	

₁ = The concentration shown includes a subtraction of the Method Control Sample value, even if the result is less than the MRL.

Data Path : J:\GC10\DATA\RSK_FID\2019_08\13CO2\
 Data File : 08131907.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 13-Aug-2019, 13:56:48
 Operator : WH
 Sample : p1904674-001 0.1ml
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Aug 13 14:08:08 2019
 Quant Method : I:\GC10\METHODS\RS082817_CO2.M
 Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 QLast Update : Tue Aug 29 16:13:13 2017
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :

Compound	R.T.	Response	Conc	Units

Target Compounds				
1) Oxygen/Argon	1.974f	353249	0.074	ppm
2) Carbon monoxide	1.974f	353249	N.D.	ppm
3) Methane (TCD)	0.000	0	N.D.	ppm
4) Carbon dioxide	6.077	159657	680.175	ppm
6) Methane (FID)	0.000	0	N.D.	ppm
7) Ethylene	0.000	0	N.D.	ppm
8) Ethane	0.000	0	N.D.	ppm
9) Propylene	0.000	0	N.D.	ppm
10) Propane	0.000	0	N.D.	ppm
11) Isobutylene	0.000	0	N.D.	ppm
12) Isobutane	0.000	0	N.D.	ppm
13) n-Butane	0.000	0	N.D.	ppm

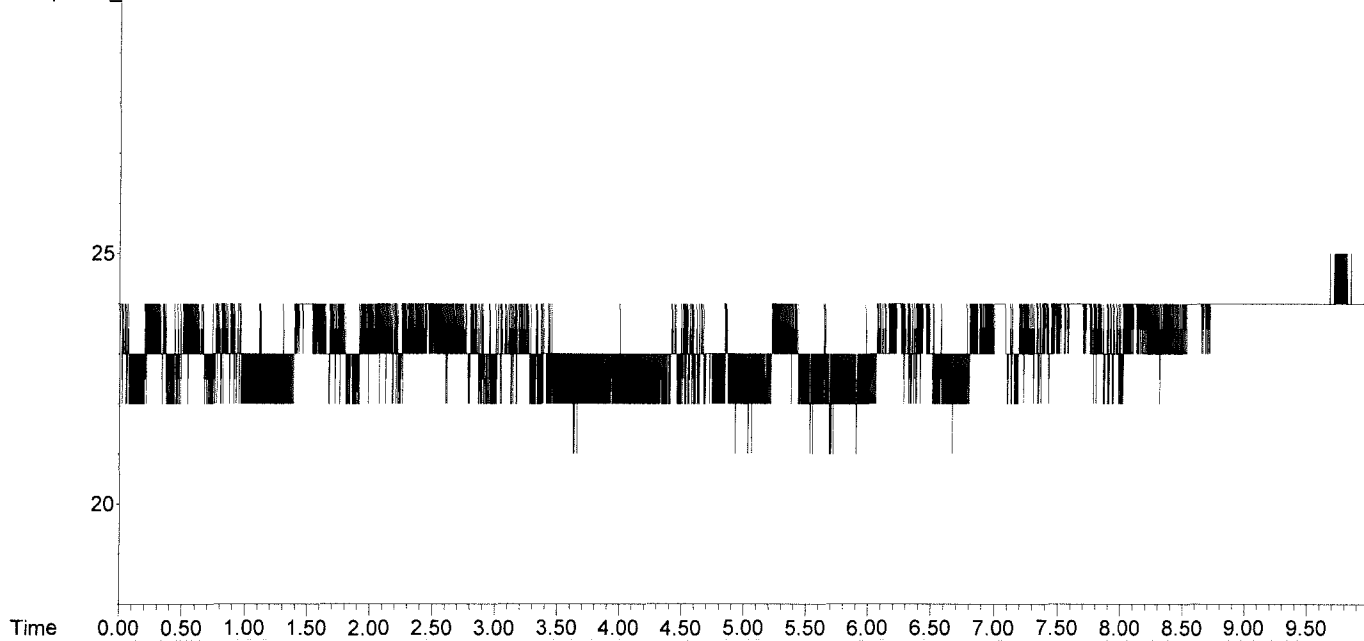
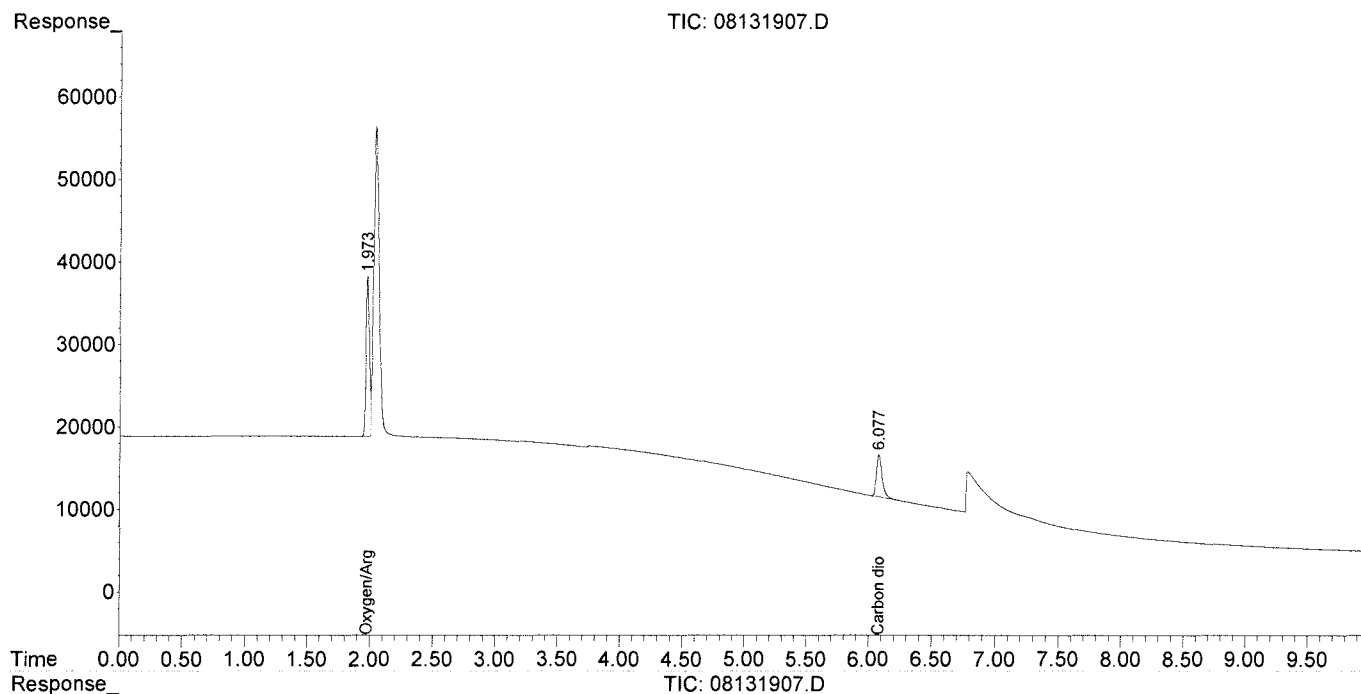
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2019_08\13CO2\
 Data File : 08131907.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 13-Aug-2019, 13:56:48
 Operator : WH
 Sample : p1904674-001 0.1ml
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Aug 13 14:08:08 2019
 Quant Method : I:\GC10\METHODS\RS082817_CO2.M
 Quant Title : RSK175, VOA-DISGAS, VOA-T03C1C6
 QLast Update : Tue Aug 29 16:13:13 2017
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :



Data Path : J:\GC10\DATA\RSK_FID\2019_08\13CO2\
 Data File : 08131908.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 13-Aug-2019, 14:13:47
 Operator : WH
 Sample : p1904674-002 0.1ml
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Aug 13 14:31:43 2019
 Quant Method : I:\GC10\METHODS\RS082817_CO2.M
 Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 QLast Update : Tue Aug 29 16:13:13 2017
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Oxygen/Argon	1.964f	294462	0.062 ppm
2) Carbon monoxide	1.964f	294462	N.D. ppm
3) Methane (TCD)	0.000	0	N.D. ppm
4) Carbon dioxide	6.022	3044079	12968.472 ppm
6) Methane (FID)	0.000	0	N.D. ppm
7) Ethylene	0.000	0	N.D. ppm
8) Ethane	0.000	0	N.D. ppm
9) Propylene	0.000	0	N.D. ppm
10) Propane	0.000	0	N.D. ppm
11) Isobutylene	0.000	0	N.D. ppm
12) Isobutane	0.000	0	N.D. ppm
13) n-Butane	0.000	0	N.D. ppm

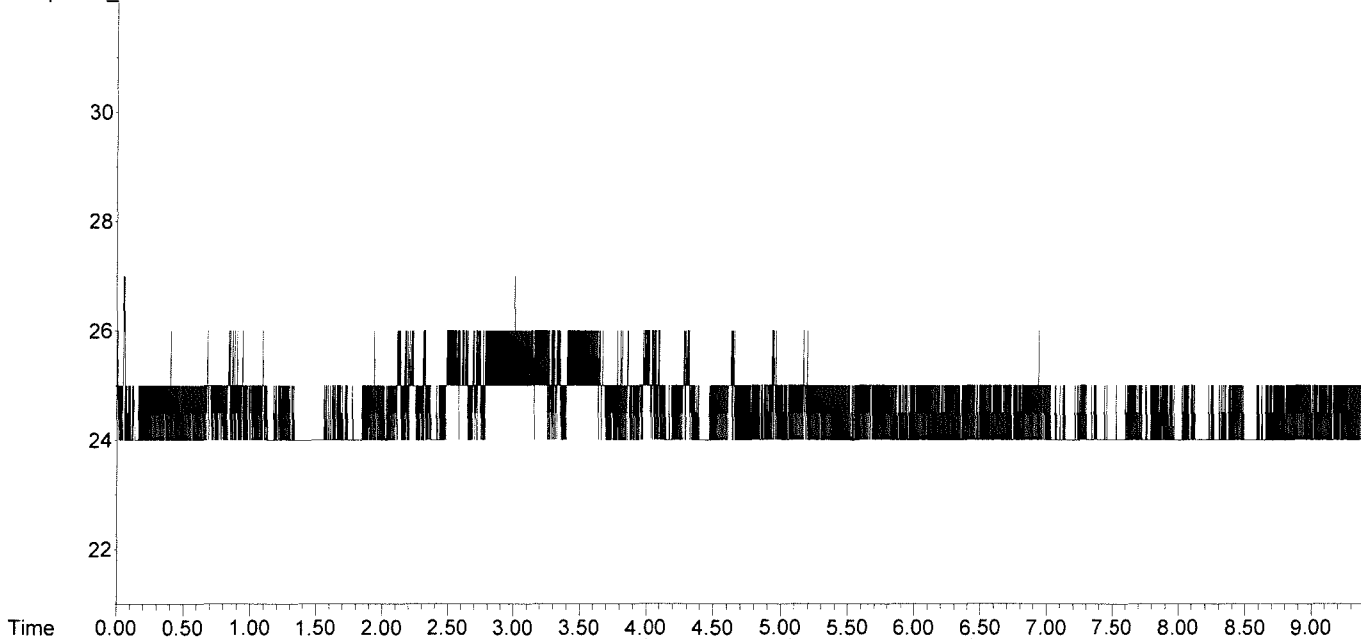
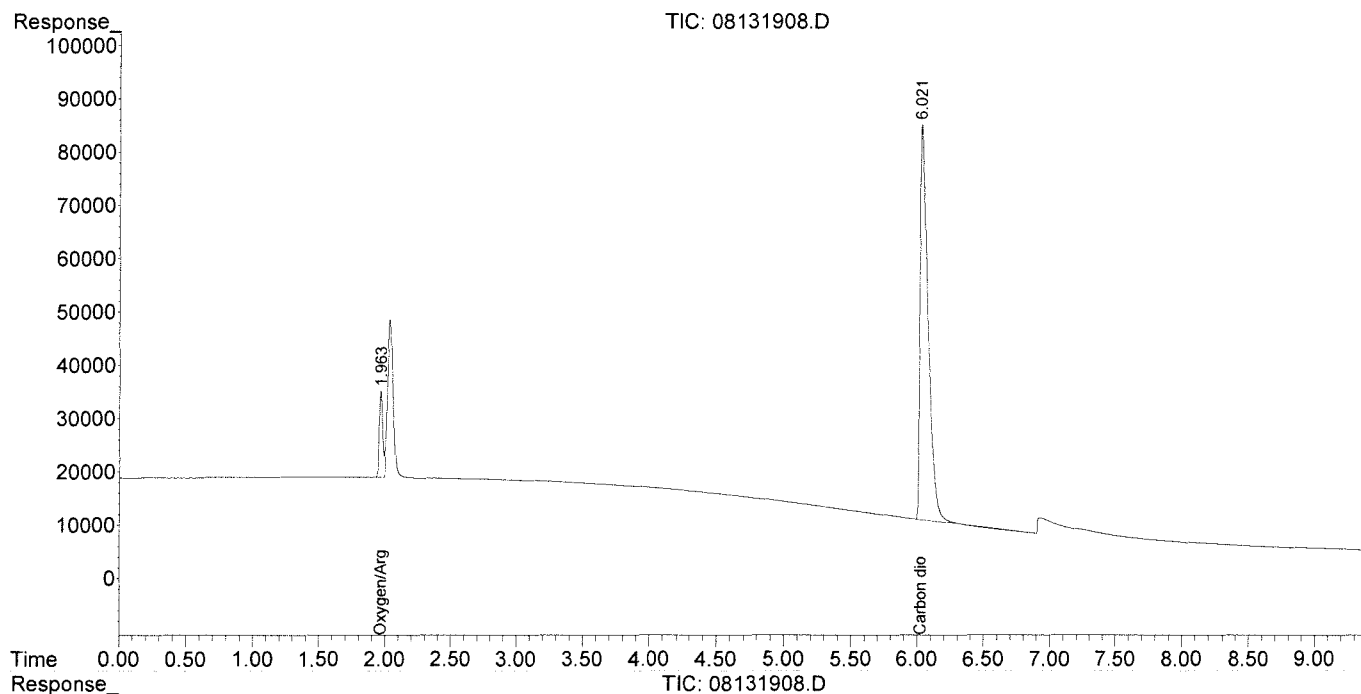
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2019_08\13CO2\
 Data File : 08131908.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 13-Aug-2019, 14:13:47
 Operator : WH
 Sample : p1904674-002 0.1ml
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Aug 13 14:31:43 2019
 Quant Method : I:\GC10\METHODS\RS082817_CO2.M
 Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 QLast Update : Tue Aug 29 16:13:13 2017
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :



Data Path : J:\GC10\DATA\RSK_FID\2019_08\13CO2\
 Data File : 08131909.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 13-Aug-2019, 14:26:54
 Operator : WH
 Sample : p1904674-003 0.1ml
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Aug 13 14:47:26 2019
 Quant Method : I:\GC10\METHODS\RS082817_CO2.M
 Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 QLast Update : Tue Aug 29 16:13:13 2017
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :

Compound	R.T.	Response	Conc	Units

Target Compounds				
1) Oxygen/Argon	1.972f	337111	0.071	ppm
2) Carbon monoxide	1.972f	337111	N.D.	ppm
3) Methane (TCD)	0.000	0	N.D.	ppm
4) Carbon dioxide	6.043	1529859	6517.551	ppm
6) Methane (FID)	0.000	0	N.D.	ppm
7) Ethylene	0.000	0	N.D.	ppm
8) Ethane	0.000	0	N.D.	ppm
9) Propylene	0.000	0	N.D.	ppm
10) Propane	0.000	0	N.D.	ppm
11) Isobutylene	0.000	0	N.D.	ppm
12) Isobutane	0.000	0	N.D.	ppm
13) n-Butane	0.000	0	N.D.	ppm

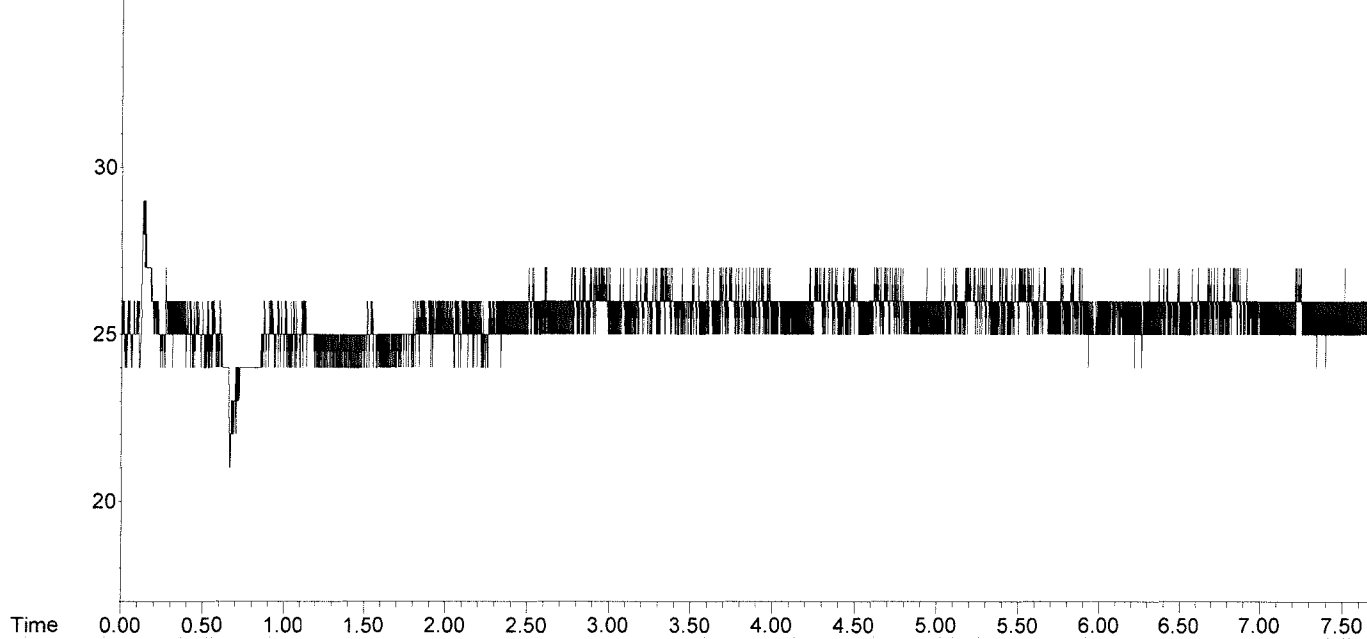
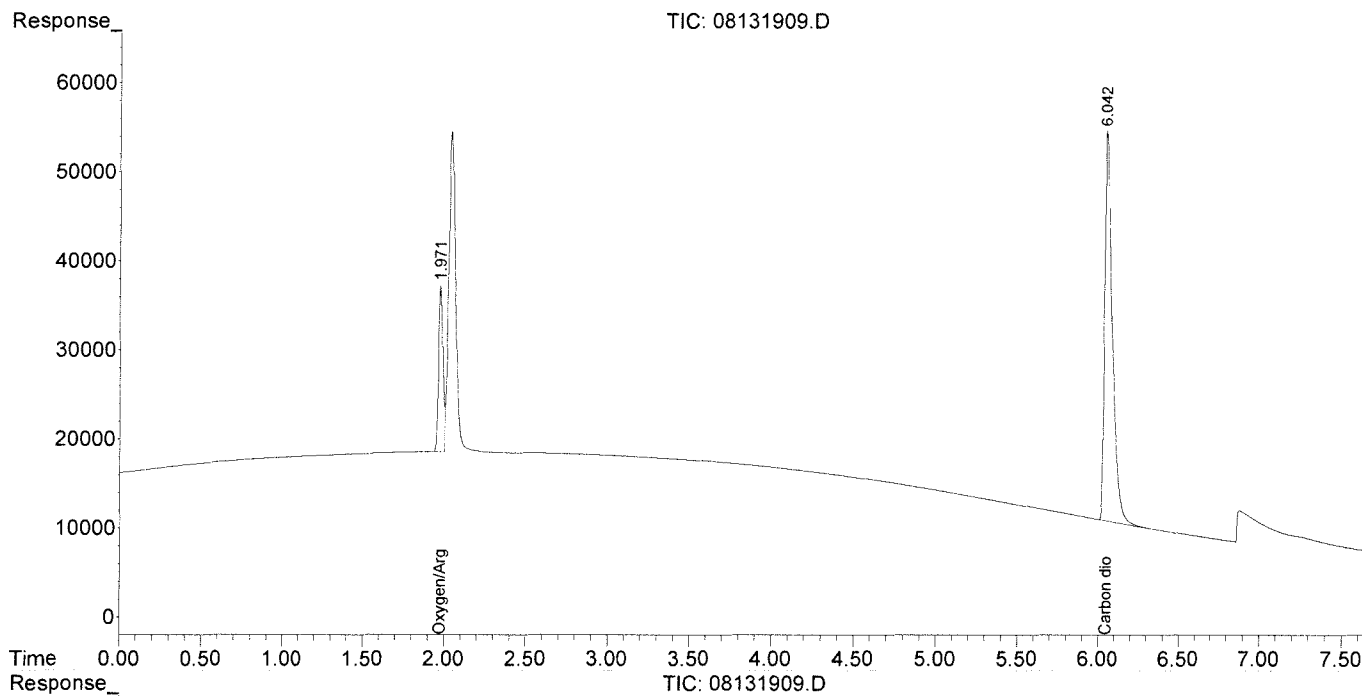
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2019_08\13CO2\
Data File : 08131909.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 13-Aug-2019, 14:26:54
Operator : WH
Sample : p1904674-003 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 13 14:47:26 2019
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



Data Path : J:\GC10\DATA\RSK_FID\2019_08\13CO2\
 Data File : 08131910.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 13-Aug-2019, 14:36:36
 Operator : WH
 Sample : p1904674-004 0.1ml
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Aug 13 15:53:42 2019
 Quant Method : I:\GC10\METHODS\RS082817_CO2.M
 Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 QLast Update : Tue Aug 29 16:13:13 2017
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :

Compound	R.T.	Response	Conc	Units

Target Compounds				
1) Oxygen/Argon	1.963f	1622378	0.341	ppm
2) Carbon monoxide	1.963f	1622378	N.D.	ppm
3) Methane (TCD)	0.000	0	N.D.	ppm
4) Carbon dioxide	6.040	1557162	6633.867	ppm
6) Methane (FID)	0.000	0	N.D.	ppm
7) Ethylene	0.000	0	N.D.	ppm
8) Ethane	0.000	0	N.D.	ppm
9) Propylene	0.000	0	N.D.	ppm
10) Propane	0.000	0	N.D.	ppm
11) Isobutylene	0.000	0	N.D.	ppm
12) Isobutane	0.000	0	N.D.	ppm
13) n-Butane	0.000	0	N.D.	ppm

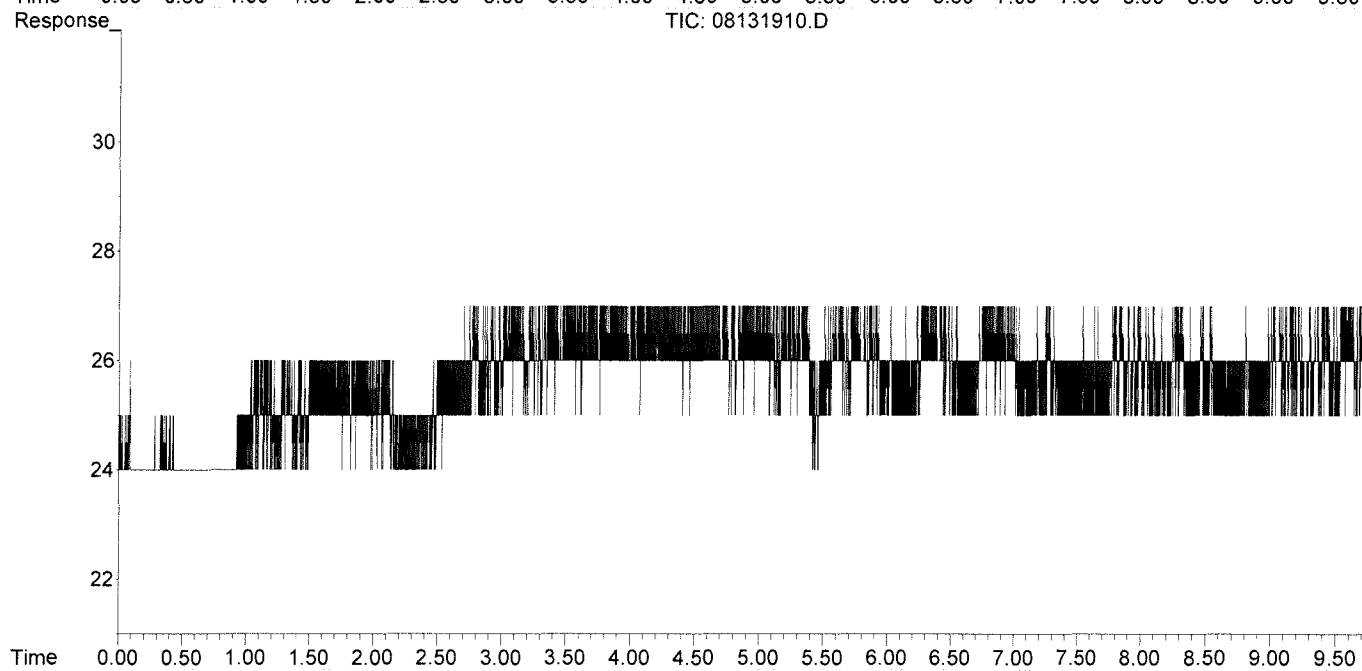
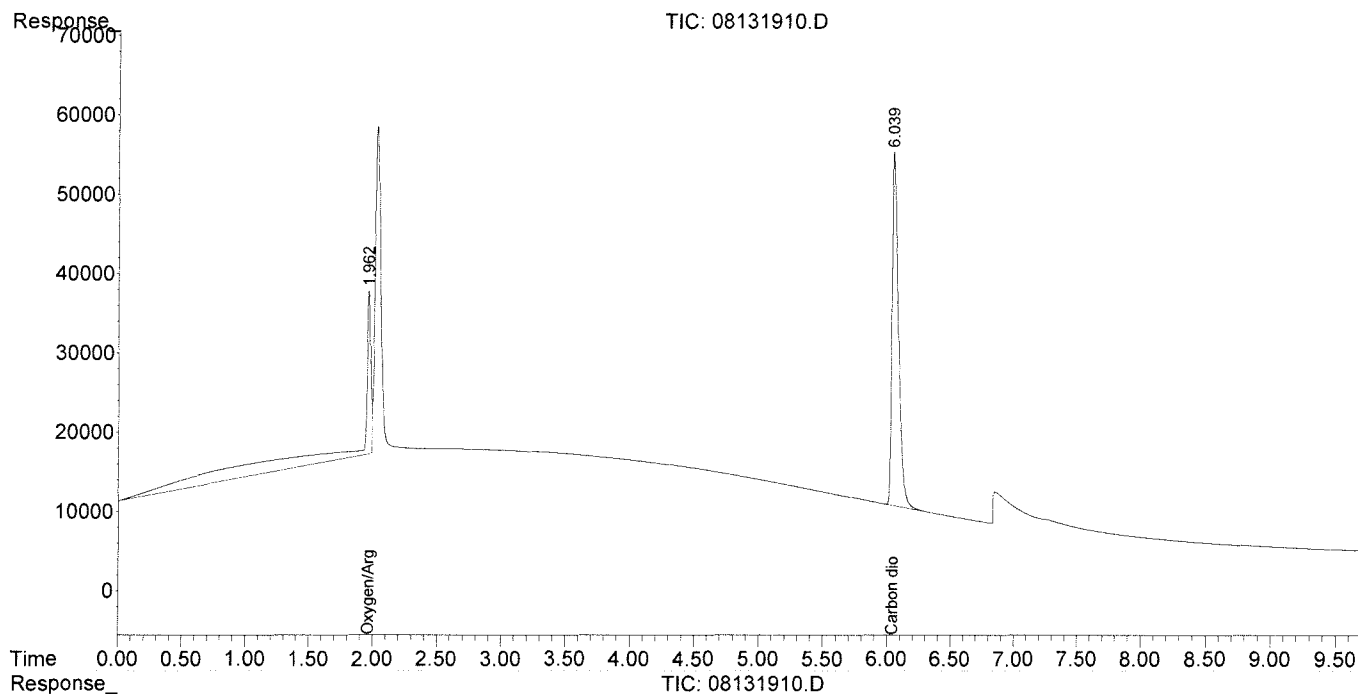
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2019_08\13CO2\
 Data File : 08131910.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 13-Aug-2019, 14:36:36
 Operator : WH
 Sample : p1904674-004 0.1ml
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Aug 13 15:53:42 2019
 Quant Method : I:\GC10\METHODS\RS082817_CO2.M
 Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 QLast Update : Tue Aug 29 16:13:13 2017
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :



Data Path : J:\GC10\DATA\RSK_FID\2019_08\13CO2\
 Data File : 08131903.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 13-Aug-2019, 12:01:26
 Operator : WH
 Sample : MCS 0.1ml
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Aug 13 12:24:01 2019
 Quant Method : I:\GC10\METHODS\RS082817_CO2.M
 Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 QLast Update : Tue Aug 29 16:13:13 2017
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :

Compound	R.T.	Response	Conc	Units

Target Compounds				
1) Oxygen/Argon	1.974f	163795	0.034	ppm
2) Carbon monoxide	1.974f	163795	N.D.	ppm
3) Methane (TCD)	0.000	0	N.D.	ppm
4) Carbon dioxide	0.000	0	N.D.	ppm
6) Methane (FID)	0.000	0	N.D.	ppm
7) Ethylene	0.000	0	N.D.	ppm
8) Ethane	0.000	0	N.D.	ppm
9) Propylene	0.000	0	N.D.	ppm
10) Propane	0.000	0	N.D.	ppm
11) Isobutylene	0.000	0	N.D.	ppm
12) Isobutane	0.000	0	N.D.	ppm
13) n-Butane	0.000	0	N.D.	ppm

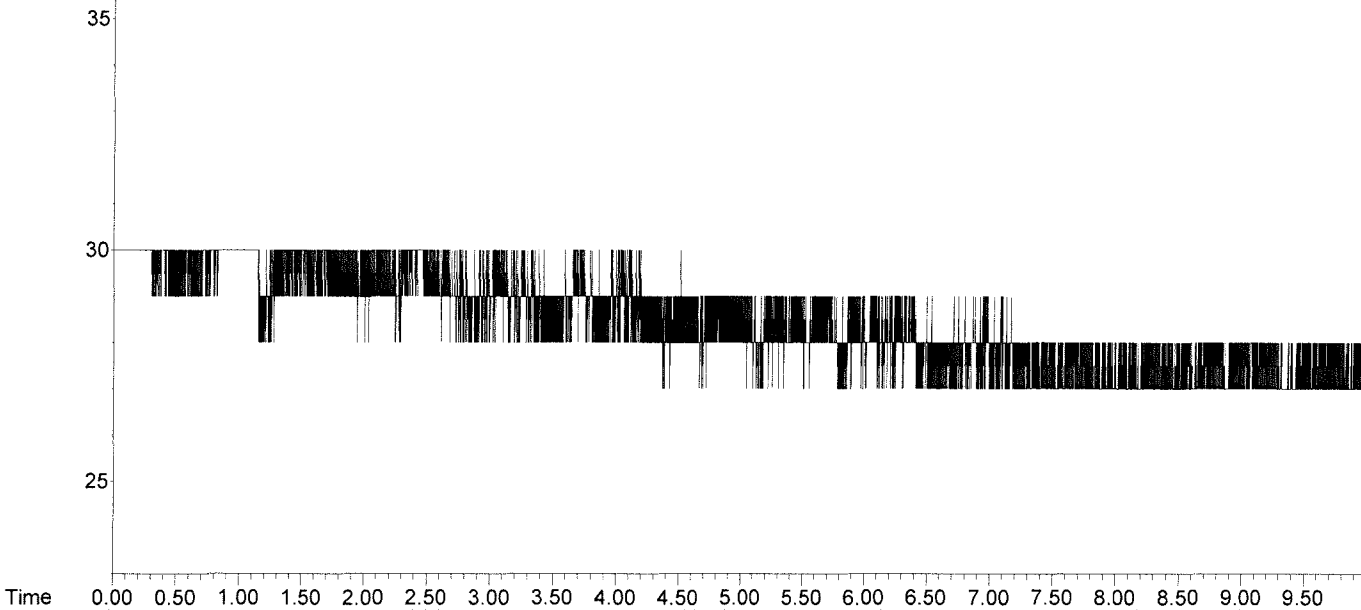
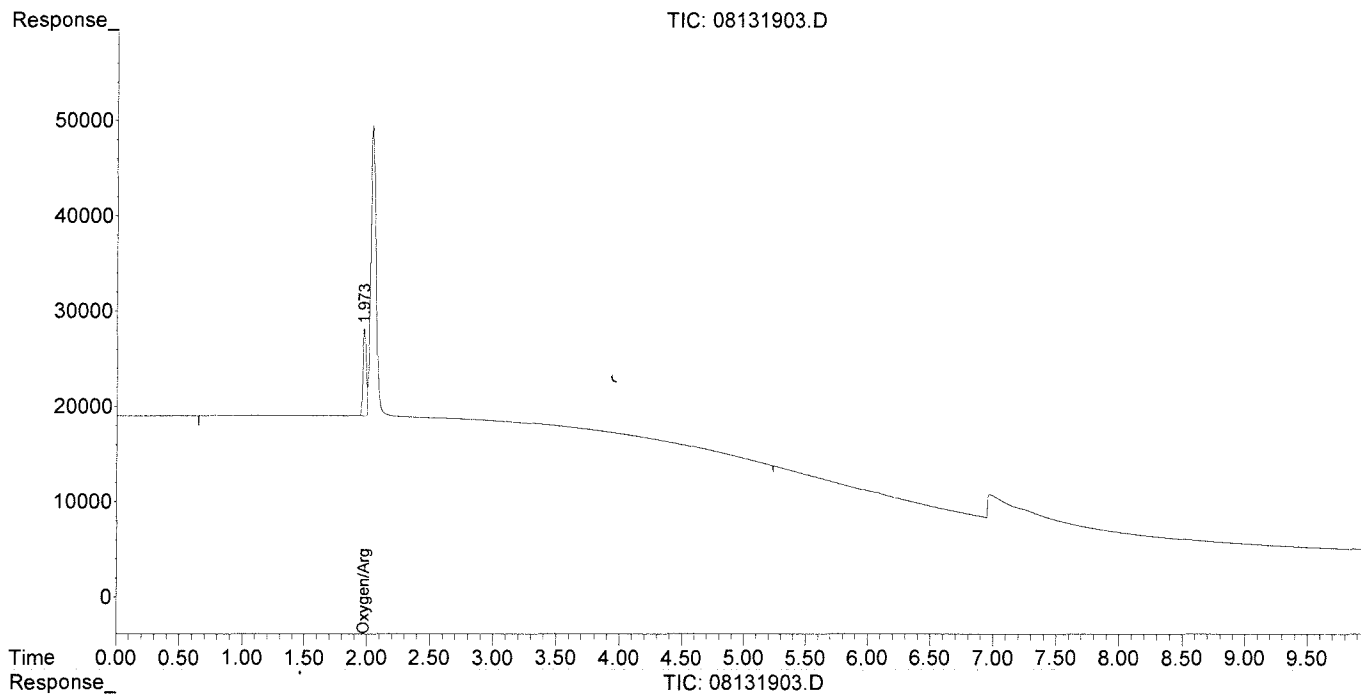
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2019_08\13CO2\
 Data File : 08131903.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 13-Aug-2019, 12:01:26
 Operator : WH
 Sample : MCS 0.1ml
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Aug 13 12:24:01 2019
 Quant Method : I:\GC10\METHODS\RS082817_CO2.M
 Quant Title : RSK175, VOA-DISGAS, VOA-T03C1C6
 QLast Update : Tue Aug 29 16:13:13 2017
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :



Data Path : J:\GC10\DATA\RSK_FID\2019_08\13CO2\
 Data File : 08131905.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 13-Aug-2019, 12:36:48
 Operator : WH
 Sample : LCS TCD
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Aug 13 12:45:59 2019
 Quant Method : I:\GC10\METHODS\RS082817_CO2.M
 Quant Title : RSK175, VOA-DISGAS, VOA-T03C1C6
 QLast Update : Tue Aug 29 16:13:13 2017
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :

Compound	R.T.	Response	Conc	Units

Target Compounds				
1) Oxygen/Argon	1.949f	1771658	0.372	ppm
2) Carbon monoxide	1.949f	1771658	N.D.	ppm
3) Methane (TCD)	0.000	0	N.D.	ppm
4) Carbon dioxide	6.075	212163	903.862	ppm m
6) Methane (FID)	0.000	0	N.D.	ppm
7) Ethylene	0.000	0	N.D.	ppm
8) Ethane	0.000	0	N.D.	ppm
9) Propylene	0.000	0	N.D.	ppm
10) Propane	0.000	0	N.D.	ppm
11) Isobutylene	0.000	0	N.D.	ppm
12) Isobutane	0.000	0	N.D.	ppm
13) n-Butane	0.000	0	N.D.	ppm

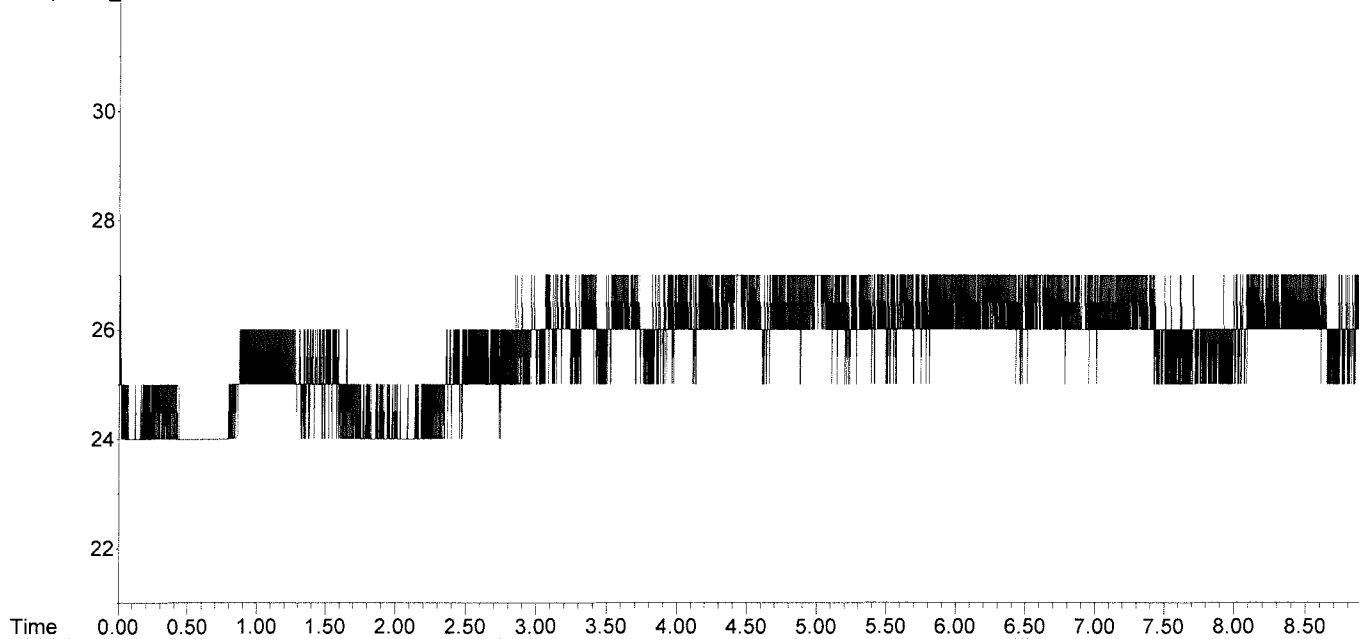
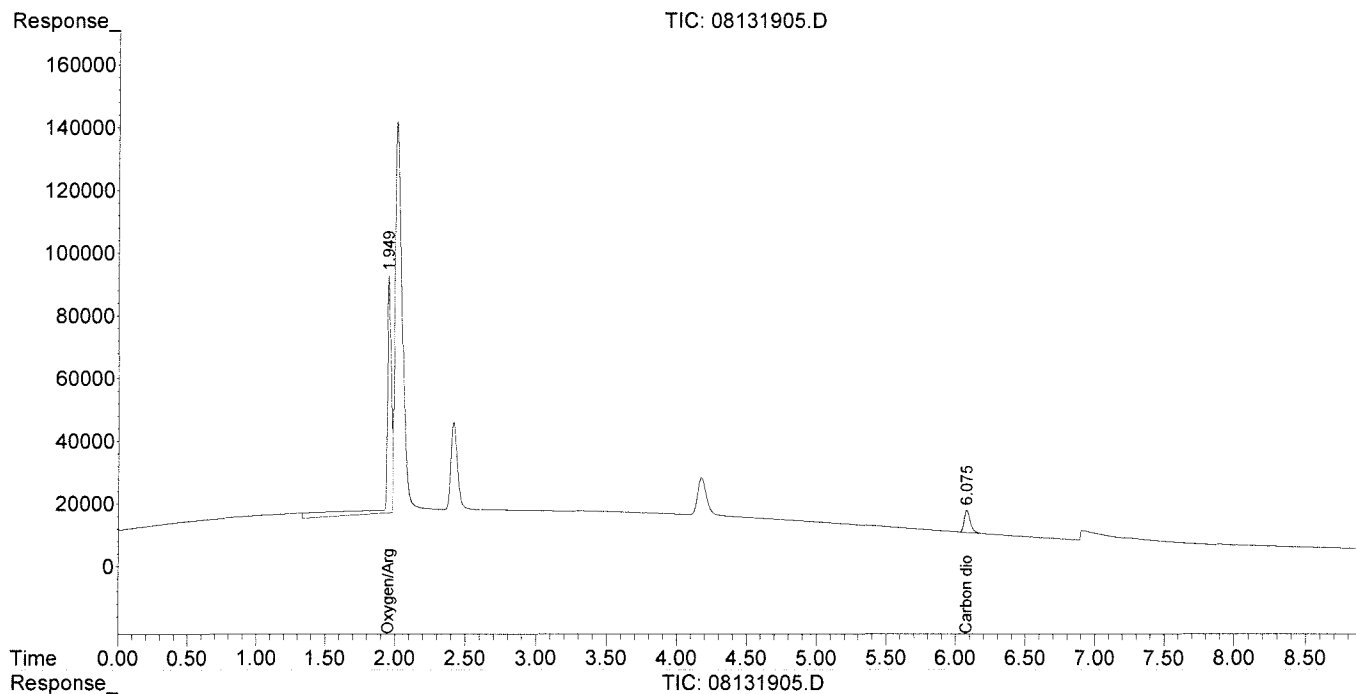
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2019_08\13CO2\
Data File : 08131905.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 13-Aug-2019, 12:36:48
Operator : WH
Sample : LCS TCD
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 13 12:45:59 2019
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-T03C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

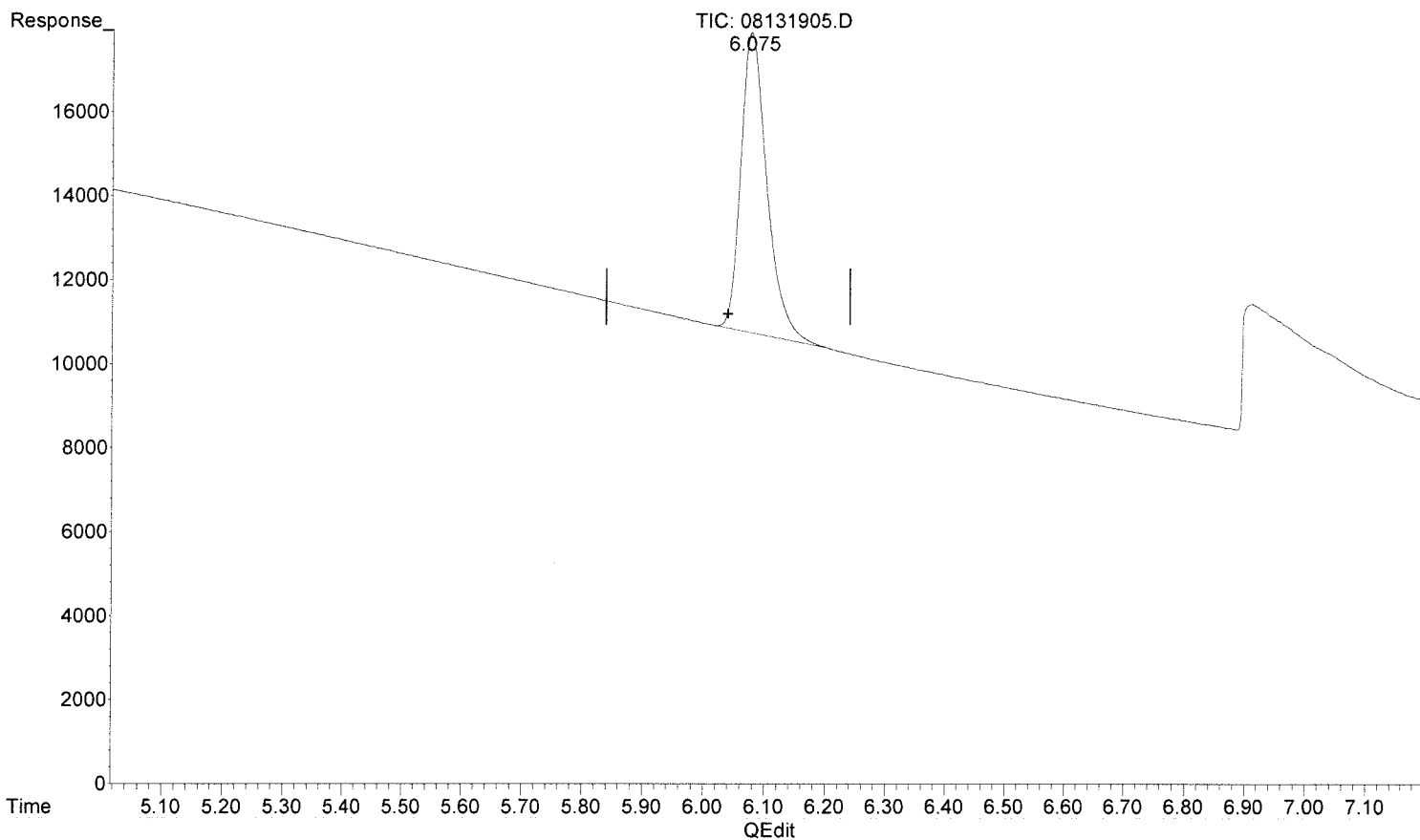
Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



Data Path : J:\GC10\DATA\RSK_FID\2019_08\13CO2\
Data File : 08131905.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 13-Aug-2019, 12:36:48
Operator : WH
Sample : LCS TCD
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 13 12:45:59 2019
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



(4) Carbon dioxide
6.075min 903.862 ppm m
response 212163

*MR
8/14/19*

*W 8/13/19
B...
no previous*

Data Path : J:\GC10\DATA\RSK_FID\2019_08\13CO2\
 Data File : 08131906.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 13-Aug-2019, 12:48:06
 Operator : WH
 Sample : LCSD TCD
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Aug 13 13:55:18 2019
 Quant Method : I:\GC10\METHODS\RS082817_CO2.M
 Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 QLast Update : Tue Aug 29 16:13:13 2017
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :

Compound	R.T.	Response	Conc	Units

Target Compounds				
1) Oxygen/Argon	1.929f	2849642	0.599	ppm
2) Carbon monoxide	1.929f	2849642	N.D.	ppm
3) Methane (TCD)	0.000	0	N.D.	ppm
4) Carbon dioxide	6.066	214633	914.386	ppm m
6) Methane (FID)	0.000	0	N.D.	ppm
7) Ethylene	0.000	0	N.D.	ppm
8) Ethane	0.000	0	N.D.	ppm
9) Propylene	0.000	0	N.D.	ppm
10) Propane	0.000	0	N.D.	ppm
11) Isobutylene	0.000	0	N.D.	ppm
12) Isobutane	0.000	0	N.D.	ppm
13) n-Butane	0.000	0	N.D.	ppm

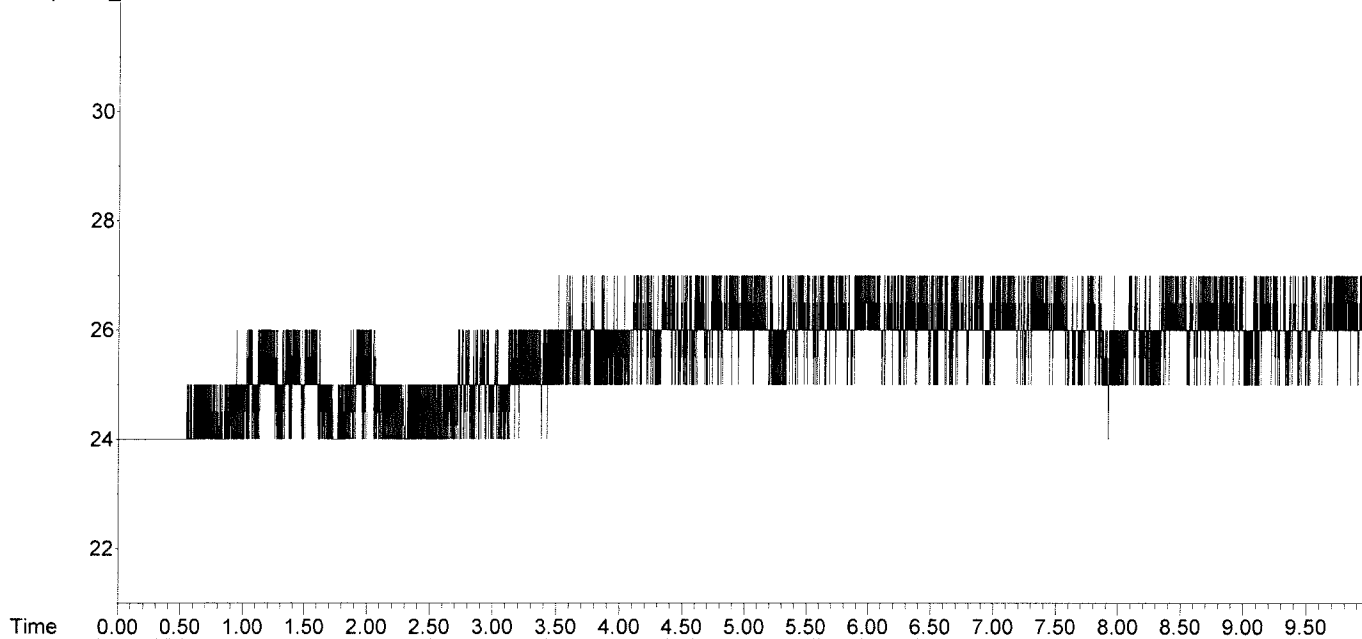
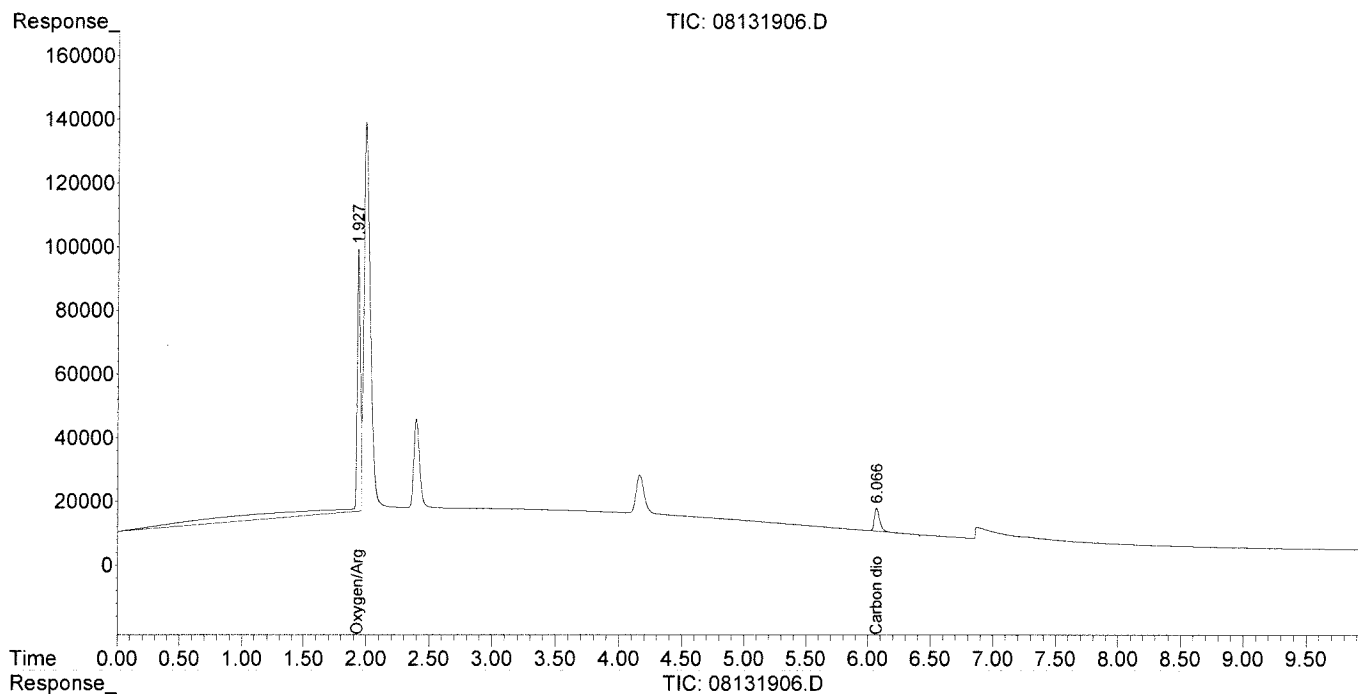
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2019_08\13CO2\
Data File : 08131906.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 13-Aug-2019, 12:48:06
Operator : WH
Sample : LCSD TCD
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 13 13:55:18 2019
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

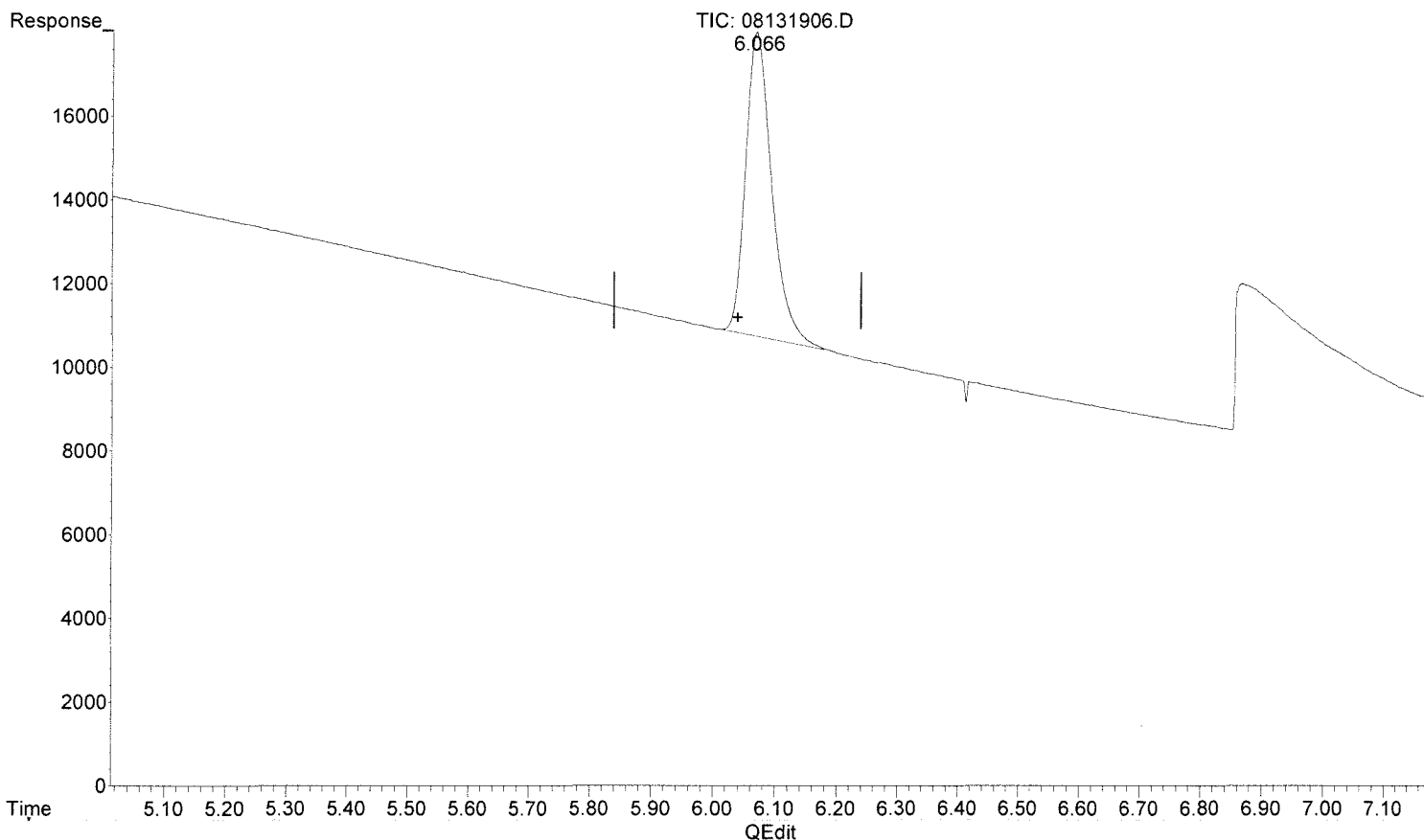
Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



Data Path : J:\GC10\DATA\RSK_FID\2019_08\13CO2\
Data File : 08131906.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 13-Aug-2019, 12:48:06
Operator : WH
Sample : LCSD TCD
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 13 13:55:18 2019
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



(4) Carbon dioxide
6.066min 914.386 ppm m
response 214633

MR 8/14/19 *low 8/13/19*
BLE *no previous*

Method Path : I:\GC10\METHODS\
 Method File : RS082817_CO2.M
 Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 Last Update : Tue Aug 29 16:13:13 2017
 Response Via : Initial Calibration

Calibration Files

1 =08291715.D 2 =08291716.D 3 =08291717.D
 4 =08291719.D 5 =08291720.D 6 =08291721.D

Compound	1	2	3	4	5	6	Avg	%RSD
1) Oxygen/Argon	4.760						4.760 E6	0.00
2) Carbon monoxide	2.775		1.066	0.043	0.033	0.027	0.657 E6	170.12
3) Methane (TCD)							9.457	0.00
4) Carbon dioxide	2.717	2.193	2.338	2.272	2.265	2.298	2.347 E2	7.99

Signal #2 Calibration Files

1 =08291715.D 2 =08291716.D 3 =08291717.D
 4 =08291719.D 5 =08291720.D 6 =08291721.D

Compound	1	2	3	4	5	6	Avg	%RSD
6) Methane (FID)	1.253	1.160	1.005	0.927	0.848	0.848	0.945 E4	15.85
7) Ethylene	1.677	1.605	1.900	1.749	1.597	1.579	1.684 E4	7.30
8) Ethane	1.769	1.631	1.866	1.767	1.639	1.667	1.723 E4	5.40
9) Propylene	2.402	2.309	2.767	2.551	2.331	2.333	2.449 E4	7.32
10) Propane	2.906	2.737	2.817	2.639	2.410	2.420	2.655 E4	7.75
11) Isobutylene							0.000	-1.00
12) Isobutane							0.000	-1.00
13) n-Butane							0.000	-1.00

(#) = Out of Range ### Number of calibration levels exceeded format ###

RS082817_CO2.M Wed Aug 30 13:24:19 2017

dit Compounds: -- Compound #4 -- Carbon dioxide

Find Compound

Search by: Ret Time Name Calibration User-Defined Advanced Reporting

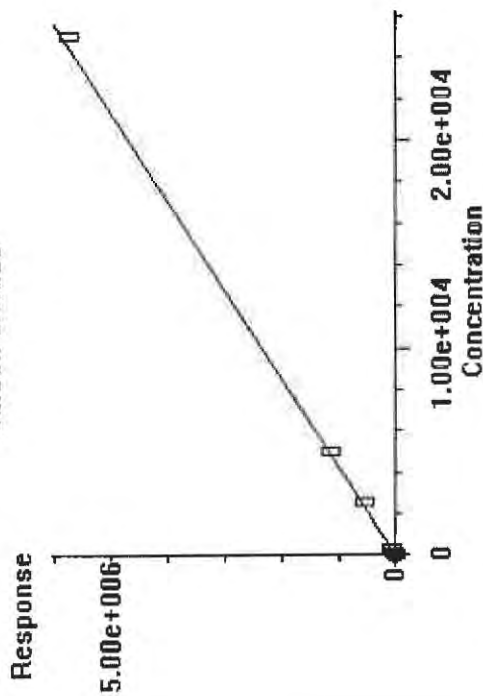
Compound Database
External Standard Compound

- Oxygen/Argon
- Carbon monoxide
- Methane (TCD)
- Carbon dioxide
- Signal #2
- Methane (FID)
- Ethylene
- Ethane
- Propylene
- Propane
- Isobutylene
- Isobutane
- n-Butane

Index

Lvl ID	Concentration	Response	Lvl ID	Concentration	Response
1	25.000000	6793.665186			
2	100.000000	21932.418000			
3	250.000000	58460.642510			
4	2500.000000	568043.388750			
5	5000.000000	1132363.215937			
6	25000.000000	5744294.891563			
7	25000.000000				
8	25000.000000				
9	2000.000000				
10	30000.000000				

Carbon dioxide



0.000e+000	Quadratic term
2.347e+002	Linear term
0.000e+000	Constant term
7.987%	RF Rel Std Dev

OK

Cancel

Help

Print Calibration Curve

Copy Calibration Curve

Method Path : I:\GC10\METHODS\
 Method File : RS082817_CO2.M
 Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 Last Update : Tue Aug 29 16:13:13 2017
 Response Via : Initial Calibration

#	ID	Conc	ISTD Conc	Path\File
1	1	0	0	J:\GC10\DATA\RSK_FID\2017_08\29\08291715.D
2	2	0	0	J:\GC10\DATA\RSK_FID\2017_08\29\08291716.D
3	3	3	0	J:\GC10\DATA\RSK_FID\2017_08\29\08291717.D
4	4	10	0	J:\GC10\DATA\RSK_FID\2017_08\29\08291719.D
5	5	25	0	J:\GC10\DATA\RSK_FID\2017_08\29\08291720.D
6	6	125	0	J:\GC10\DATA\RSK_FID\2017_08\29\08291721.D
7	7	5000	0	J:\GC10\DATA\RSK_FID\2017_08\24\08241708.D
8	8	25000	0	J:\GC10\DATA\RSK_FID\2017_08\24\08241709.D
9	9	2000	0	J:\GC10\DATA\RSK_FID\2017_08\24\08241710.D
10	10	30000	0	J:\GC10\DATA\RSK_FID\2017_08\24\08241711.D

#	ID	Update Time	Quant Time	Acquisition Time
1	1	Aug 29 14:21 2017	Aug 29 14:20 2017	29-Aug-2017, 14:07
2	2	Aug 29 14:52 2017	Aug 29 14:51 2017	29-Aug-2017, 14:22
3	3	Aug 29 15:04 2017	Aug 29 15:04 2017	29-Aug-2017, 14:53
4	4	Aug 29 15:36 2017	Aug 29 15:36 2017	29-Aug-2017, 15:23
5	5	Aug 29 15:57 2017	Aug 29 15:57 2017	29-Aug-2017, 15:44
6	6	Aug 29 16:13 2017	Aug 29 16:13 2017	29-Aug-2017, 16:00
7	7	Aug 25 09:05 2017	Aug 24 16:00 2017	24-Aug-2017, 15:44
8	8	Aug 25 09:06 2017	Aug 24 16:13 2017	24-Aug-2017, 16:02
9	9	Aug 25 09:06 2017	Aug 24 16:31 2017	24-Aug-2017, 16:16
10	10	Aug 25 09:07 2017	Aug 24 16:42 2017	24-Aug-2017, 16:33

RS082817_CO2.M Wed Aug 30 13:24:30 2017

Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
 Data File : 08291715.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 29-Aug-2017, 14:07
 Operator : MC
 Sample : 25ppm s32-08291701 0.25ml
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Aug 29 14:20:06 2017
 Quant Method : I:\GC10\METHODS\RS082417.M
 Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 QLast Update : Fri Aug 25 09:19:14 2017
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :

Compound	R.T.	Response	Conc	Units

Target Compounds				
1) Oxygen/Argon	0.000	0	N.D.	ppm d
2) Carbon monoxide	1.776	277465	N.D.	ppm
3) Methane (TCD)	0.000	0	N.D.	ppm
4) Carbon dioxide	5.978	6794	27.870	ppm m
6) Methane (FID)	0.000	0	N.D.	ppm d
7) Ethylene	0.000	0	N.D.	ppm
8) Ethane	0.000	0	N.D.	ppm
9) Propylene	0.000	0	N.D.	ppm
10) Propane	0.000	0	N.D.	ppm
11) Isobutylene	0.000	0	N.D.	ppm
12) Isobutane	0.000	0	N.D.	ppm
13) n-Butane	0.000	0	N.D.	ppm

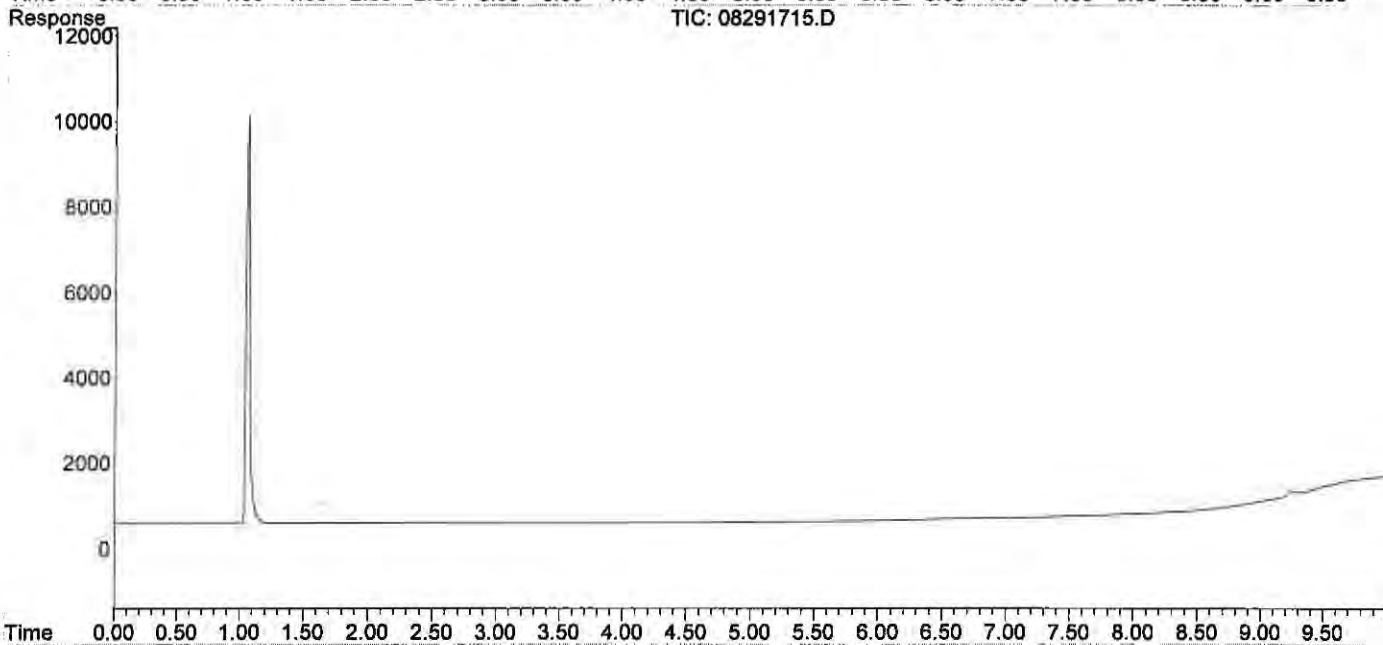
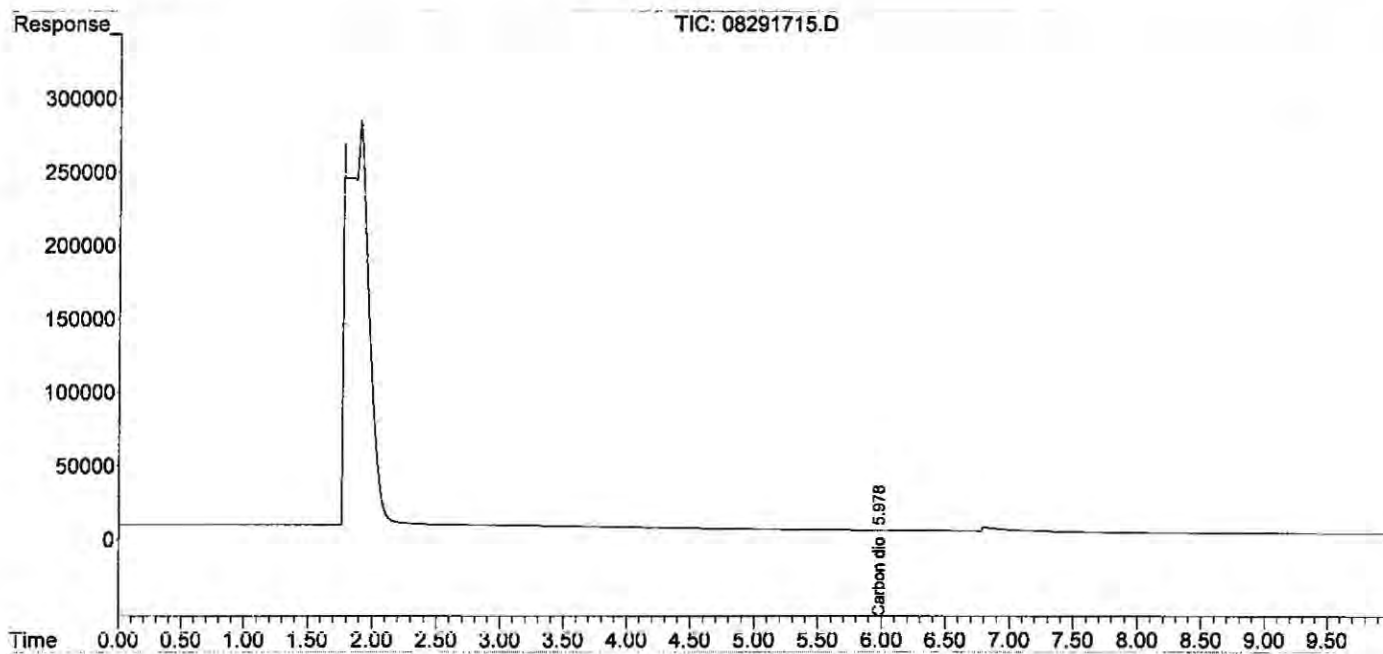
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
 Data File : 08291715.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 29-Aug-2017, 14:07
 Operator : MC
 Sample : 25ppm s32-08291701 0.25ml
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Aug 29 14:20:06 2017
 Quant Method : I:\GC10\METHODS\RS082417.M
 Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 QLast Update : Fri Aug 25 09:19:14 2017
 Response via : Initial Calibration
 Integrator: ChemStation

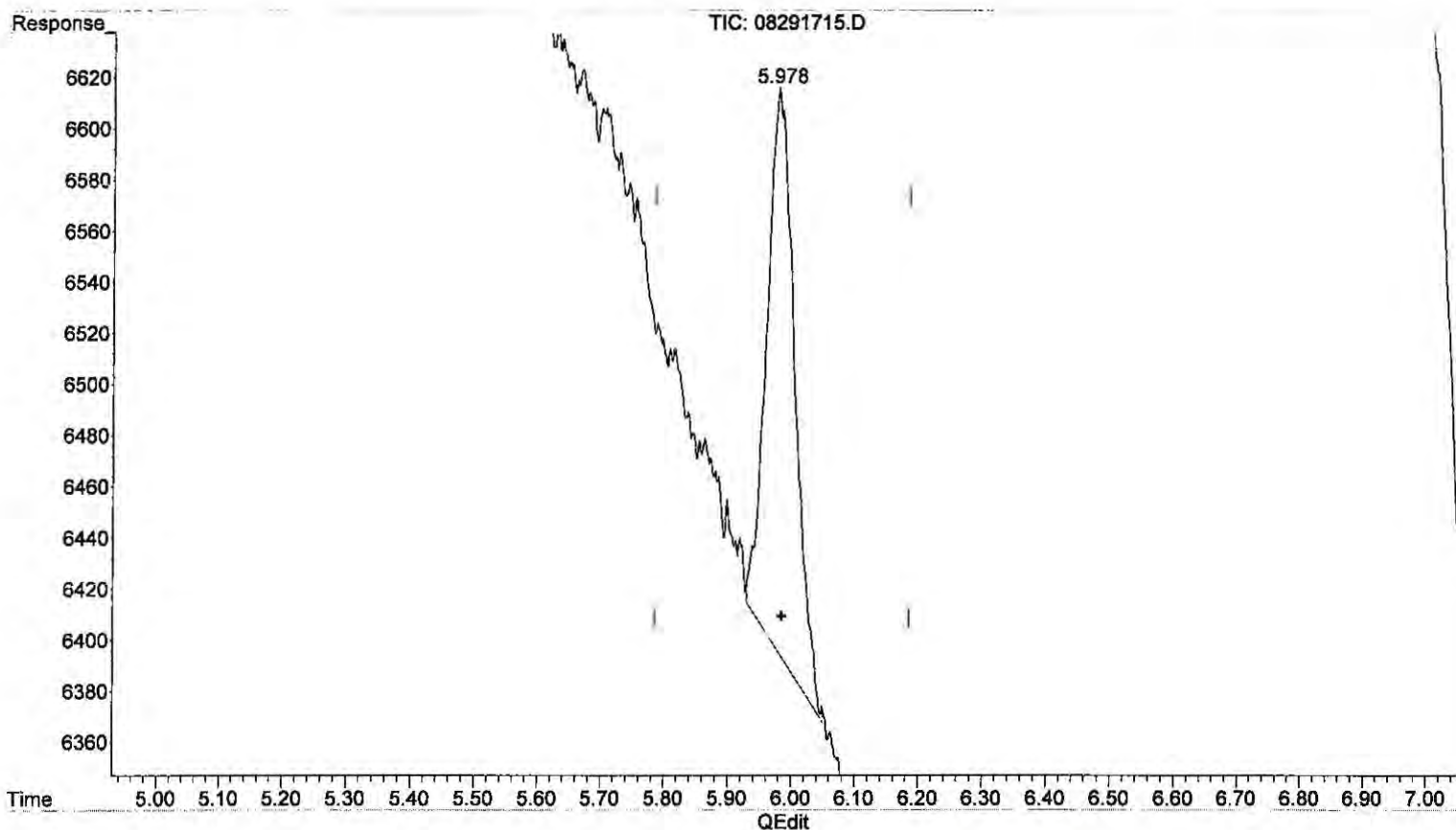
Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :



Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
 Data File : 08291715.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 29-Aug-2017, 14:07
 Operator : MC
 Sample : 25ppm s32-08291701 0.25ml
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Aug 29 14:20:06 2017
 Quant Method : I:\GC10\METHODS\RS082417.M
 Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 QLast Update : Fri Aug 25 09:19:14 2017
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :



(4) Carbon dioxide
 5.978min 27.870 ppm m
 response 6794

Handwritten notes:
 Mc 8/30/17
 BL
 M
 prw

Handwritten note:
 Mc 8/14/17

Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
 Data File : 08291716.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 29-Aug-2017, 14:22
 Operator : MC
 Sample : 100ppm s32-08291702 0.2ml
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Aug 29 14:51:38 2017
 Quant Method : I:\GC10\METHODS\RS082817_CO2.M
 Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 QLast Update : Tue Aug 29 14:21:08 2017
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :

Compound	R.T.	Response	Conc	Units
Target Compounds				
1) Oxygen/Argon	1.790	-598962	N.D.	ppm
2) Carbon monoxide	0.000	0	N.D.	ppm d
3) Methane (TCD)	0.000	0	N.D.	ppm
4) Carbon dioxide	5.978	21932	87.858	ppm
6) Methane (FID)	0.000	0	N.D.	ppm d
7) Ethylene	0.000	0	N.D.	ppm
8) Ethane	0.000	0	N.D.	ppm
9) Propylene	0.000	0	N.D.	ppm
10) Propane	0.000	0	N.D.	ppm
11) Isobutylene	0.000	0	N.D.	ppm
12) Isobutane	0.000	0	N.D.	ppm
13) n-Butane	0.000	0	N.D.	ppm

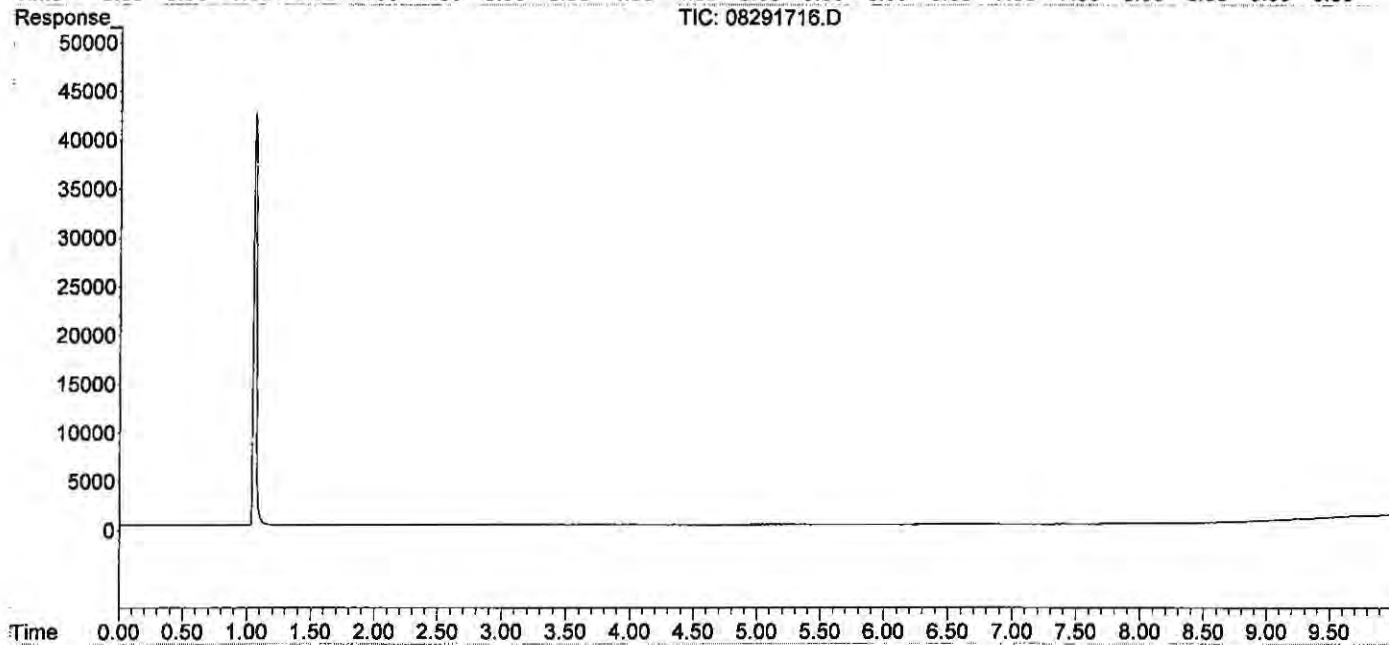
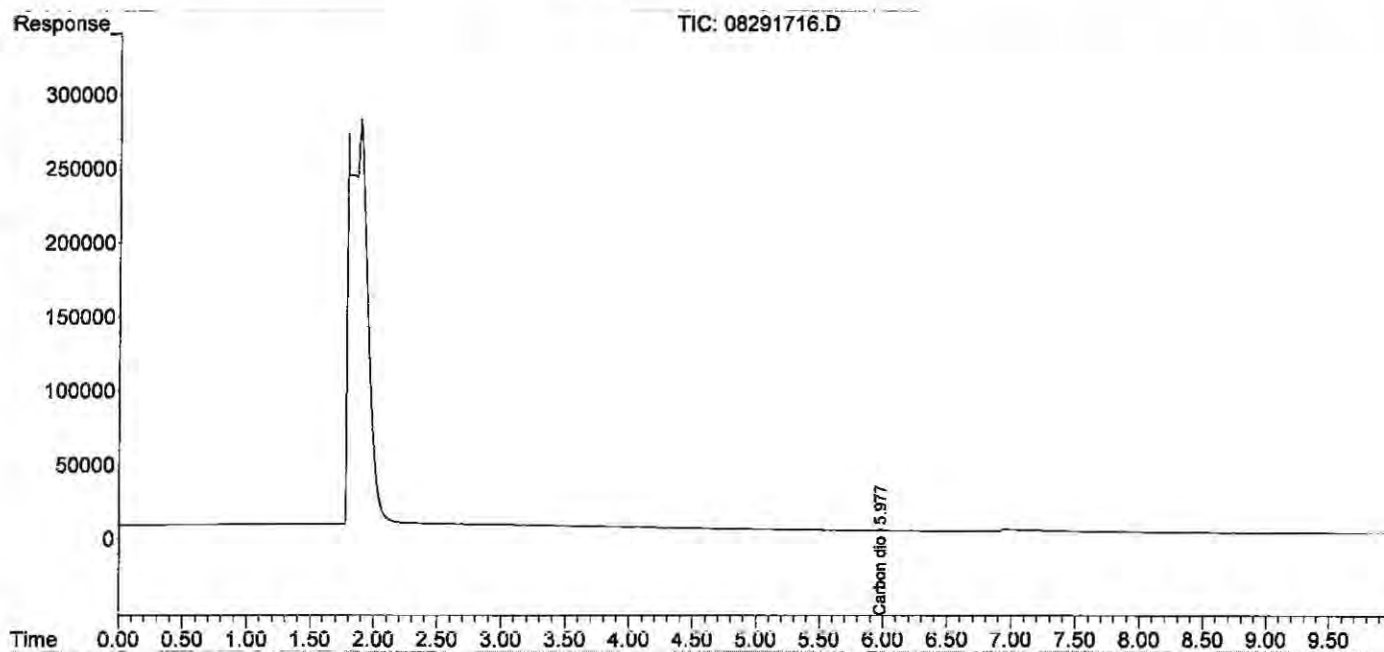
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
 Data File : 08291716.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 29-Aug-2017, 14:22
 Operator : MC
 Sample : 100ppm s32-08291702 0.2ml
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Aug 29 14:51:38 2017
 Quant Method : I:\GC10\METHODS\RS082817_CO2.M
 Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 QLast Update : Tue Aug 29 14:21:08 2017
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :



Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
 Data File : 08291717.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 29-Aug-2017, 14:53
 Operator : MC
 Sample : 250ppm s32-08291702 0.5ml
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Aug 29 15:03:42 2017
 Quant Method : I:\GC10\METHODS\RS082817_CO2.M
 Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 QLast Update : Tue Aug 29 14:52:06 2017
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :

Compound	R.T.	Response	Conc	Units

Target Compounds				
1) Oxygen/Argon	1.920f	-30716454	N.D.	ppm
2) Carbon monoxide	0.000	0	N.D.	ppm d
3) Methane (TCD)	0.000	0	N.D.	ppm d
4) Carbon dioxide	5.970	58461	240.204	ppm m
6) Methane (FID)	0.000	0	N.D.	ppm d
7) Ethylene	0.000	0	N.D.	ppm
8) Ethane	0.000	0	N.D.	ppm
9) Propylene	0.000	0	N.D.	ppm
10) Propane	0.000	0	N.D.	ppm
11) Isobutylene	0.000	0	N.D.	ppm
12) Isobutane	0.000	0	N.D.	ppm
13) n-Butane	0.000	0	N.D.	ppm

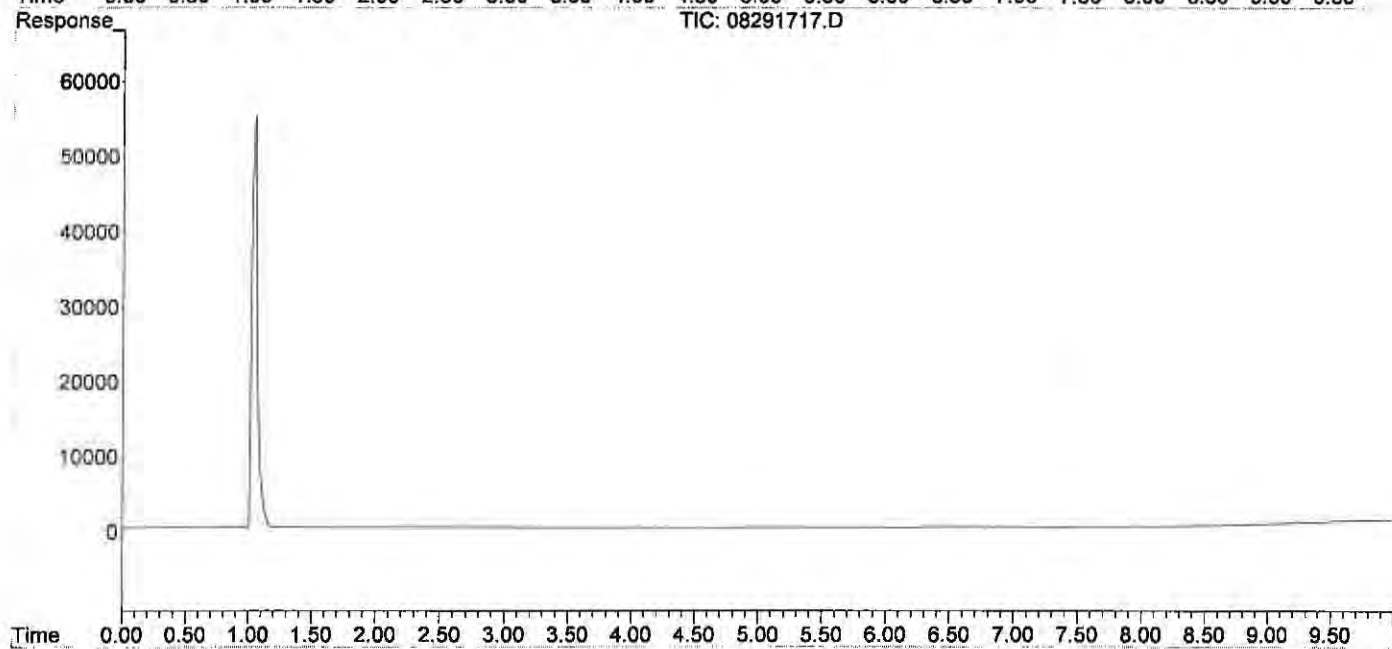
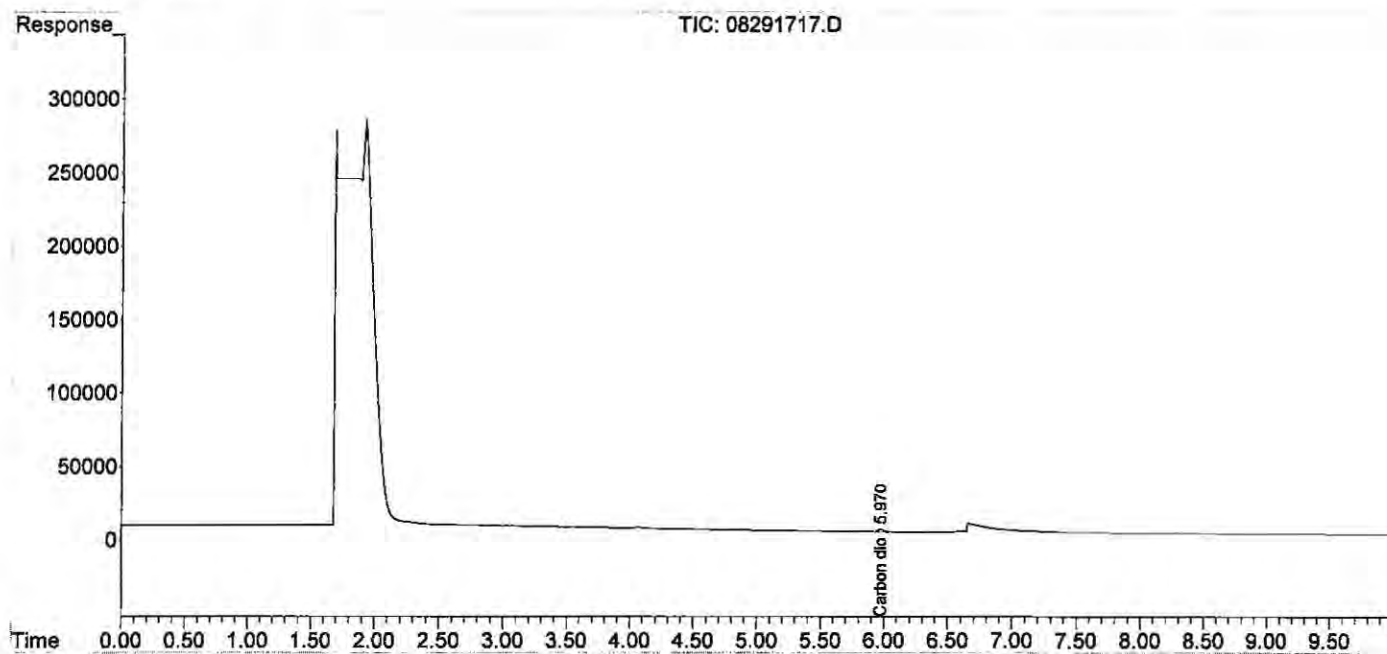
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
Data File : 08291717.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 29-Aug-2017, 14:53
Operator : MC
Sample : 250ppm s32-08291702 0.5ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 29 15:03:42 2017
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 14:52:06 2017
Response via : Initial Calibration
Integrator: ChemStation

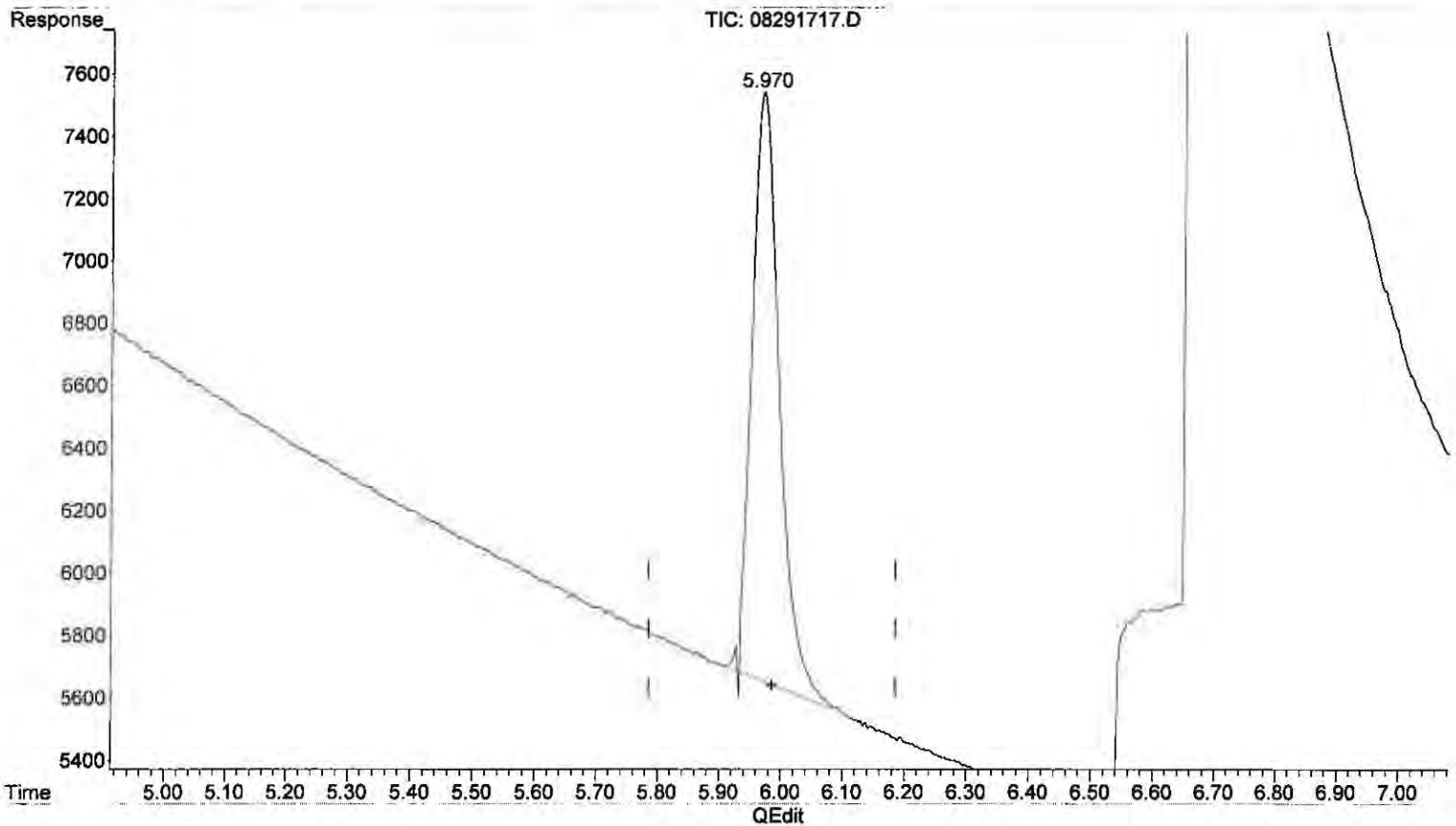
Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
 Data File : 08291717.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 29-Aug-2017, 14:53
 Operator : MC
 Sample : 250ppm s32-08291702 0.5ml
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Aug 29 15:03:42 2017
 Quant Method : I:\GC10\METHODS\RS082817_CO2.M
 Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 QLast Update : Tue Aug 29 14:52:06 2017
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :



(4) Carbon dioxide
 5.970min 240.204 ppm m
 response 58461

*Mc
 8/1/17
 PL
 Ms
 Prewer*

Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
 Data File : 08291719.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 29-Aug-2017, 15:23
 Operator : MC
 Sample : 2500ppm s32-08231701 50ul
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Aug 29 15:35:50 2017
 Quant Method : I:\GC10\METHODS\RS082817_CO2.M
 Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 QLast Update : Tue Aug 29 15:04:14 2017
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :

Compound	R.T.	Response	Conc	Units

Target Compounds				
1) Oxygen/Argon	0.000	0	N.D.	ppm d
2) Carbon monoxide	1.891	425113	N.D.	ppm
3) Methane (TCD)	0.000	0	N.D.	ppm d
4) Carbon dioxide	5.962	568043	2369.673	ppm
6) Methane (FID)	0.000	0	N.D.	ppm d
7) Ethylene	0.000	0	N.D.	ppm
8) Ethane	0.000	0	N.D.	ppm
9) Propylene	0.000	0	N.D.	ppm
10) Propane	0.000	0	N.D.	ppm
11) Isobutylene	0.000	0	N.D.	ppm
12) Isobutane	0.000	0	N.D.	ppm
13) n-Butane	0.000	0	N.D.	ppm

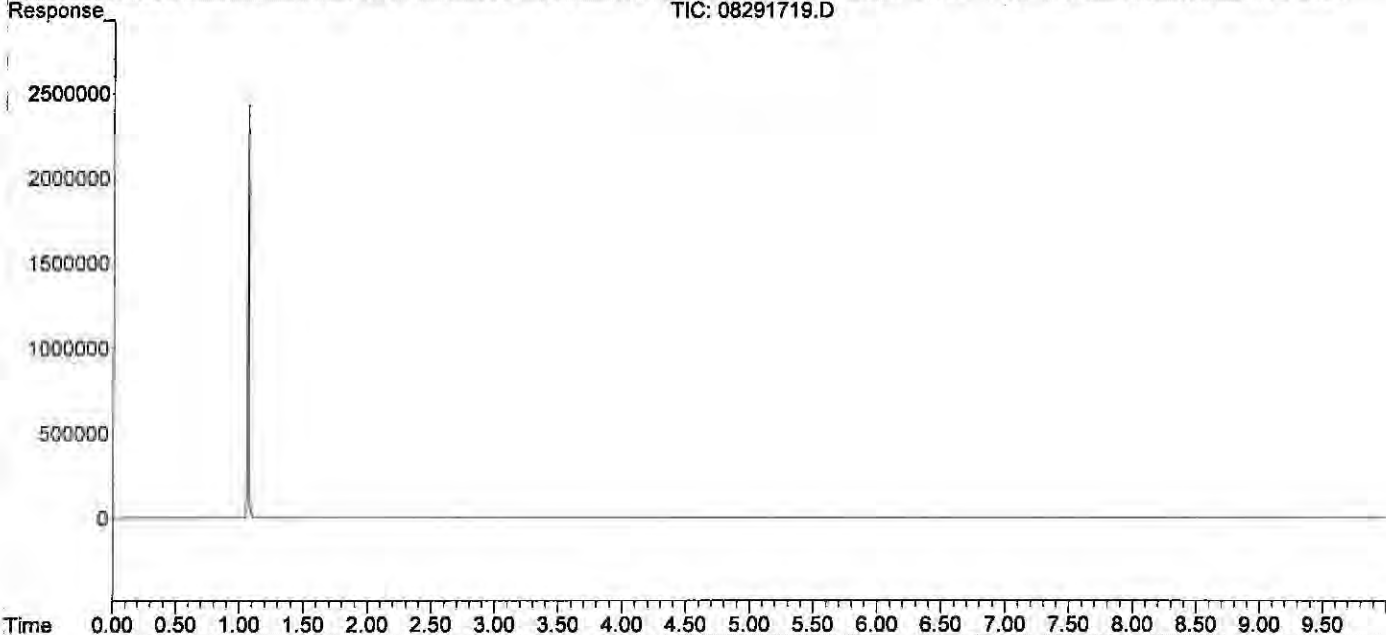
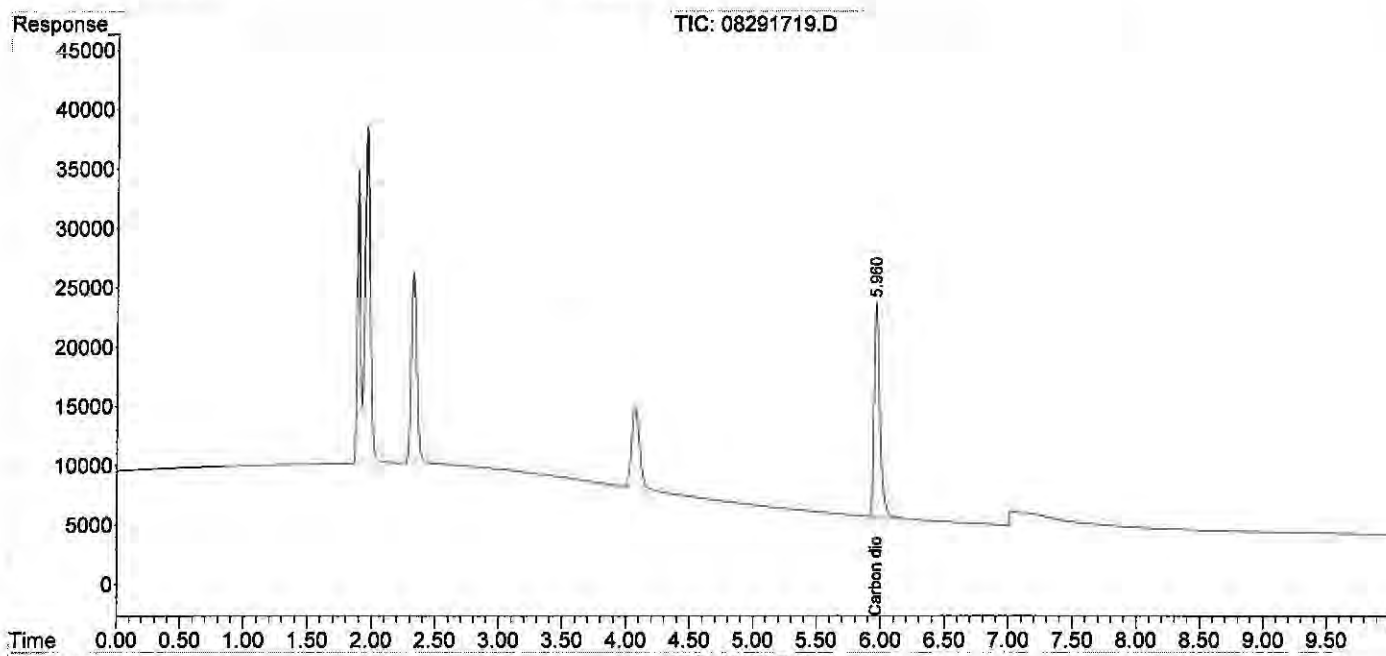
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
 Data File : 08291719.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 29-Aug-2017, 15:23
 Operator : MC
 Sample : 2500ppm s32-08231701 50ul
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Aug 29 15:35:50 2017
 Quant Method : I:\GC10\METHODS\RS082817_CO2.M
 Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 QLast Update : Tue Aug 29 15:04:14 2017
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :



Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
 Data File : 08291720.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 29-Aug-2017, 15:44
 Operator : MC
 Sample : 5000ppm s32-08231701 0.1ml
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Aug 29 15:57:17 2017
 Quant Method : I:\GC10\METHODS\RS082817_CO2.M
 Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 QLast Update : Tue Aug 29 15:36:14 2017
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :

Compound	R.T.	Response	Conc	Units
Target Compounds				
1) Oxygen/Argon	0.000	0	N.D.	ppm d
2) Carbon monoxide	1.880	819221	N.D.	ppm
3) Methane (TCD)	0.000	0	N.D.	ppm d
4) Carbon dioxide	5.948	1132363	4753.126	ppm
6) Methane (FID)	0.000	0	N.D.	ppm d
7) Ethylene	0.000	0	N.D.	ppm
8) Ethane	0.000	0	N.D.	ppm
9) Propylene	0.000	0	N.D.	ppm
10) Propane	0.000	0	N.D.	ppm
11) Isobutylene	0.000	0	N.D.	ppm
12) Isobutane	0.000	0	N.D.	ppm
13) n-Butane	0.000	0	N.D.	ppm

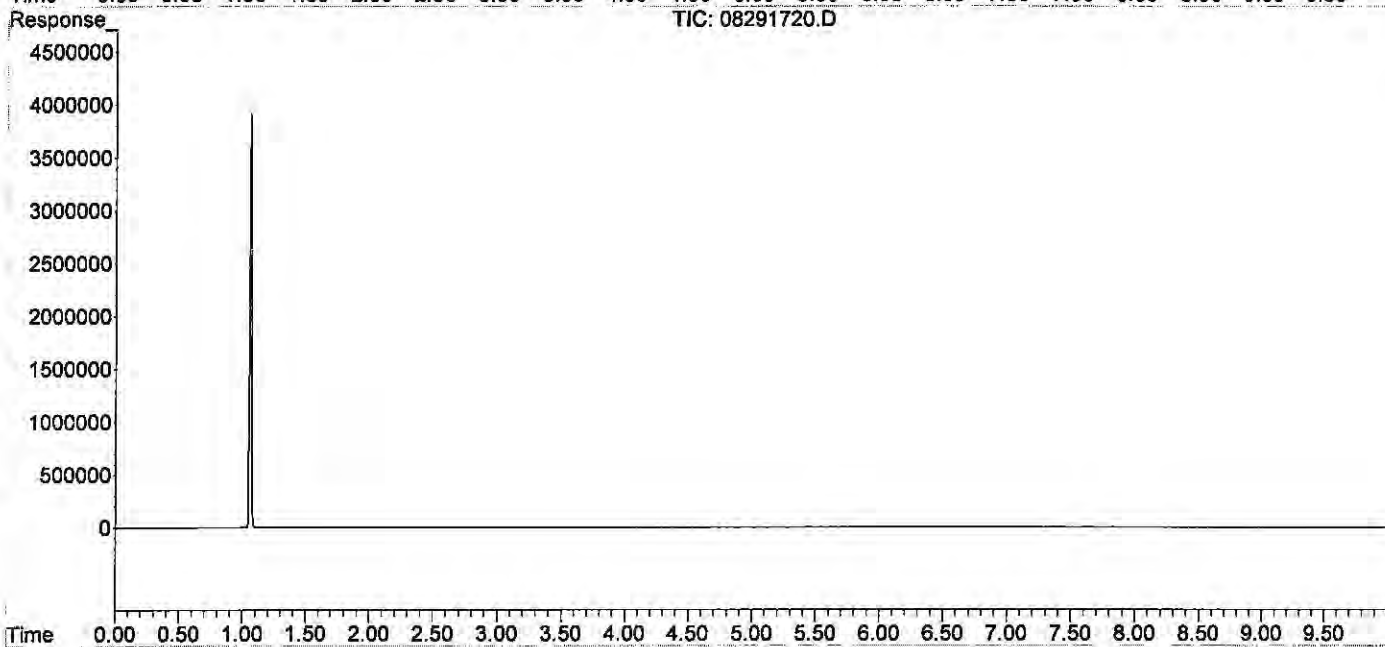
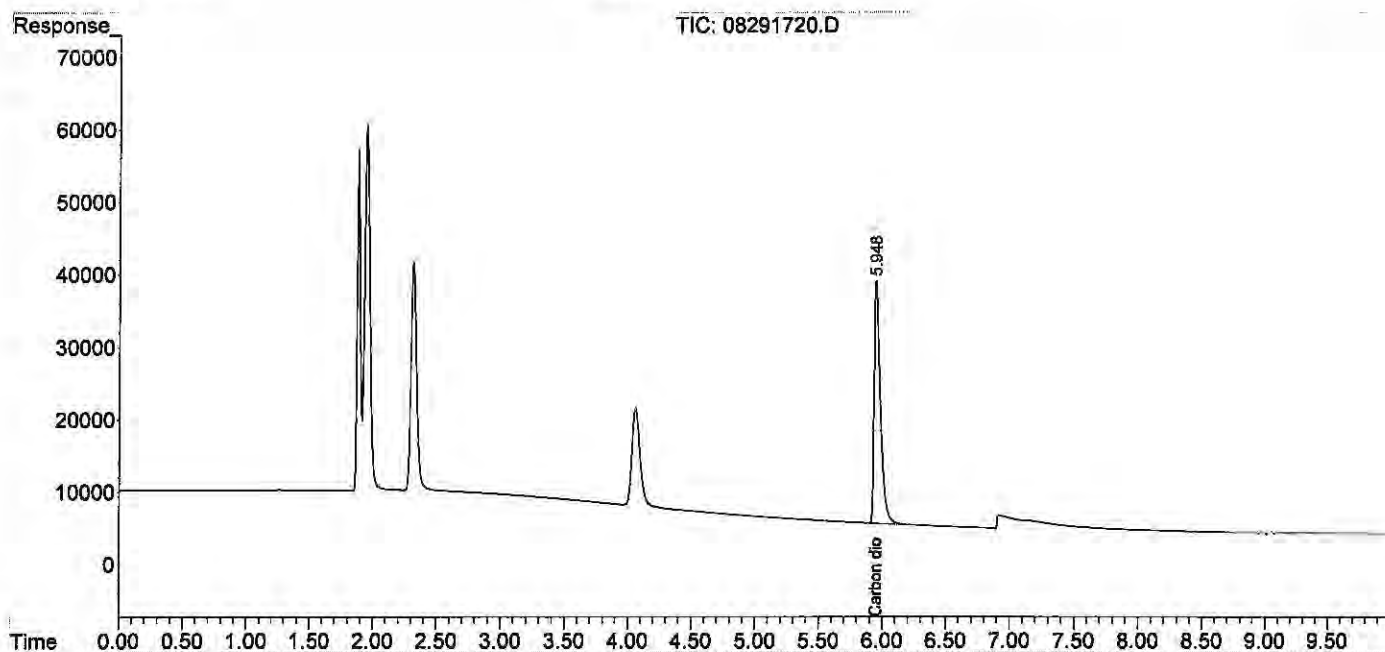
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
 Data File : 08291720.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 29-Aug-2017, 15:44
 Operator : MC
 Sample : 5000ppm s32-08231701 0.1ml
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Aug 29 15:57:17 2017
 Quant Method : I:\GC10\METHODS\RS082817_CO2.M
 Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 QLast Update : Tue Aug 29 15:36:14 2017
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :



Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
 Data File : 08291721.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 29-Aug-2017, 16:00
 Operator : MC
 Sample : 25000ppm s32-08231701 0.5ml
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Aug 29 16:12:53 2017
 Quant Method : I:\GC10\METHODS\RS082817_CO2.M
 Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 QLast Update : Tue Aug 29 15:57:37 2017
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :

Compound	R.T.	Response	Conc	Units
Target Compounds				
1) Oxygen/Argon	0.000	0	N.D.	ppm d
2) Carbon monoxide	1.827	3325463	N.D.	ppm
3) Methane (TCD)	0.000	0	N.D.	ppm d
4) Carbon dioxide	5.879f	5744295	24443.288	ppm
6) Methane (FID)	0.000	0	N.D.	ppm d
7) Ethylene	0.000	0	N.D.	ppm
8) Ethane	0.000	0	N.D.	ppm
9) Propylene	0.000	0	N.D.	ppm
10) Propane	0.000	0	N.D.	ppm
11) Isobutylene	0.000	0	N.D.	ppm
12) Isobutane	0.000	0	N.D.	ppm
13) n-Butane	0.000	0	N.D.	ppm

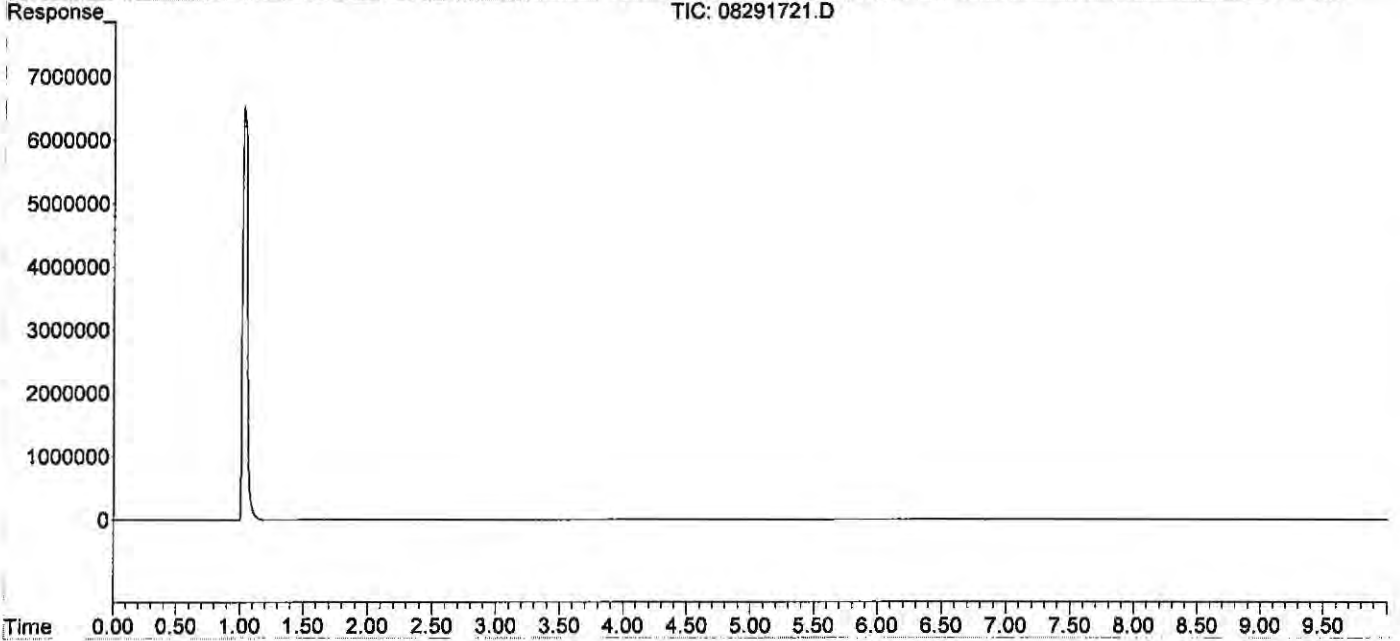
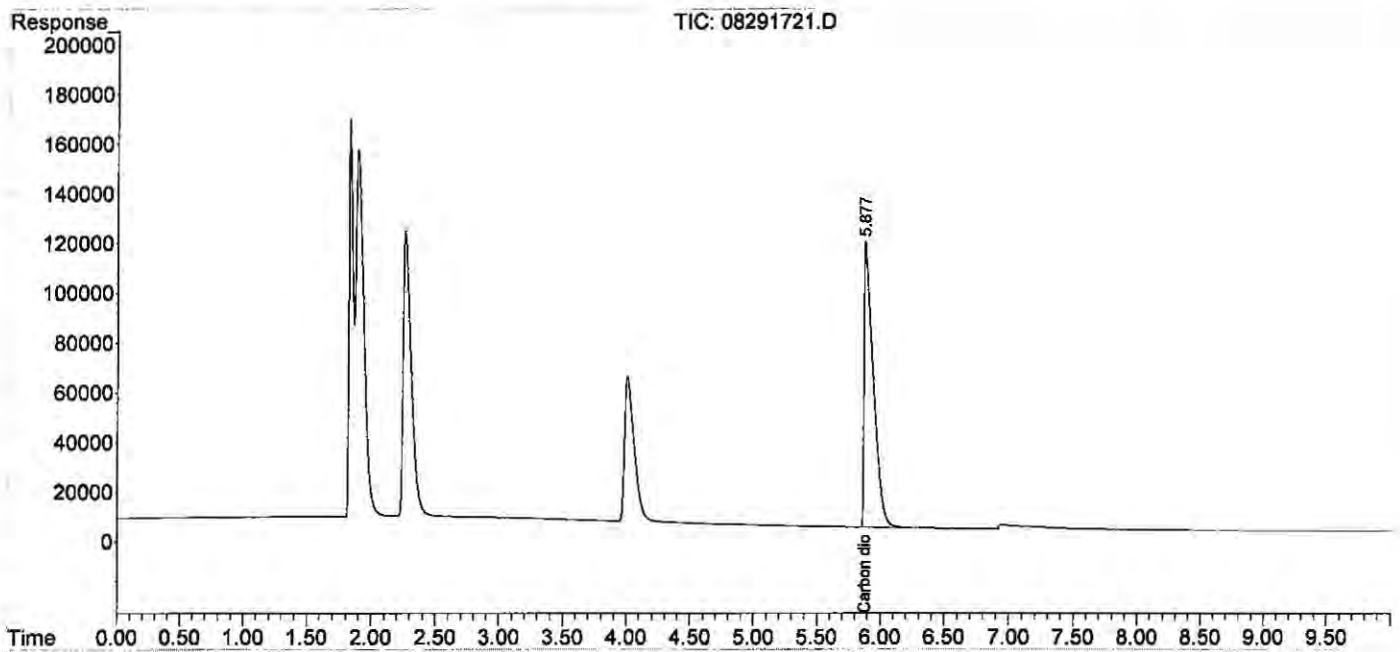
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
 Data File : 08291721.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 29-Aug-2017, 16:00
 Operator : MC
 Sample : 25000ppm s32-08231701 0.5ml
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Aug 29 16:12:53 2017
 Quant Method : I:\GC10\METHODS\RS082817_CO2.M
 Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 QLast Update : Tue Aug 29 15:57:37 2017
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :



Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
 Data File : 08291723.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 29-Aug-2017, 16:35
 Operator : MC
 Sample : icv s30-07071701
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Aug 29 16:54:07 2017
 Quant Method : I:\GC10\METHODS\RS082817_CO2.M
 Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 QLast Update : Tue Aug 29 16:13:13 2017
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :

Compound	R.T.	Response	Conc Units	

Target Compounds				
1) Oxygen/Argon	1.886	536422	0.113 ppm	Actual %D
2) Carbon monoxide	1.886	536422	N.D. ppm	
3) Methane (TCD)	4.059f	626500	66244.710 ppm	
4) Carbon dioxide	5.947	1163775	4957.948 ppm	5000 99.16
6) Methane (FID)	1.062	37290742	3947.023 ppm	
7) Ethylene	0.000	0	N.D. ppm	
8) Ethane	0.000	0	N.D. ppm	
9) Propylene	0.000	0	N.D. ppm	
10) Propane	0.000	0	N.D. ppm	
11) Isobutylene	0.000	0	N.D. ppm	
12) Isobutane	0.000	0	N.D. ppm	
13) n-Butane	0.000	0	N.D. ppm	

(f)=RT Delta > 1/2 Window

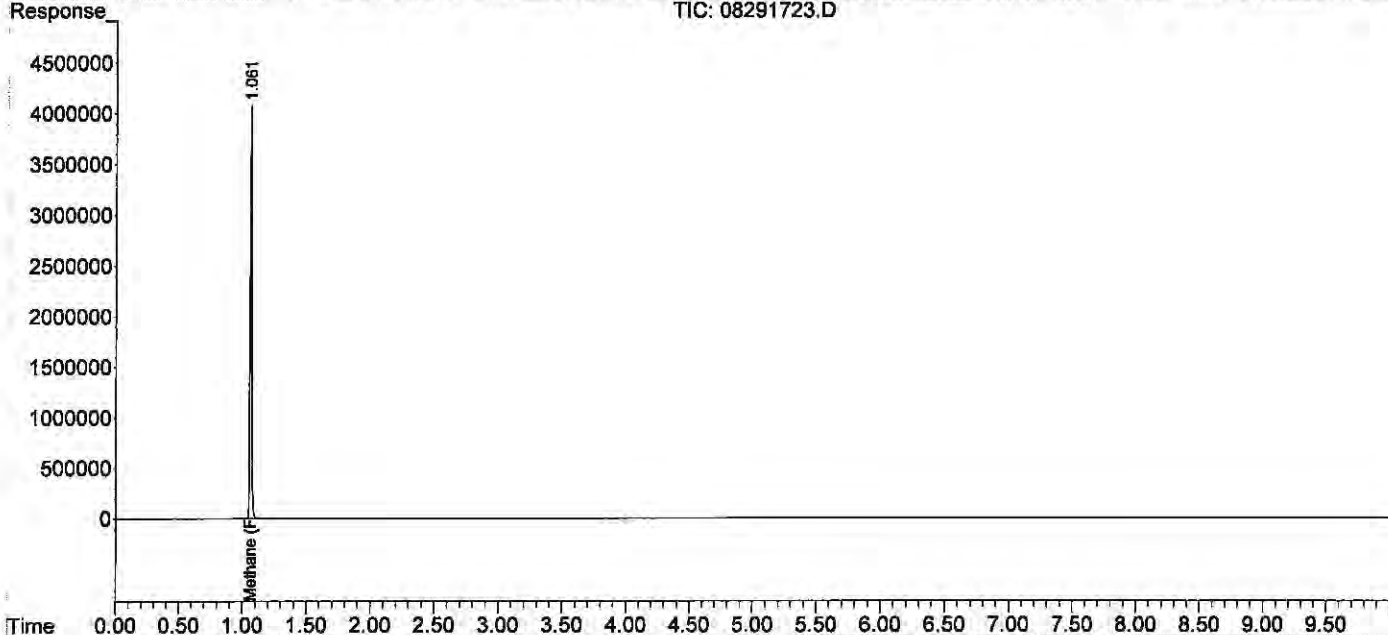
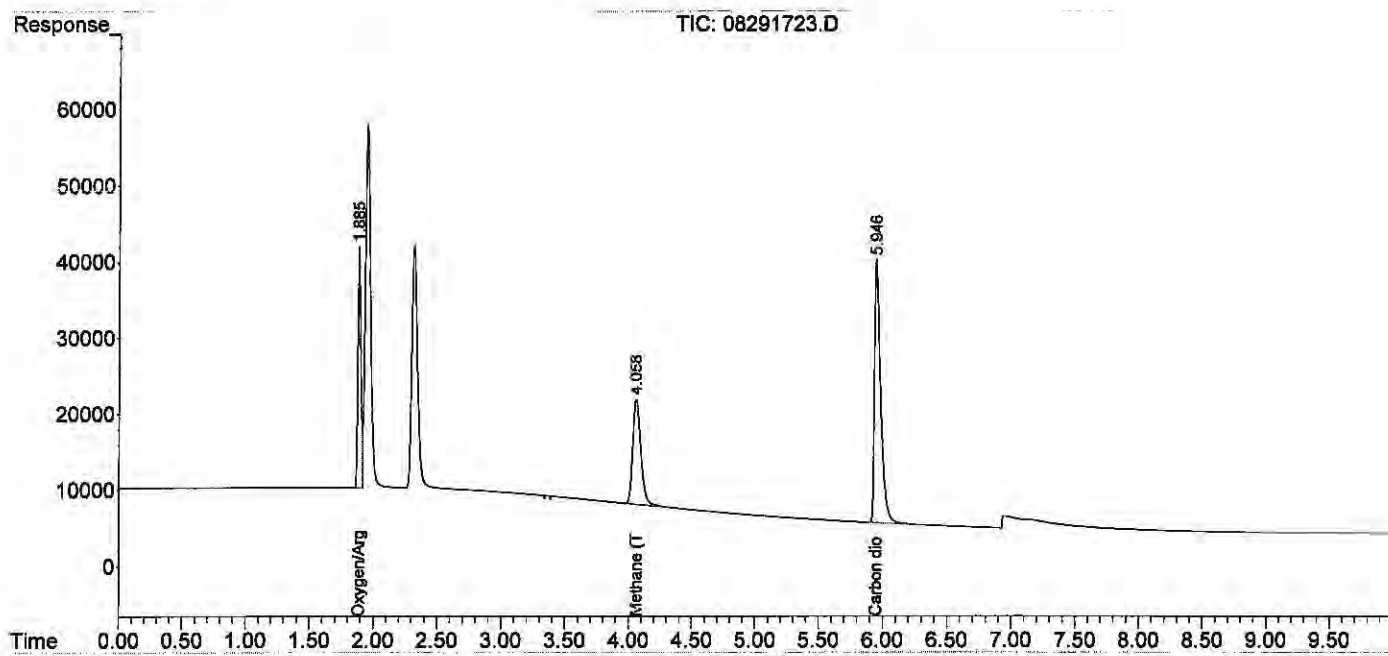
(m)=manual int.

W 9/4/17

Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
 Data File : 08291723.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 29-Aug-2017, 16:35
 Operator : MC
 Sample : icv s30-07071701
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Aug 29 16:54:07 2017
 Quant Method : I:\GC10\METHODS\RS082817_CO2.M
 Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 QLast Update : Tue Aug 29 16:13:13 2017
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :



ALS Environmental

Method : RSK175 Headspace Method for Dissolved Hydrocarbon in Water by FID/TCD
 Client : ALS Laboratory Group Analyst : WH
 Service Request : P1904674 Date Analysis : 08/13/19
 Sample Vol. (ml) : 32.00 ml Head Space Vol.(ml) : 8.00 ml

Instrument : GC#10
 Detector : FID#10, TCD#10
 Gas Constant : 24.05684 (20°C)

HEAD SPACE RESULT (ppm)

FINAL HEAD SPACE RESULT (ppm)

Sample ID	Ini. Vol.	Carbon Dioxide	WWL	HENRY'S CONSTANT	RL	Carbon Dioxide
std s32-06271901	0.100	5010.748				44.10
ACTUAL		5000.00				1.42E+03
%Difference		0.2%				100.00
MCS 0.1ml	0.100	0.000	MCS 0.1ml			0.000
RB 0.1ml	0.100	0.000				
LCS TCD	0.100	903.862	LCS TCD			9038.620
LCSD TCD	0.100	914.386	LCSD TCD			9143.860
p1904674-001 0.1ml	0.100	680.18	p1904674-001 0.1ml			6801.75
p1904674-002 0.1ml	0.100	12968.47	p1904674-002 0.1ml			129684.72
p1904674-003 0.1ml	0.100	6517.55	p1904674-003 0.1ml			65175.51
p1904674-004 0.1ml	0.100	6633.87	p1904674-004 0.1ml			66338.67

STD s32-06271901
 ACTUAL
 %Difference

4550.171
 5000.00
 9.0%

Data Path : J:\GC10\DATA\RSK_FID\2019_08\13CO2\
 Data File : 08131901.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 13-Aug-2019, 11:16:08
 Operator : WH
 Sample : std s32-06271901
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Aug 13 11:41:50 2019
 Quant Method : I:\GC10\METHODS\RS082817_CO2.M
 Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 QLast Update : Tue Aug 29 16:13:13 2017
 Response via : Initial Calibration
 Integrator: ChemStation

W# 8/13/19

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :

Compound	R.T.	Response	Conc	Units

Target Compounds				
1) Oxygen/Argon	1.956f	1122305	0.236	ppm
2) Carbon monoxide	1.956f	1122305	N.D.	ppm
3) Methane (TCD)	0.000	0	N.D.	ppm
4) Carbon dioxide	6.044	1176169	5010.748	ppm m
6) Methane (FID)	0.000	0	N.D.	ppm
7) Ethylene	0.000	0	N.D.	ppm
8) Ethane	0.000	0	N.D.	ppm
9) Propylene	0.000	0	N.D.	ppm
10) Propane	0.000	0	N.D.	ppm
11) Isobutylene	0.000	0	N.D.	ppm
12) Isobutane	0.000	0	N.D.	ppm
13) n-Butane	0.000	0	N.D.	ppm

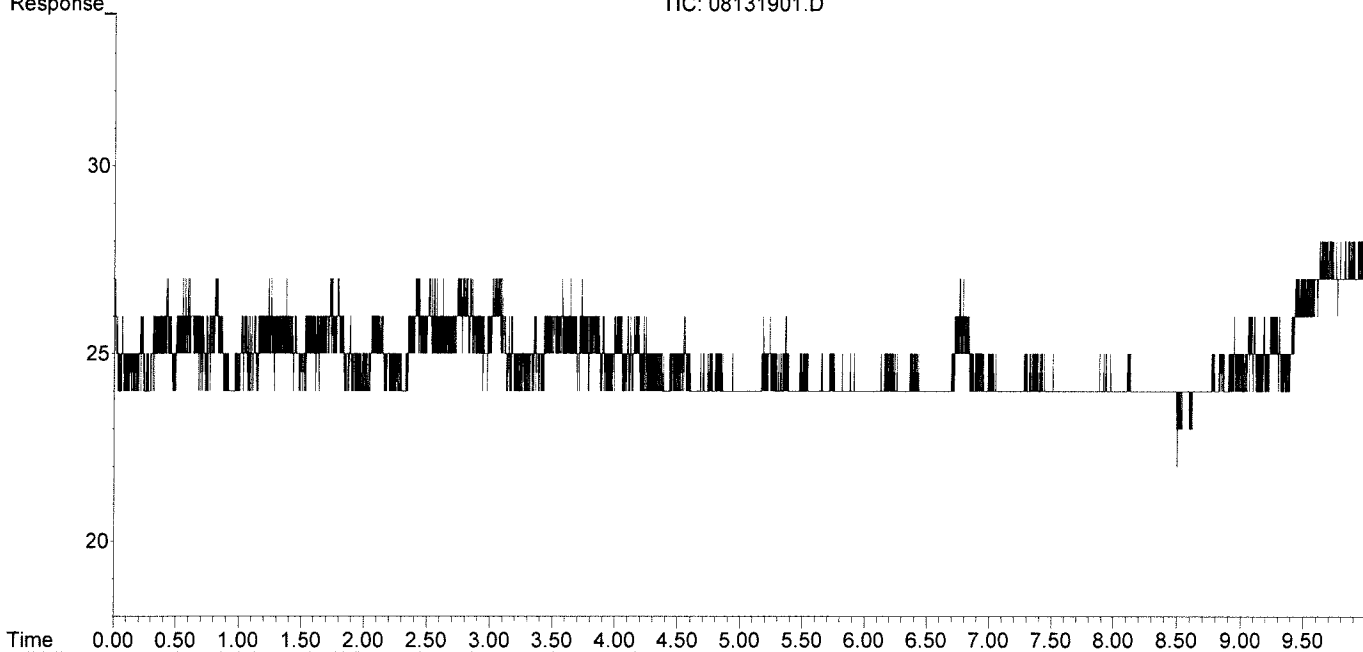
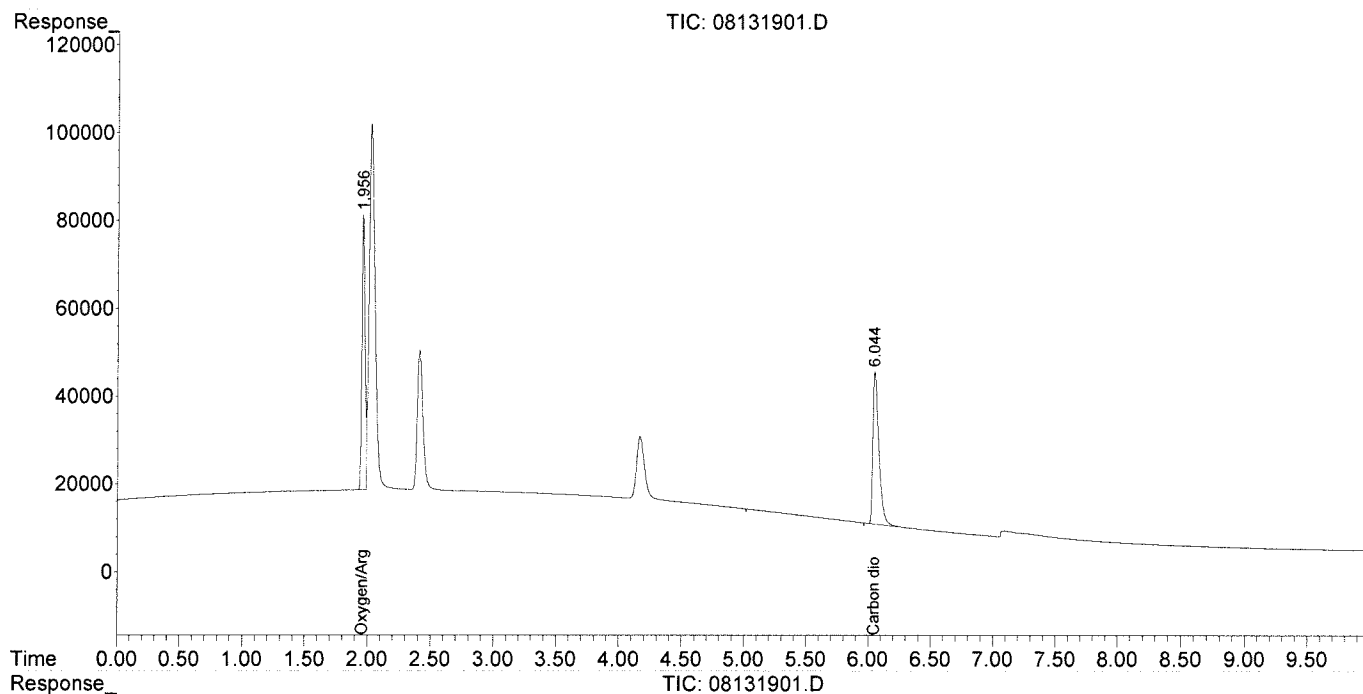
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2019_08\13CO2\
 Data File : 08131901.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 13-Aug-2019, 11:16:08
 Operator : WH
 Sample : std s32-06271901
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Aug 13 11:41:50 2019
 Quant Method : I:\GC10\METHODS\RS082817_CO2.M
 Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 QLast Update : Tue Aug 29 16:13:13 2017
 Response via : Initial Calibration
 Integrator: ChemStation

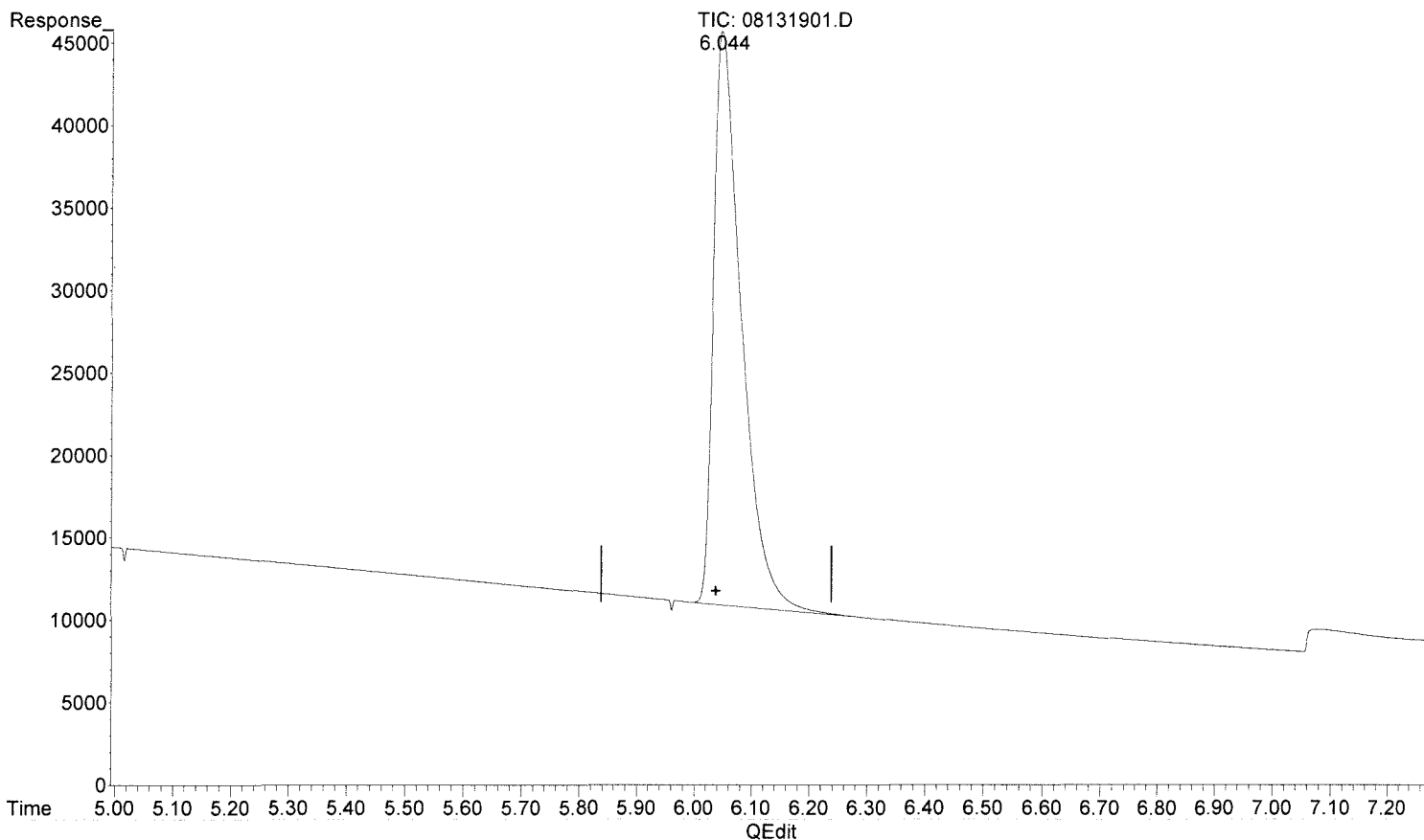
Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :



Data Path : J:\GC10\DATA\RSK_FID\2019_08\13CO2\
Data File : 08131901.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 13-Aug-2019, 11:16:08
Operator : WH
Sample : std s32-06271901
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 13 11:41:50 2019
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-T03C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



(4) Carbon dioxide
6.044min 5010.748 ppm m
response 1176169

*MR
8/14/19*

*W 8/13/19
BLC
w/ (arrow)*

Data Path : J:\GC10\DATA\RSK_FID\2019_08\13CO2\
 Data File : 08131914.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 13-Aug-2019, 15:39:25
 Operator : WH
 Sample : STD s32-06271901
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Aug 13 15:48:36 2019
 Quant Method : I:\GC10\METHODS\RS082817_CO2.M
 Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 QLast Update : Tue Aug 29 16:13:13 2017
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :

Compound	R.T.	Response	Conc	Units

Target Compounds				
1) Oxygen/Argon	1.951f	1166042	0.245	ppm
2) Carbon monoxide	1.951f	1166042	N.D.	ppm
3) Methane (TCD)	0.000	0	N.D.	ppm
4) Carbon dioxide	6.048	1068058	4550.171	ppm m
6) Methane (FID)	0.000	0	N.D.	ppm
7) Ethylene	0.000	0	N.D.	ppm
8) Ethane	0.000	0	N.D.	ppm
9) Propylene	0.000	0	N.D.	ppm
10) Propane	0.000	0	N.D.	ppm
11) Isobutylene	0.000	0	N.D.	ppm
12) Isobutane	0.000	0	N.D.	ppm
13) n-Butane	0.000	0	N.D.	ppm

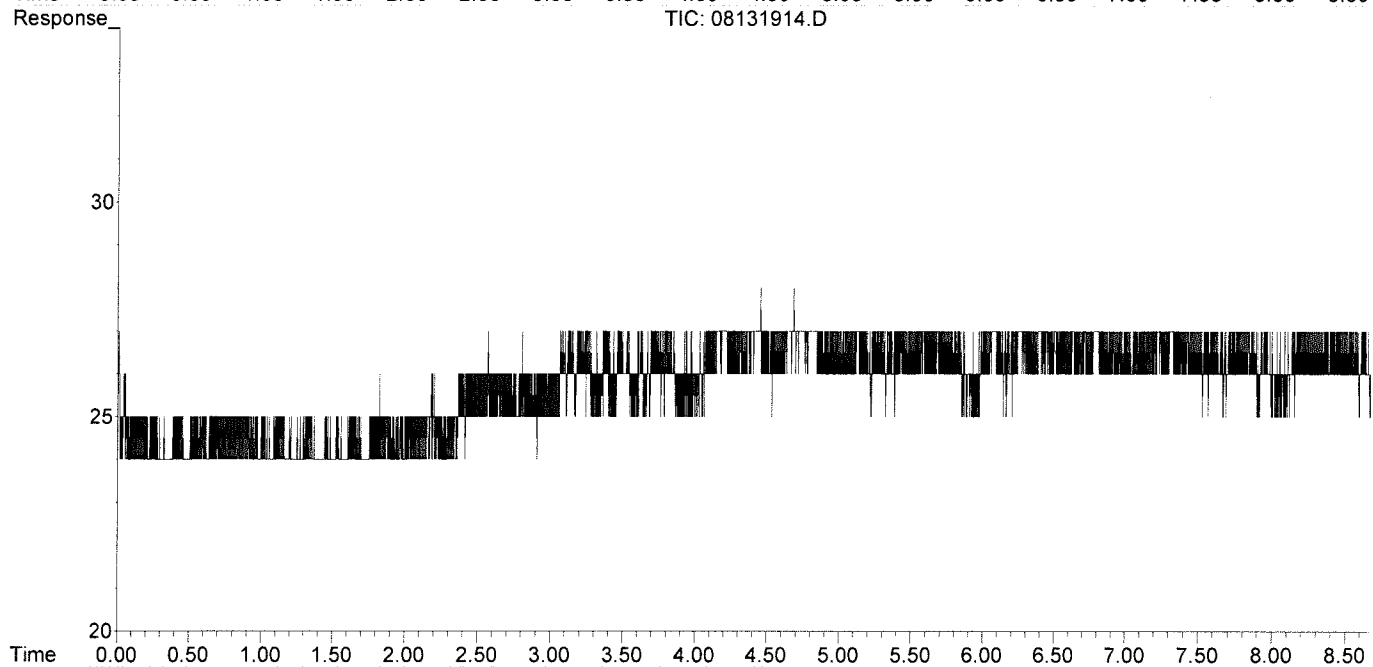
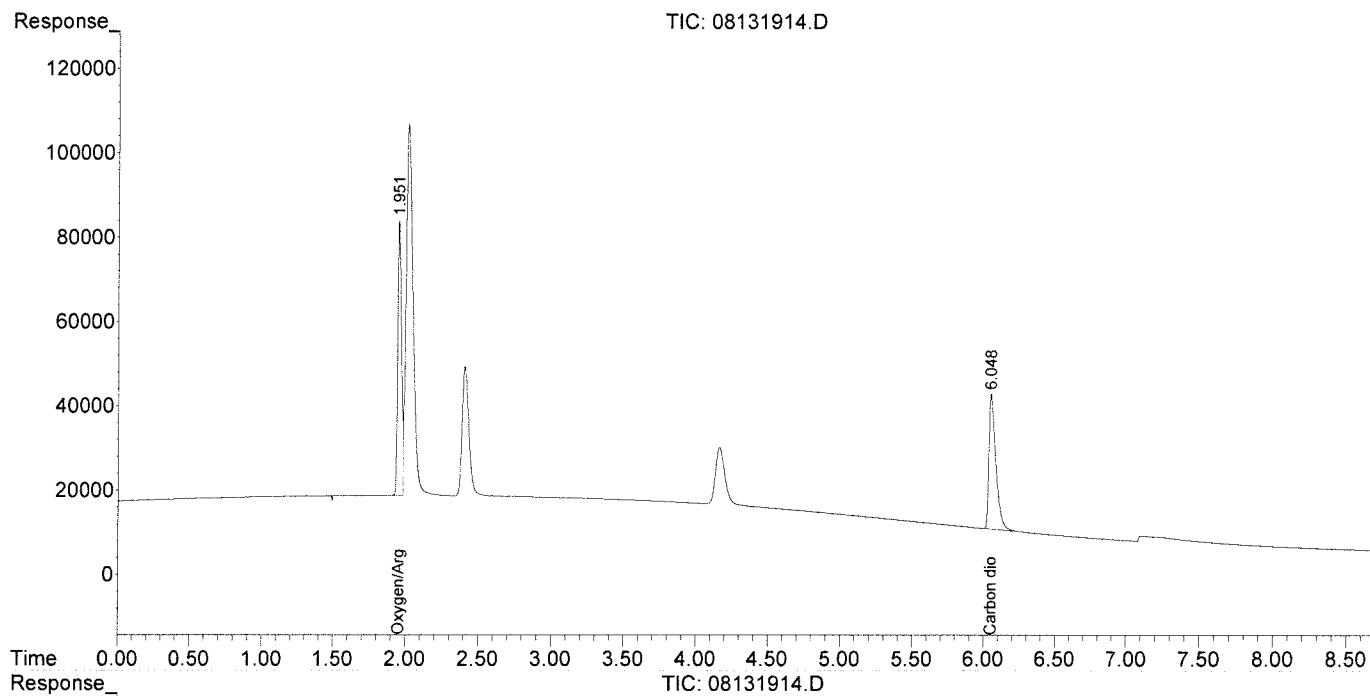
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2019_08\13CO2\
Data File : 08131914.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 13-Aug-2019, 15:39:25
Operator : WH
Sample : STD s32-06271901
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 13 15:48:36 2019
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

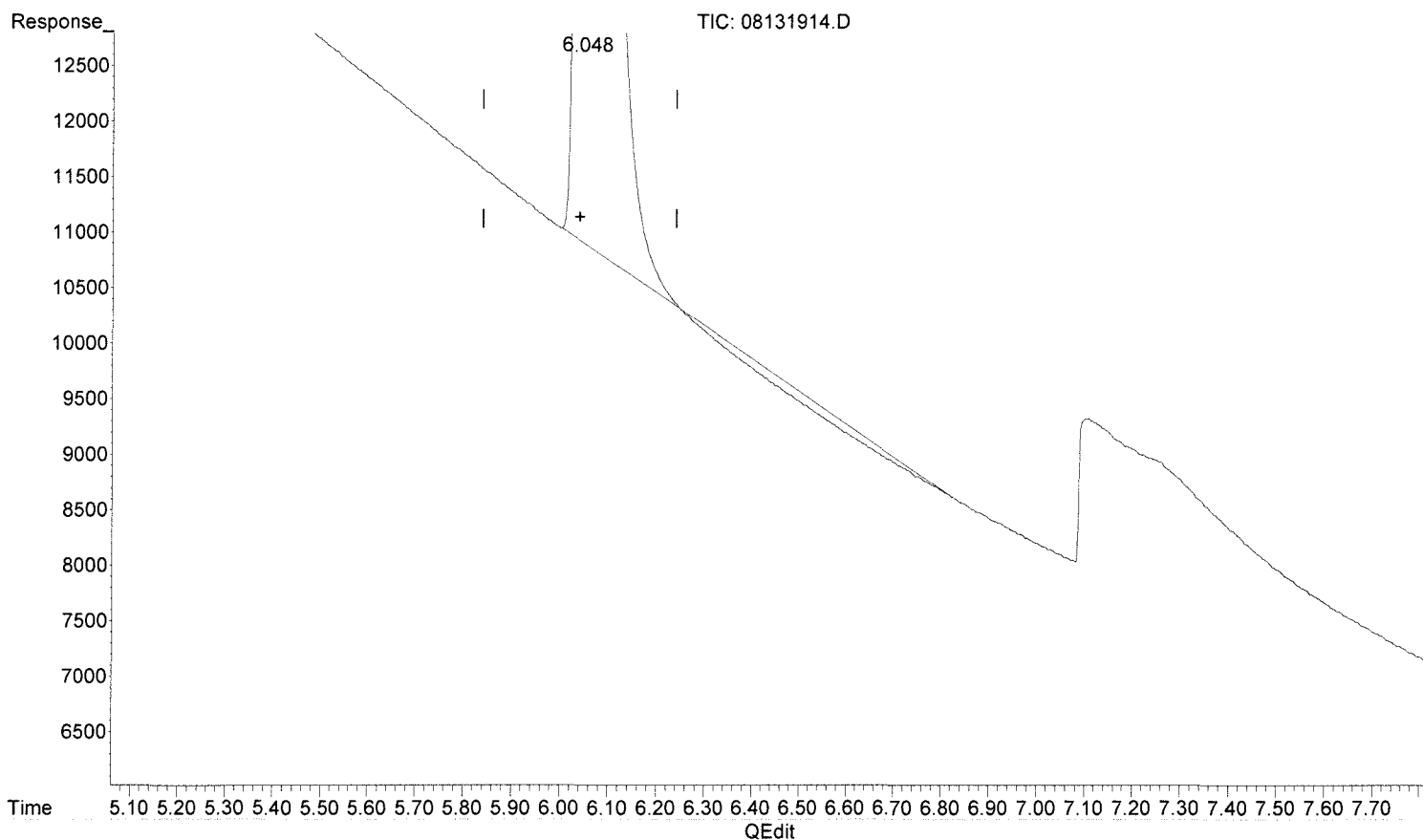
Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



Data Path : J:\GC10\DATA\RSK_FID\2019_08\13CO2\
 Data File : 08131914.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 13-Aug-2019, 15:39:25
 Operator : WH
 Sample : STD s32-06271901
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Aug 13 15:48:36 2019
 Quant Method : I:\GC10\METHODS\RS082817_CO2.M
 Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 QLast Update : Tue Aug 29 16:13:13 2017
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :

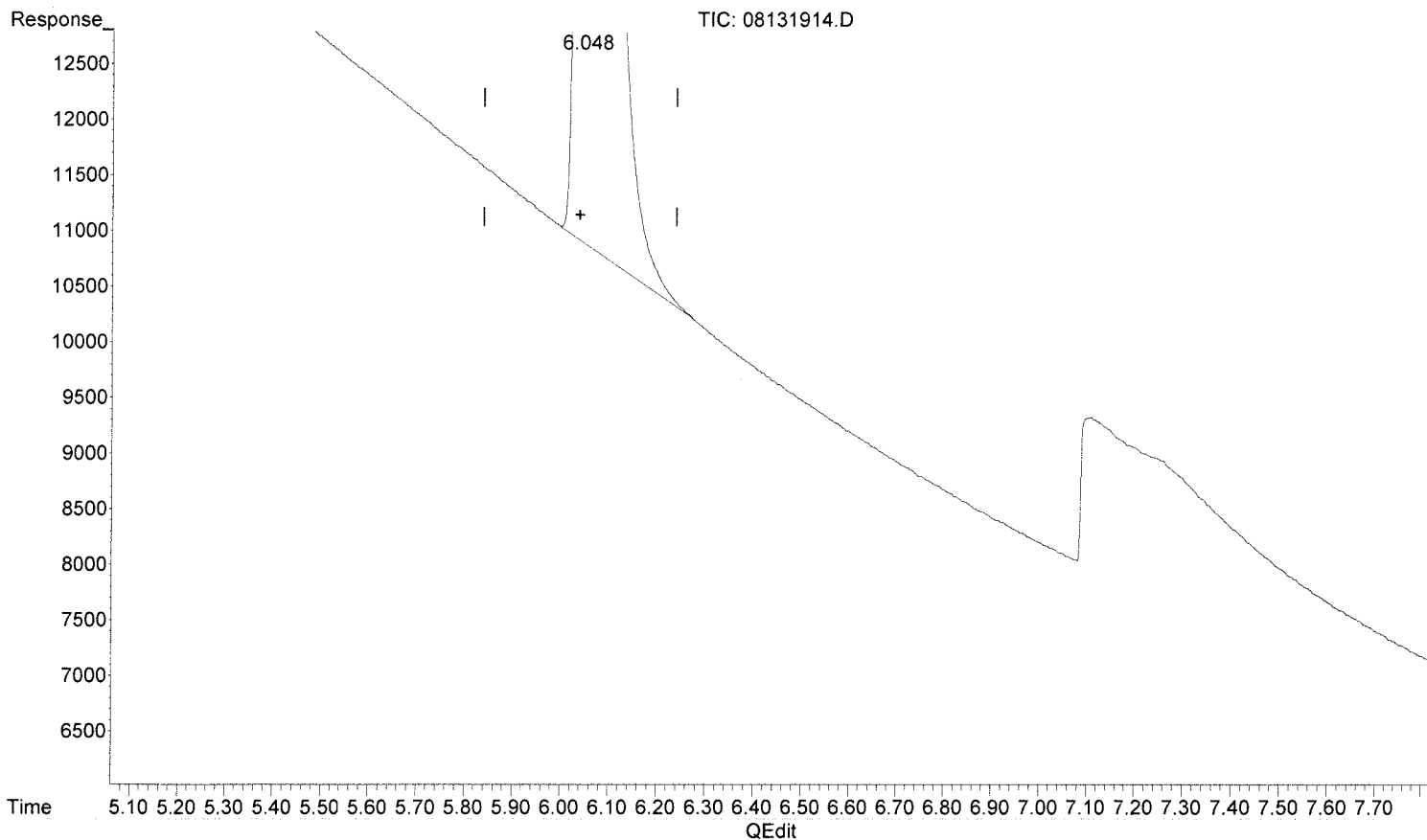


(4) Carbon dioxide
 6.048min 4451.090 ppm
 response 1044801

Data Path : J:\GC10\DATA\RSK_FID\2019_08\13CO2\
Data File : 08131914.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 13-Aug-2019, 15:39:25
Operator : WH
Sample : STD s32-06271901
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 13 15:48:36 2019
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



(4) Carbon dioxide
6.048min 4550.171 ppm m
response 1068058

*MP
8/14/19*

*WA 8/13/19
BLC*

Injection Log

00956904

Directory: I:\GC10\DATA\RSK_FID\2017_08\29\

	Date/Time	File Name	Sample ID	Misc Info	Operator	Acquisition Method	Comments
1	29-Aug-17, 07:58:00	08291701.D	std s30-06161601		MC	RSKBOTH.M	Pass
2	29-Aug-17, 08:11:02	08291702.D	mb 0.5ml		MC	RSKBOTH.M	Pass
3	29-Aug-17, 08:24:13	08291703.D	4089-001 0.5ml		MC	RSKBOTH.M	
4	29-Aug-17, 08:39:29	08291704.D	4089-002 0.5ml		MC	RSKBOTH.M	
5	29-Aug-17, 08:53:38	08291705.D	4089-003 0.5ml		MC	RSKBOTH.M	
6	29-Aug-17, 09:33:52	08291706.D	4089-004 0.5ml		MC	RSKBOTH.M	
7	29-Aug-17, 09:50:51	08291707.D	4089-005 0.5ml		MC	RSKBOTH.M	
8	29-Aug-17, 10:07:54	08291708.D	4089-006 0.5ml		MC	RSKBOTH.M	
9	29-Aug-17, 10:42:34	08291709.D	4089-007 0.5ml		MC	RSKBOTH.M	
10	29-Aug-17, 11:06:01	08291710.D	4089-008 0.5ml		MC	RSKBOTH.M	
11	29-Aug-17, 11:23:53	08291711.D	4089-009 0.5ml		MC	RSKBOTH.M	
12	29-Aug-17, 11:37:17	08291712.D	lcs s30-05241604		MC	RSKBOTH.M	Pass
13	29-Aug-17, 11:50:31	08291713.D	lcs s30-05241604		MC	RSKBOTH.M	Pass
14	29-Aug-17, 12:29:45	08291714.D	std s30-06161601		MC	RSKBOTH.M	Pass
15	29-Aug-17, 14:07:01	08291715.D	25ppm s32-08291701 0.25ml		MC	RSKBOTH.M	Curve
16	29-Aug-17, 14:22:12	08291716.D	100ppm s32-08291702 0.2ml		MC	RSKBOTH.M	Curve
17	29-Aug-17, 14:53:00	08291717.D	250ppm s32-08291702 0.5ml		MC	RSKBOTH.M	Curve
18	29-Aug-17, 15:07:43	08291718.D	mis Inject		MC	RSKBOTH.M	
19	29-Aug-17, 15:23:21	08291719.D	2500ppm s32-08231701 50ul		MC	RSKBOTH.M	Curve
20	29-Aug-17, 15:44:54	08291720.D	5000ppm s32-08231701 0.1ml		MC	RSKBOTH.M	Curve
21	29-Aug-17, 16:00:09	08291721.D	25000ppm s32-08231701 0.5ml		MC	RSKBOTH.M	Curve
22	29-Aug-17, 16:15:43	08291722.D	mb 0.1ml		MC	RSKBOTH.M	Pass
23	29-Aug-17, 16:35:37	08291723.D	lcv s30-07071701		MC	RSKBOTH.M	Pass

Directory: I:\GC10\DATA\RSK_TCD\2019_08\13\

	Date/Time	File Name	Sample ID	Misc Info	Operator	Acquisition Method	Comments
1	13-Aug-19, 11:16:08	08131901.D	std s32-06271901		WH	RSKBOTH.M	
2	13-Aug-19, 11:43:23	08131902.D	RB 0.1ml		WH	RSKBOTH.M	
3	13-Aug-19, 12:01:26	08131903.D	MCS 0.1ml		WH	RSKBOTH.M	
4	13-Aug-19, 12:25:01	08131904.D	xLCS TCD		WH	RSKBOTH.M	
5	13-Aug-19, 12:36:48	08131905.D	LCS TCD		WH	RSKBOTH.M	
6	13-Aug-19, 12:48:06	08131906.D	LCS D TCD		WH	RSKBOTH.M	
7	13-Aug-19, 13:56:48	08131907.D	p1904674-001 0.1ml		WH	RSKBOTH.M	
8	13-Aug-19, 14:13:47	08131908.D	p1904674-002 0.1ml		WH	RSKBOTH.M	
9	13-Aug-19, 14:26:54	08131909.D	p1904674-003 0.1ml		WH	RSKBOTH.M	
10	13-Aug-19, 14:36:36	08131910.D	p1904674-004 0.1ml		WH	RSKBOTH.M	
11	13-Aug-19, 14:49:05	08131911.D	p1904717-001 0.1ml		WH	RSKBOTH.M	
12	13-Aug-19, 15:00:41	08131912.D	p1904717-002 0.1ml		WH	RSKBOTH.M	
13	13-Aug-19, 15:24:57	08131913.D	p1904717-003 0.1ml		WH	RSKBOTH.M	
14	13-Aug-19, 15:39:25	08131914.D	STD s32-06271901		WH	RSKBOTH.M	

Data Path : J:\GC10\DATA\RSK_FID\2019_08\12\
 Data File : 08121904.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 12-Aug-2019, 11:53:48
 Operator : WH
 Sample : P1904674-001 0.1ml
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Aug 12 15:51:49 2019
 Quant Method : I:\GC10\METHODS\RS091217_R.M
 Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 QLast Update : Wed Sep 13 11:14:47 2017
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :

Compound	R.T.	Response	Conc	Units

Target Compounds				
1) Oxygen/Argon	0.000	0	N.D.	ppm
2) Carbon monoxide	0.000	0	N.D.	ppm
3) Methane (TCD)	0.000	0	N.D.	ppm
4) Carbon dioxide	0.000	0	N.D.	ppm
6) Methane (FID)	0.000	0	N.D.	ppm
7) Ethylene	0.000	0	N.D.	ppm
8) Ethane	0.000	0	N.D.	ppm
9) Propylene	0.000	0	N.D.	ppm
10) Propane	0.000	0	N.D.	ppm
11) Isobutylene	0.000	0	N.D.	ppm
12) Isobutane	0.000	0	N.D.	ppm
13) n-Butane	0.000	0	N.D.	ppm

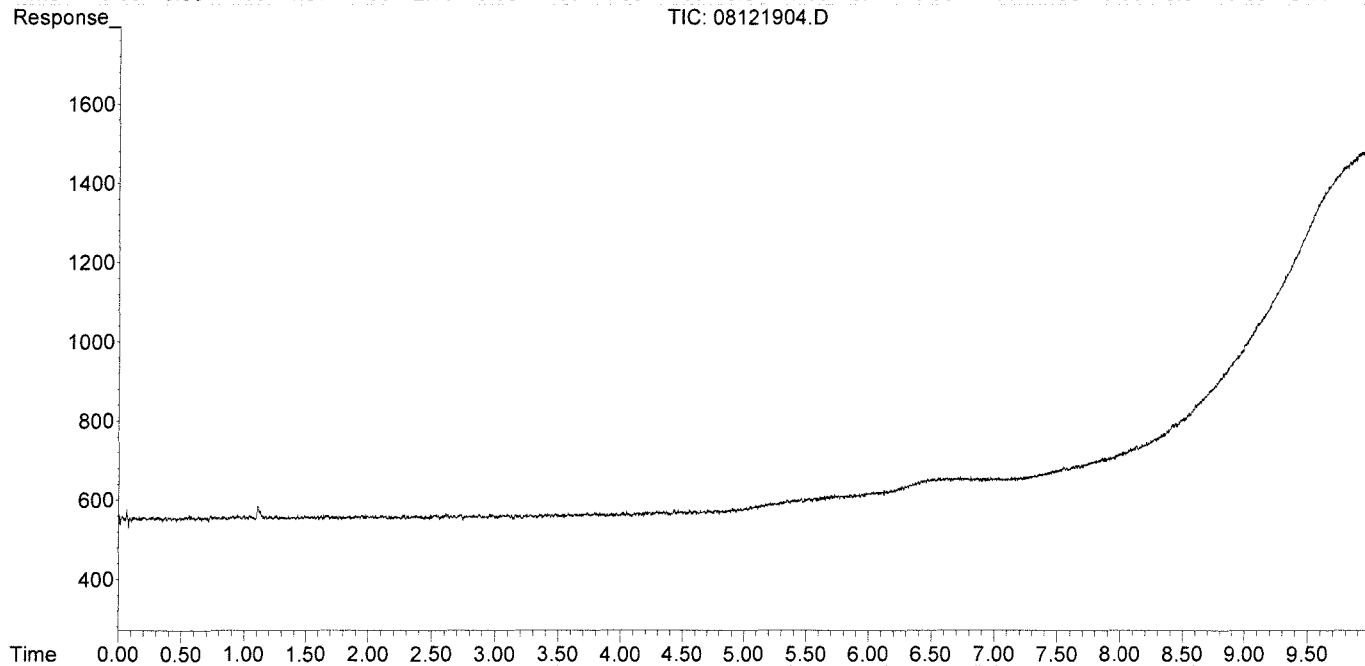
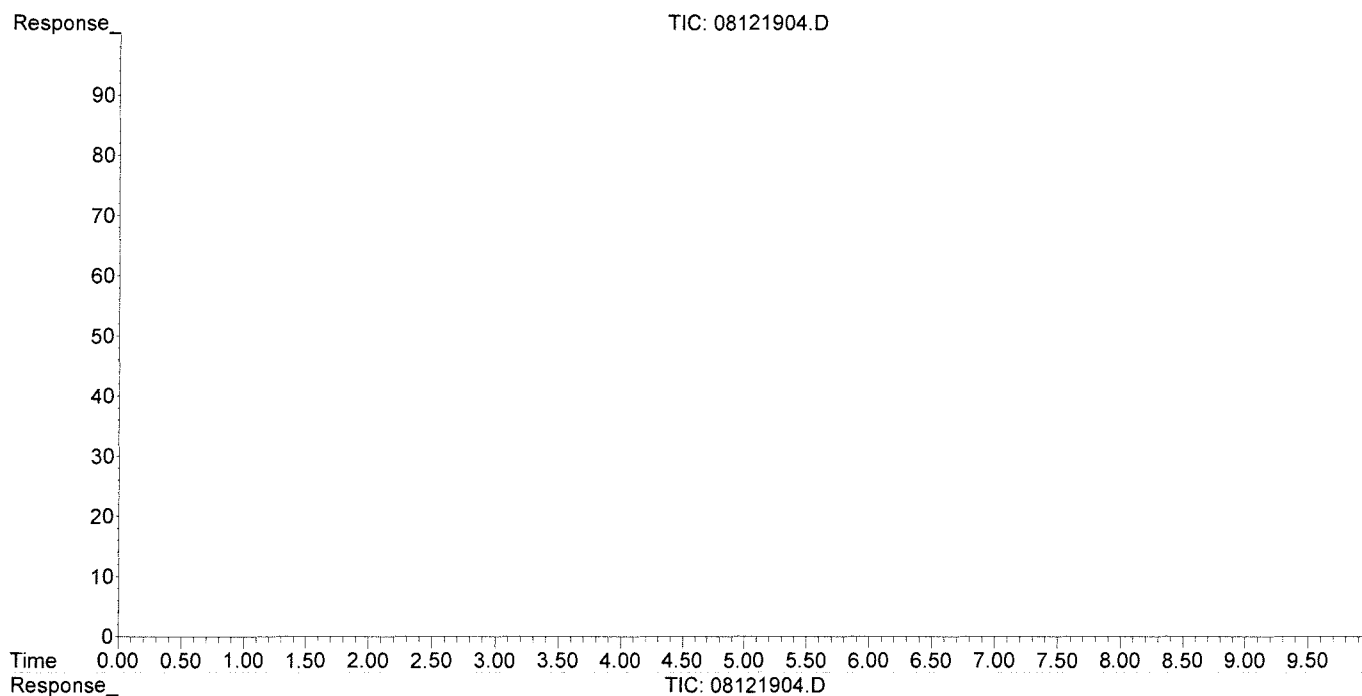
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2019_08\12\
Data File : 08121904.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Aug-2019, 11:53:48
Operator : WH
Sample : P1904674-001 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 12 15:51:49 2019
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



Data Path : J:\GC10\DATA\RSK_FID\2019_08\12\
 Data File : 08121905.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 12-Aug-2019, 12:17:24
 Operator : WH
 Sample : P1904674-002 0.1ml
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Aug 12 15:52:05 2019
 Quant Method : I:\GC10\METHODS\RS091217_R.M
 Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 QLast Update : Wed Sep 13 11:14:47 2017
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :

Compound	R.T.	Response	Conc	Units

Target Compounds				
1) Oxygen/Argon	0.000	0	N.D.	ppm
2) Carbon monoxide	0.000	0	N.D.	ppm
3) Methane (TCD)	0.000	0	N.D.	ppm
4) Carbon dioxide	0.000	0	N.D.	ppm
6) Methane (FID)	1.096	802	0.088	ppm m
7) Ethylene	0.000	0	N.D.	ppm
8) Ethane	0.000	0	N.D.	ppm
9) Propylene	0.000	0	N.D.	ppm
10) Propane	0.000	0	N.D.	ppm
11) Isobutylene	0.000	0	N.D.	ppm
12) Isobutane	0.000	0	N.D.	ppm
13) n-Butane	0.000	0	N.D.	ppm

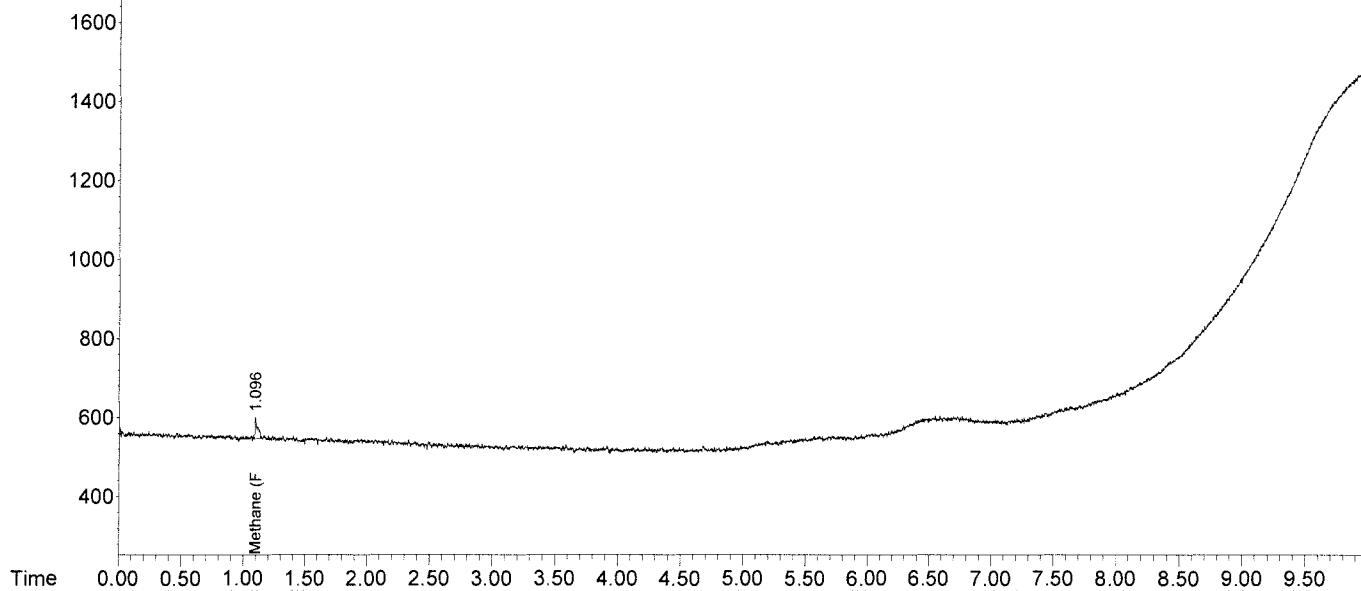
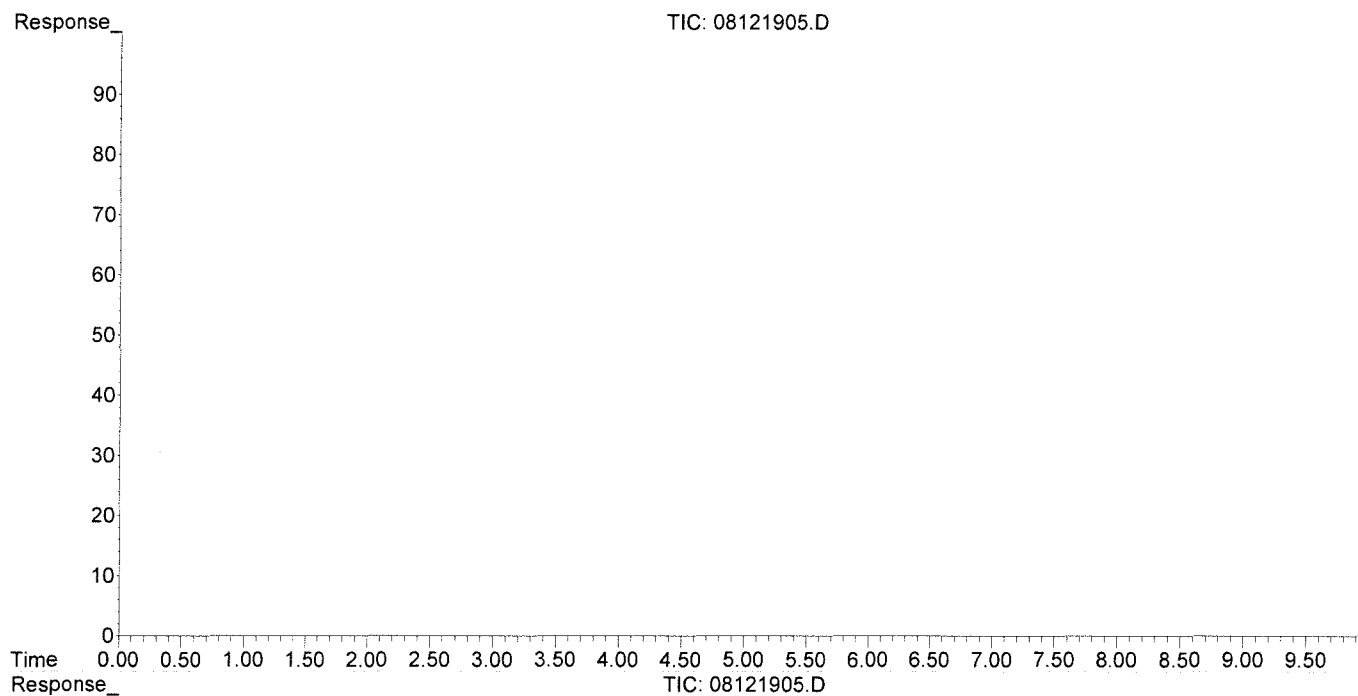
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2019_08\12\
Data File : 08121905.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Aug-2019, 12:17:24
Operator : WH
Sample : P1904674-002 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 12 15:52:05 2019
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

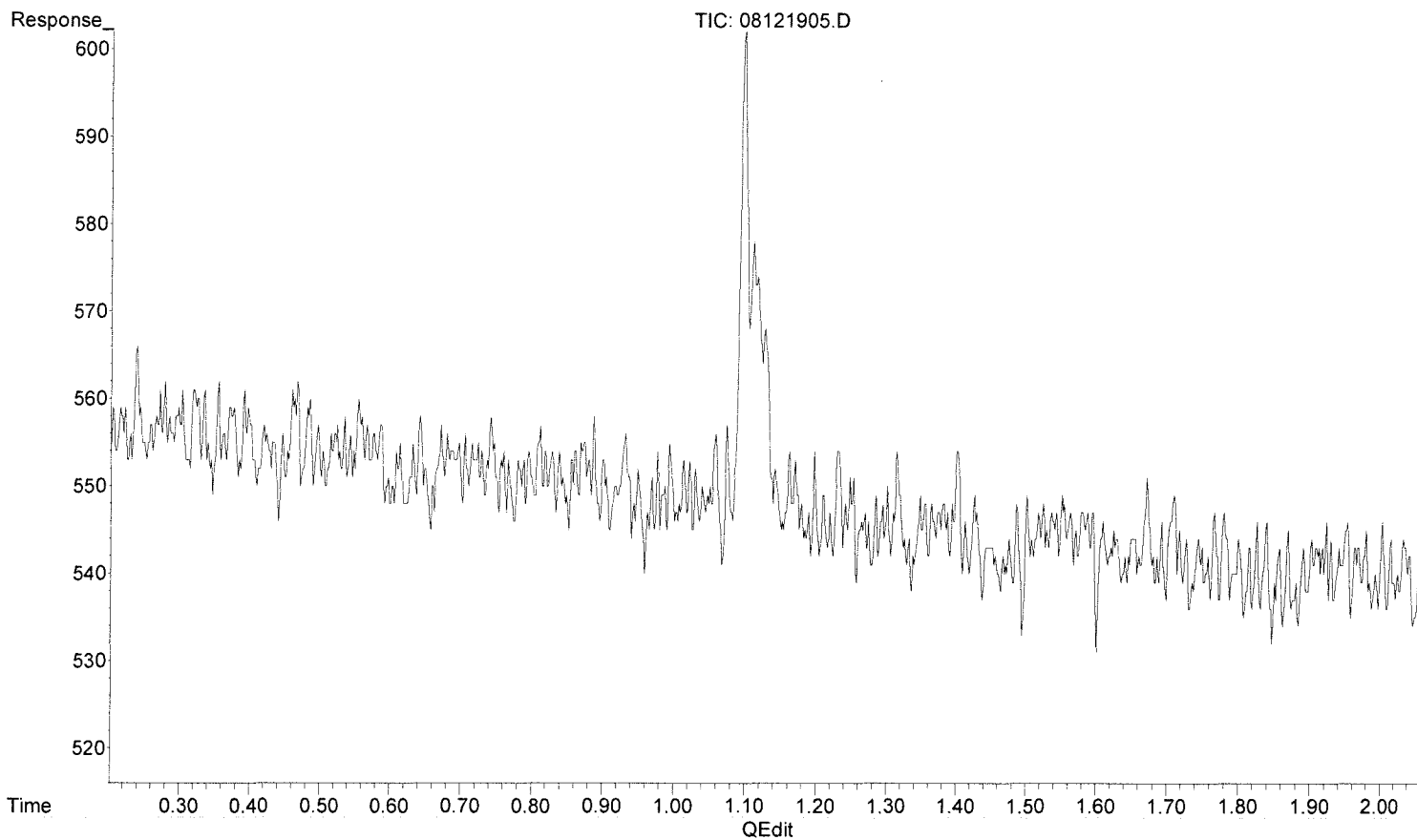
Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



Data Path : J:\GC10\DATA\RSK_FID\2019_08\12\
Data File : 08121905.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Aug-2019, 12:17:24
Operator : WH
Sample : P1904674-002 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 12 15:52:05 2019
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



(6) Methane (FID)

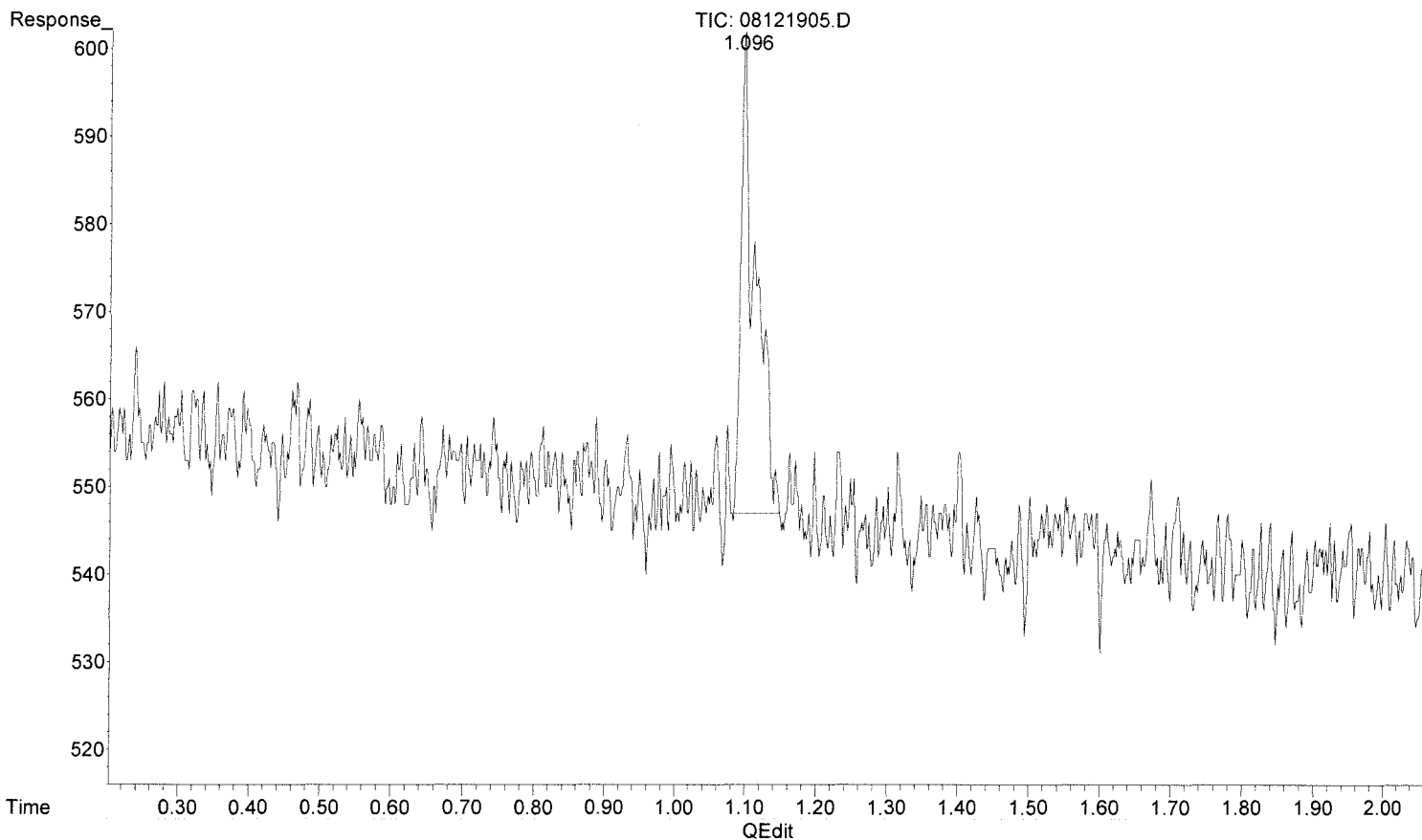
1.115min 0.000 ppm

response 0

Data Path : J:\GC10\DATA\RSK_FID\2019_08\12\
Data File : 08121905.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Aug-2019, 12:17:24
Operator : WH
Sample : P1904674-002 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 12 15:52:05 2019
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



(6) Methane (FID)
1.096min 0.088 ppm m
response 802

MR 8/13/19
WJ 8/13/19
AE
MP

Data Path : J:\GC10\DATA\RSK_FID\2019_08\12\
 Data File : 08121906.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 12-Aug-2019, 12:31:53
 Operator : WH
 Sample : P1904674-003 0.1ml
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Aug 12 15:52:33 2019
 Quant Method : I:\GC10\METHODS\RS091217_R.M
 Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 QLast Update : Wed Sep 13 11:14:47 2017
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :

Compound	R.T.	Response	Conc	Units

Target Compounds				
1) Oxygen/Argon	0.000	0	N.D.	ppm
2) Carbon monoxide	0.000	0	N.D.	ppm
3) Methane (TCD)	0.000	0	N.D.	ppm
4) Carbon dioxide	0.000	0	N.D.	ppm
6) Methane (FID)	1.113	743	0.082	ppm m
7) Ethylene	0.000	0	N.D.	ppm
8) Ethane	0.000	0	N.D.	ppm
9) Propylene	0.000	0	N.D.	ppm
10) Propane	0.000	0	N.D.	ppm
11) Isobutylene	0.000	0	N.D.	ppm
12) Isobutane	0.000	0	N.D.	ppm
13) n-Butane	0.000	0	N.D.	ppm

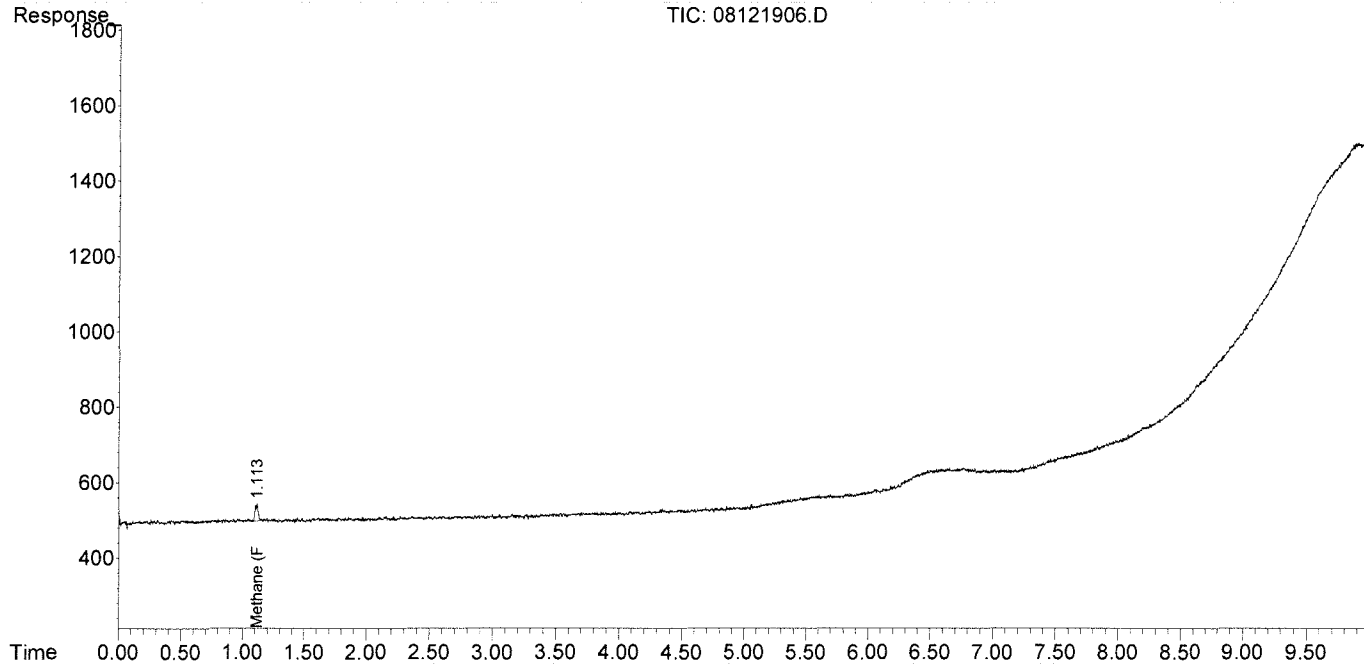
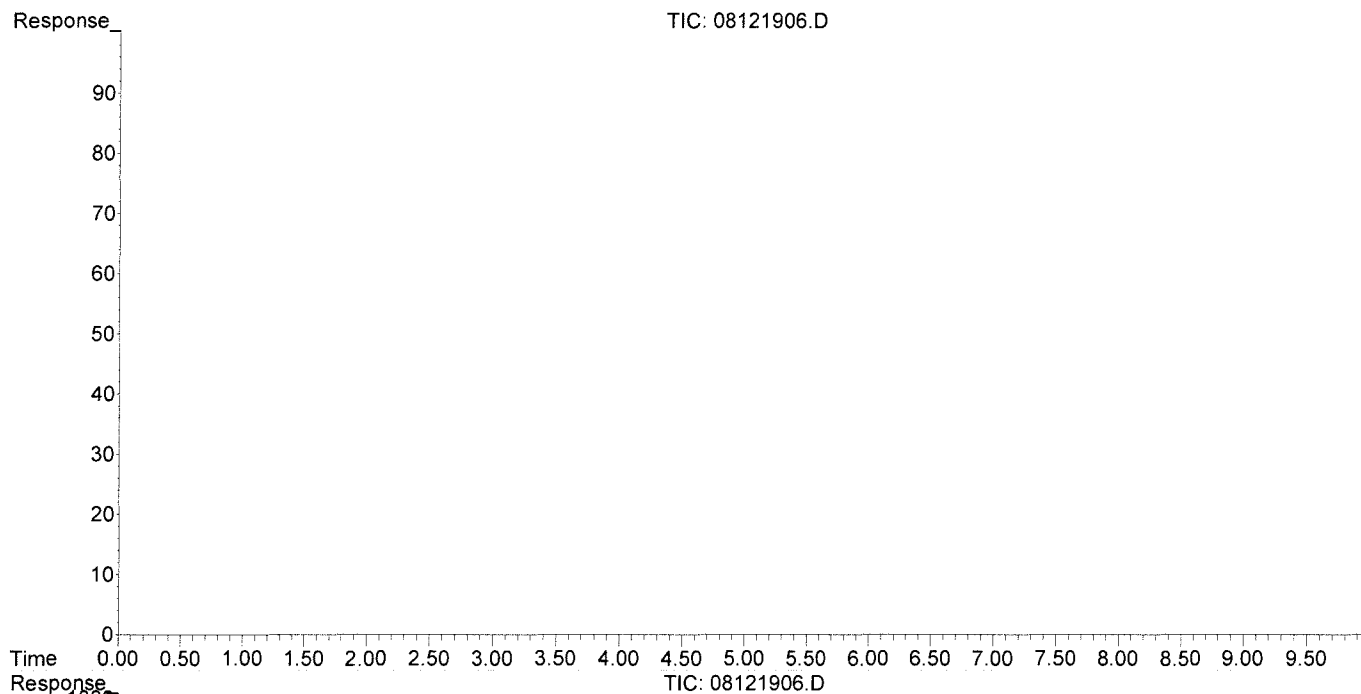
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2019_08\12\
Data File : 08121906.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Aug-2019, 12:31:53
Operator : WH
Sample : P1904674-003 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 12 15:52:33 2019
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

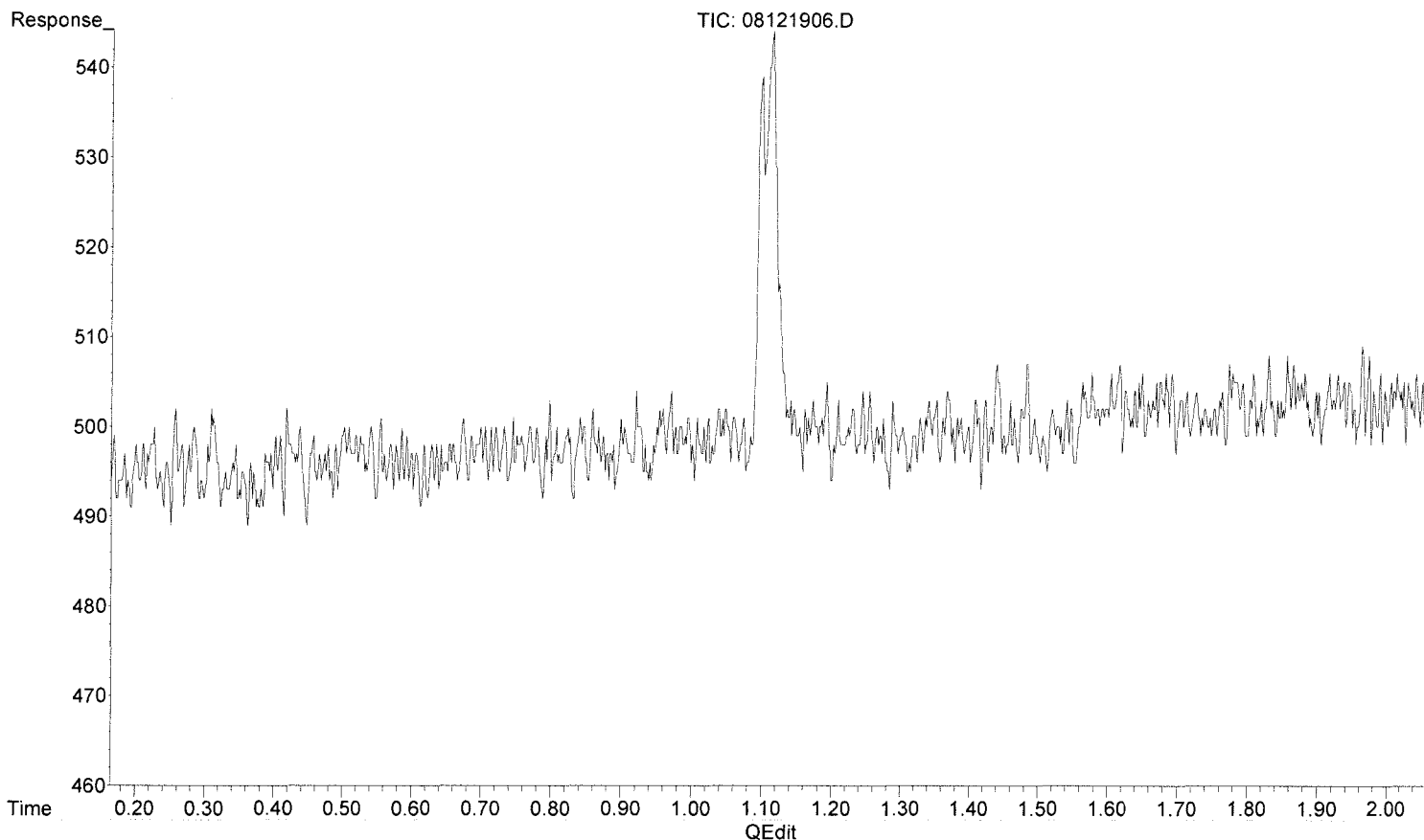
Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



Data Path : J:\GC10\DATA\RSK_FID\2019_08\12\
Data File : 08121906.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Aug-2019, 12:31:53
Operator : WH
Sample : P1904674-003 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 12 15:52:33 2019
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



(6) Methane (FID)

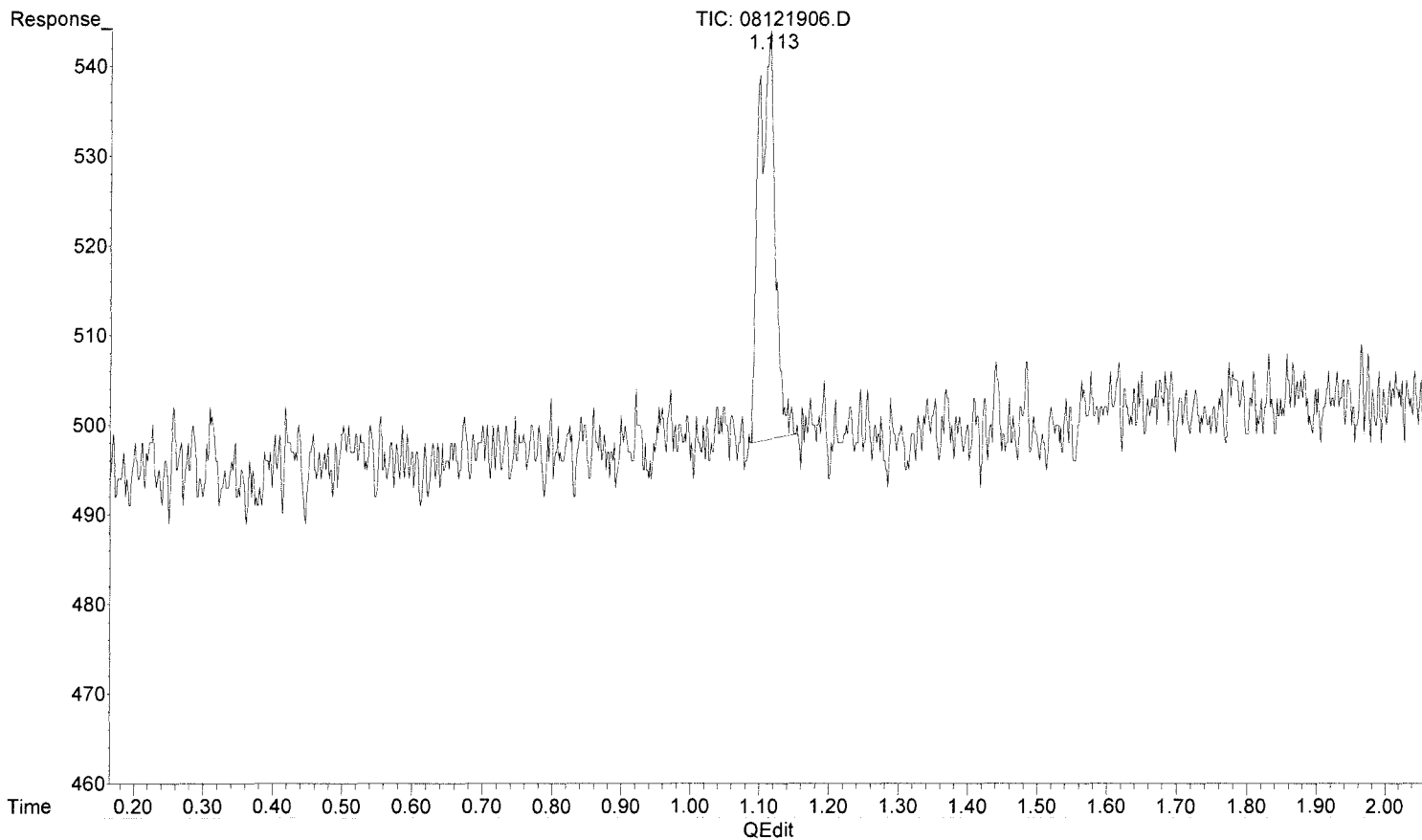
1.115min 0.000 ppm

response 0

Data Path : J:\GC10\DATA\RSK_FID\2019_08\12\
Data File : 08121906.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Aug-2019, 12:31:53
Operator : WH
Sample : P1904674-003 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 12 15:52:33 2019
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



(6) Methane (FID)

1.113min 0.082 ppm m

response 743

*MR
8/13/19*

*W. Sticks
m*

Data Path : J:\GC10\DATA\RSK_FID\2019_08\12\
 Data File : 08121907.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 12-Aug-2019, 12:47:55
 Operator : WH
 Sample : P1904674-004 0.1ml
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Aug 12 15:53:13 2019
 Quant Method : I:\GC10\METHODS\RS091217_R.M
 Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 QLast Update : Wed Sep 13 11:14:47 2017
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :

Compound	R.T.	Response	Conc	Units

Target Compounds				
1) Oxygen/Argon	0.000	0	N.D.	ppm
2) Carbon monoxide	0.000	0	N.D.	ppm
3) Methane (TCD)	0.000	0	N.D.	ppm
4) Carbon dioxide	0.000	0	N.D.	ppm
6) Methane (FID)	0.000	0	N.D.	ppm
7) Ethylene	0.000	0	N.D.	ppm
8) Ethane	0.000	0	N.D.	ppm
9) Propylene	0.000	0	N.D.	ppm
10) Propane	0.000	0	N.D.	ppm
11) Isobutylene	0.000	0	N.D.	ppm
12) Isobutane	0.000	0	N.D.	ppm
13) n-Butane	0.000	0	N.D.	ppm

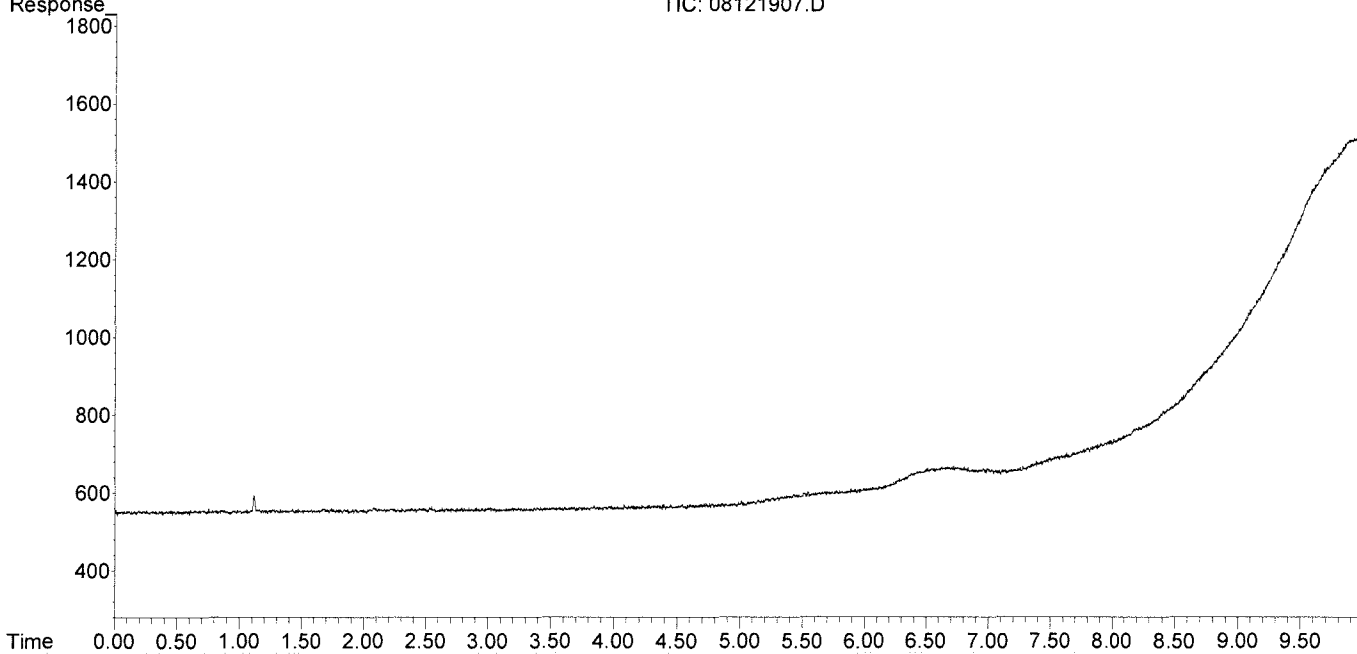
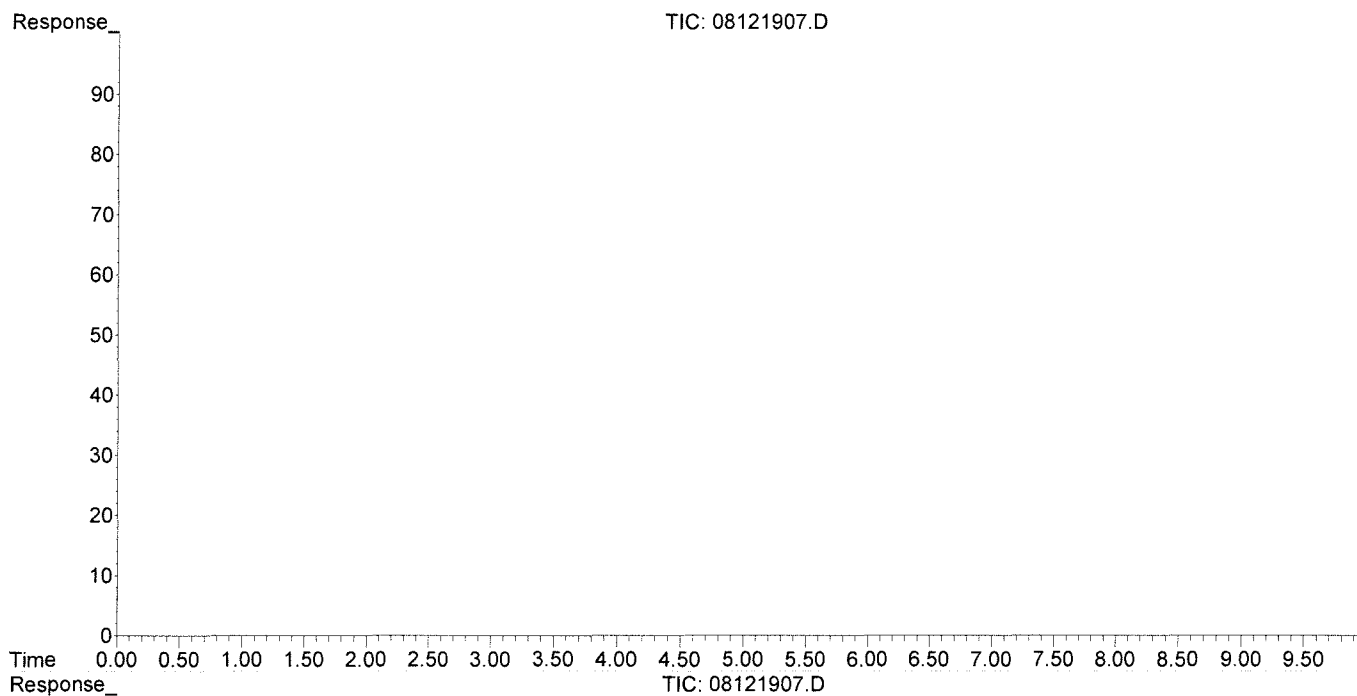
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2019_08\12\
Data File : 08121907.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Aug-2019, 12:47:55
Operator : WH
Sample : P1904674-004 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 12 15:53:13 2019
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



Data Path : J:\GC10\DATA\RSK_FID\2019_08\12\
 Data File : 08121903.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 12-Aug-2019, 11:31:44
 Operator : WH
 Sample : MCS 0.1ml
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Aug 12 15:51:13 2019
 Quant Method : I:\GC10\METHODS\RS091217_R.M
 Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 QLast Update : Wed Sep 13 11:14:47 2017
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :

Compound	R.T.	Response	Conc	Units

Target Compounds				
1) Oxygen/Argon	0.000	0	N.D.	ppm
2) Carbon monoxide	0.000	0	N.D.	ppm
3) Methane (TCD)	0.000	0	N.D.	ppm
4) Carbon dioxide	0.000	0	N.D.	ppm
6) Methane (FID)	1.106	620	0.068	ppm m
7) Ethylene	0.000	0	N.D.	ppm
8) Ethane	0.000	0	N.D.	ppm
9) Propylene	0.000	0	N.D.	ppm
10) Propane	0.000	0	N.D.	ppm
11) Isobutylene	0.000	0	N.D.	ppm
12) Isobutane	0.000	0	N.D.	ppm
13) n-Butane	0.000	0	N.D.	ppm

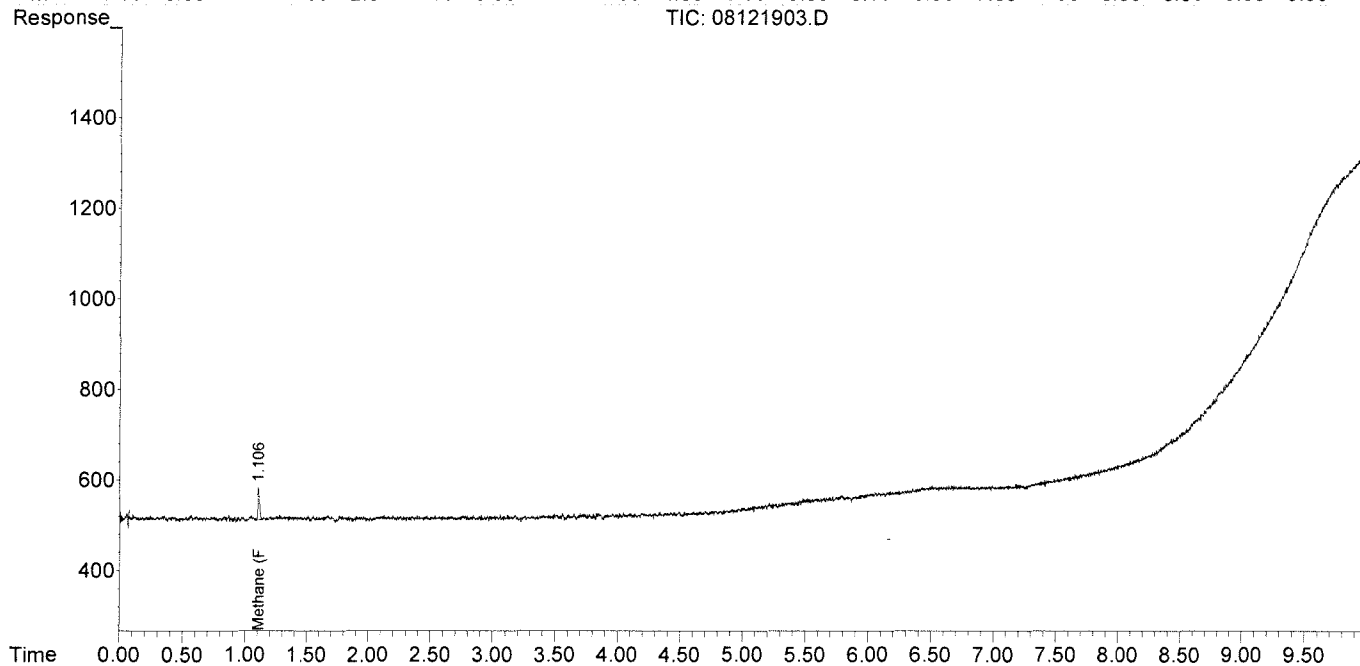
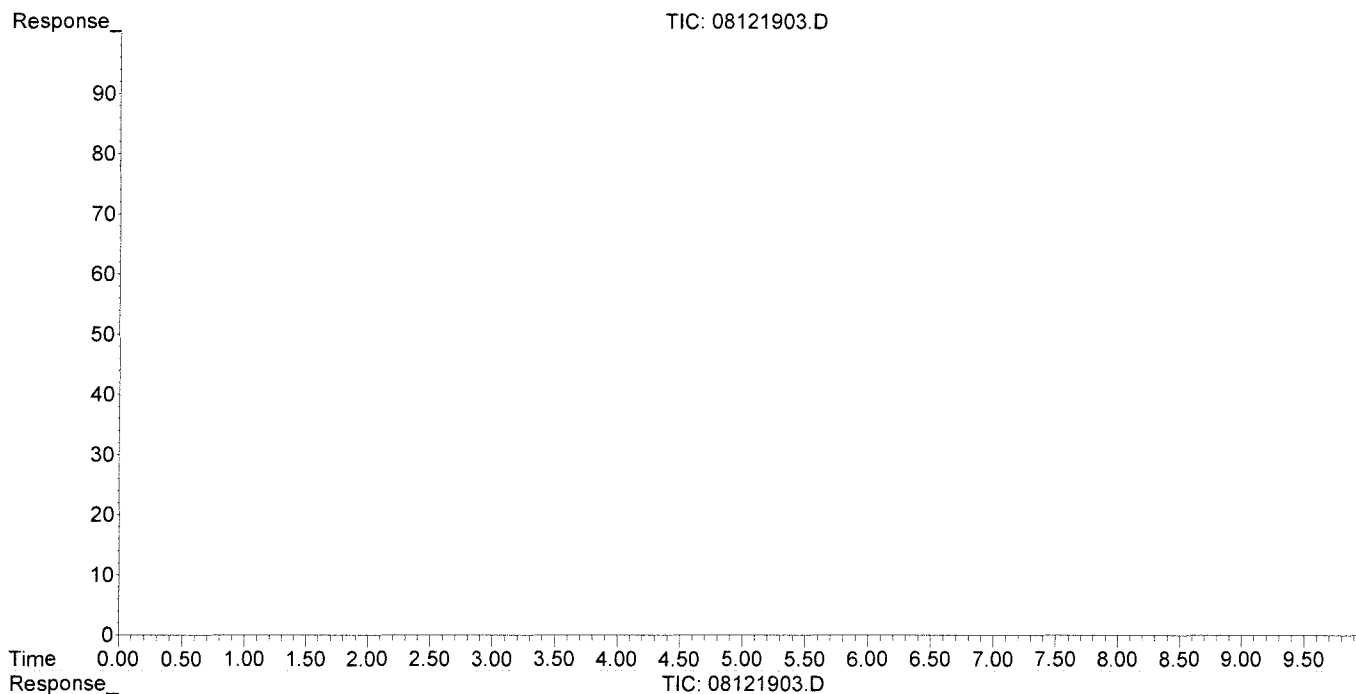
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2019_08\12\
Data File : 08121903.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Aug-2019, 11:31:44
Operator : WH
Sample : MCS 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 12 15:51:13 2019
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

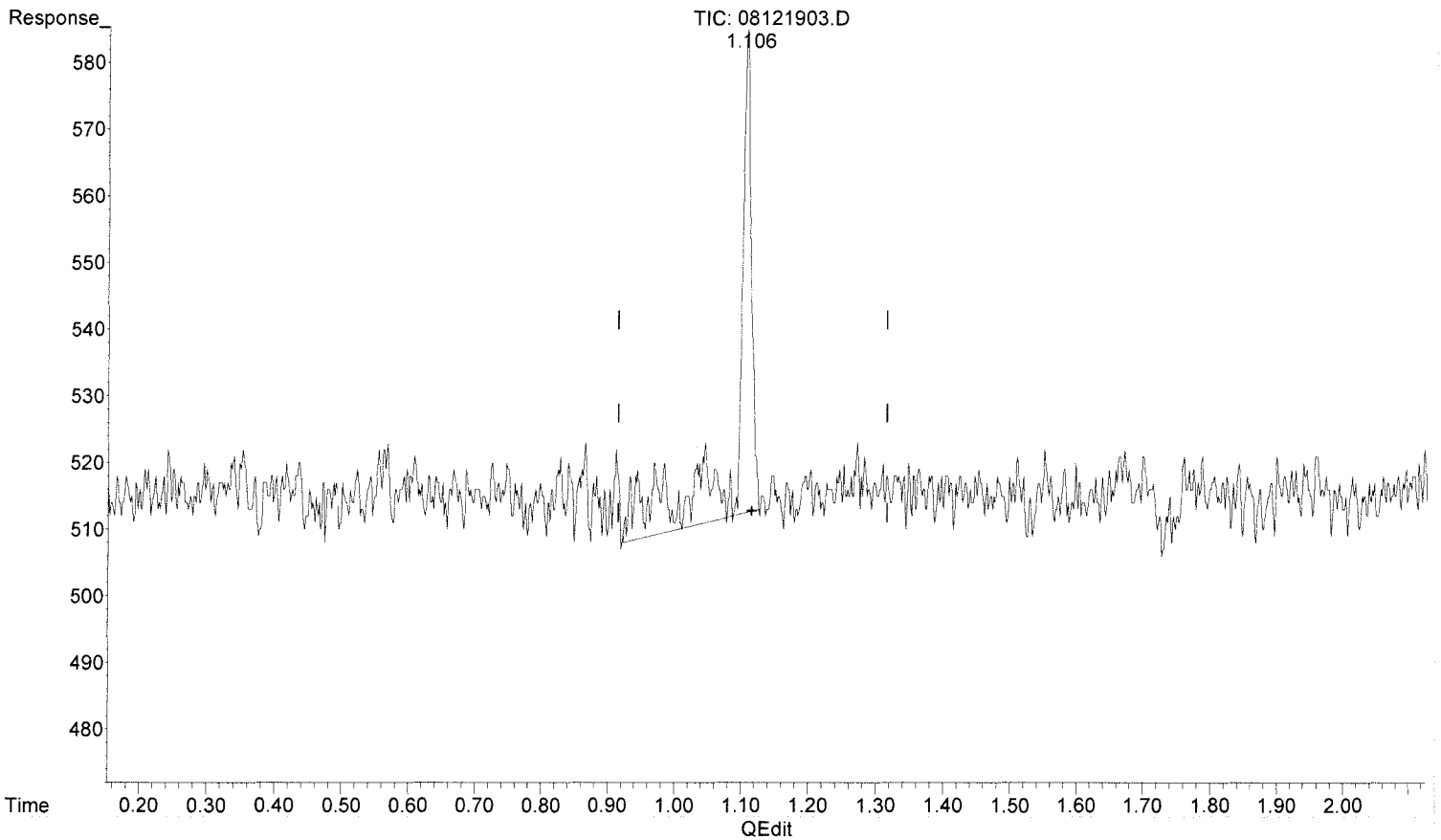
Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



Data Path : J:\GC10\DATA\RSK_FID\2019_08\12\
Data File : 08121903.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Aug-2019, 11:31:44
Operator : WH
Sample : MCS 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 12 15:51:13 2019
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



(6) Methane (FID)

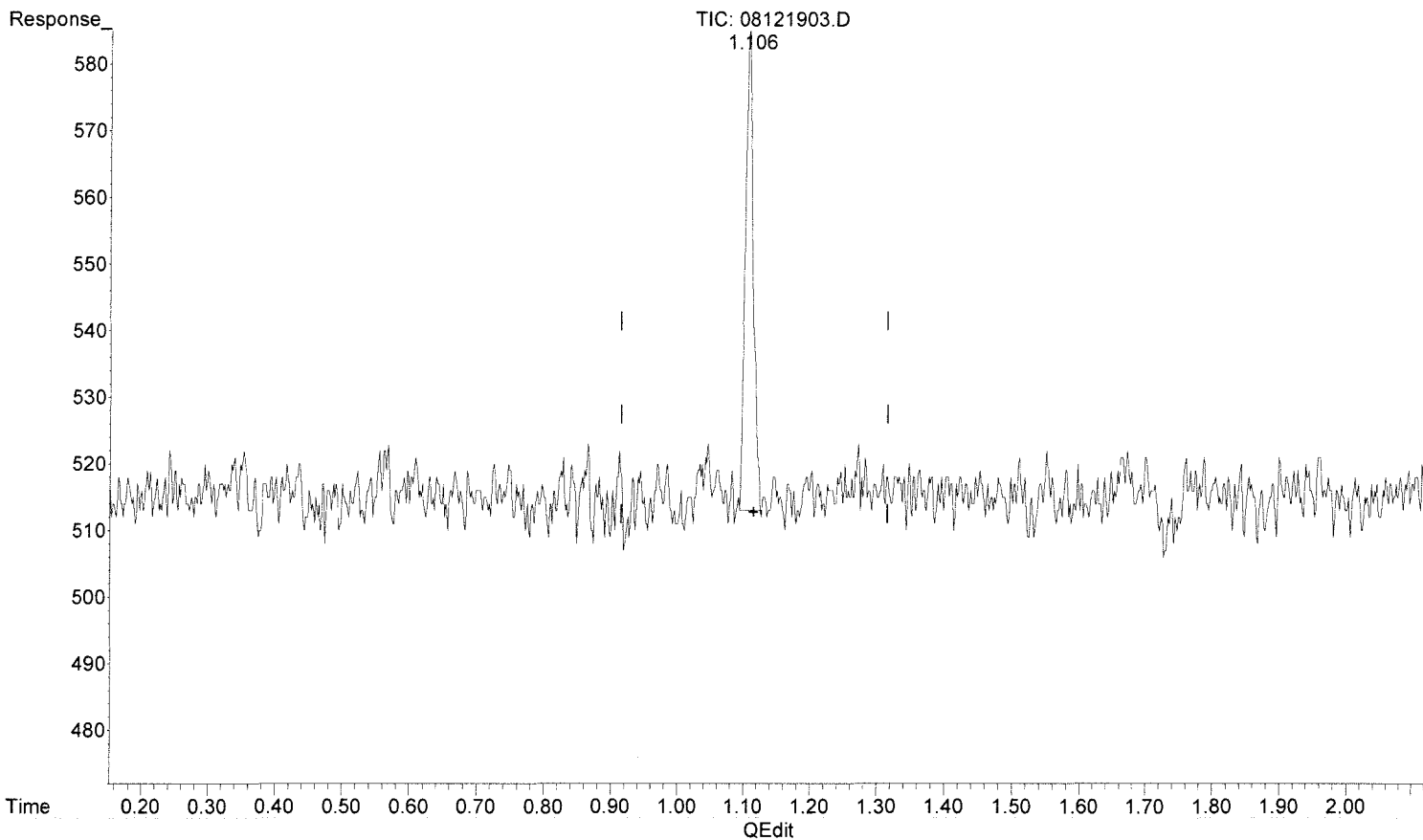
1.107min 0.123 ppm

response 1119

Data Path : J:\GC10\DATA\RSK_FID\2019_08\12\
Data File : 08121903.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Aug-2019, 11:31:44
Operator : WH
Sample : MCS 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 12 15:51:13 2019
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



(6) Methane (FID)
1.106min 0.068 ppm m
response 620

MR
8/13/19
Wright
BCC

Data Path : J:\GC10\DATA\RSK_FID\2019_08\12\
 Data File : 08121908.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 12-Aug-2019, 13:14:38
 Operator : WH
 Sample : LCS FID
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Aug 12 14:53:32 2019
 Quant Method : I:\GC10\METHODS\RS091217_R.M
 Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 QLast Update : Wed Sep 13 11:14:47 2017
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :

Compound	R.T.	Response	Conc	Units

Target Compounds				
1) Oxygen/Argon	0.000	0	N.D.	ppm
2) Carbon monoxide	0.000	0	N.D.	ppm
3) Methane (TCD)	0.000	0	N.D.	ppm
4) Carbon dioxide	0.000	0	N.D.	ppm
6) Methane (FID)	1.112	12754	1.406	ppm
7) Ethylene	1.672	16628	0.994	ppm
8) Ethane	1.934	20571	1.214	ppm
9) Propylene	4.310	22197	0.947	ppm
10) Propane	4.431	31672	1.273	ppm
11) Isobutylene	0.000	0	N.D.	ppm
12) Isobutane	6.648	42545	1.598	ppm
13) n-Butane	6.648	42545	1.598	ppm

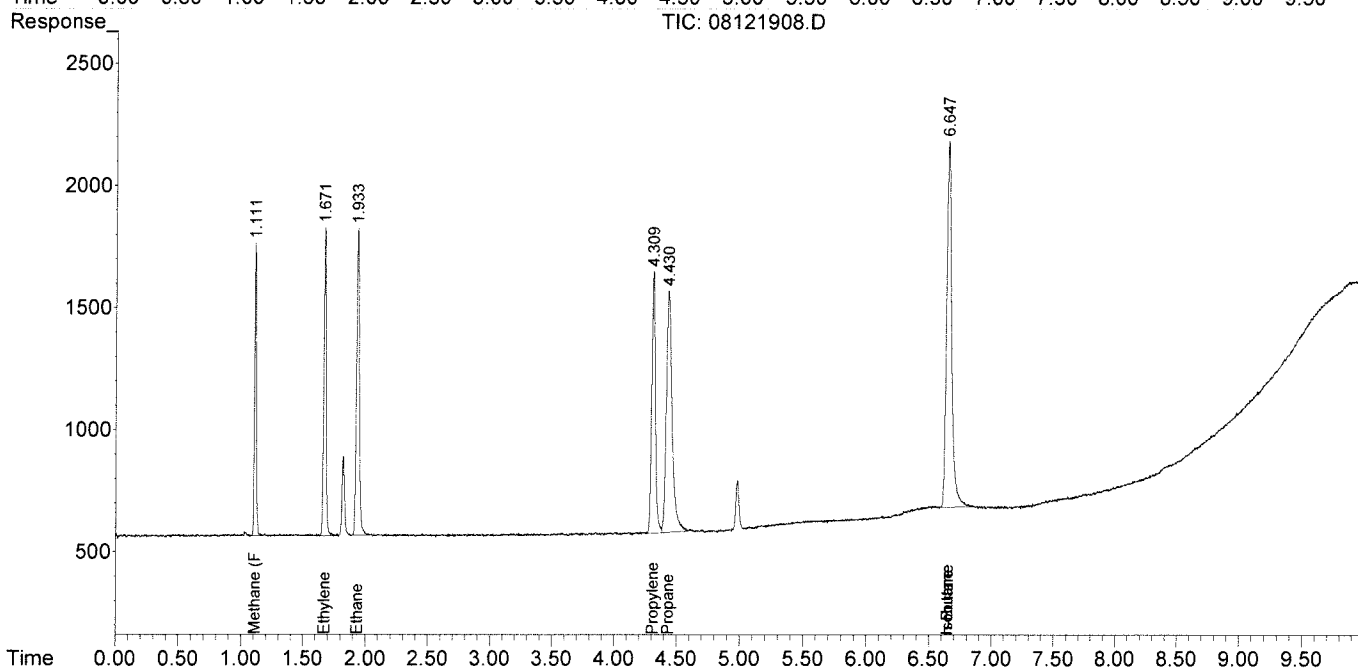
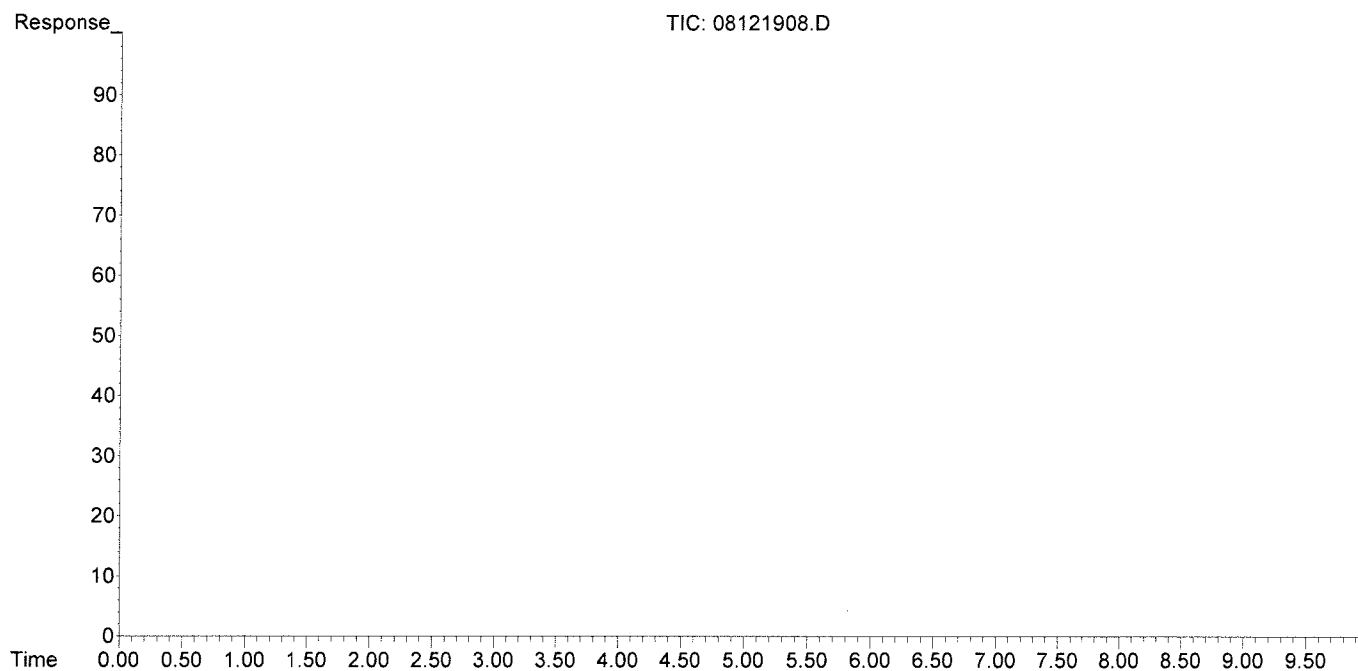
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2019_08\12\
 Data File : 08121908.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 12-Aug-2019, 13:14:38
 Operator : WH
 Sample : LCS FID
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Aug 12 14:53:32 2019
 Quant Method : I:\GC10\METHODS\RS091217_R.M
 Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 QLast Update : Wed Sep 13 11:14:47 2017
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :



Data Path : J:\GC10\DATA\RSK_FID\2019_08\12\
 Data File : 08121909.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 12-Aug-2019, 13:34:04
 Operator : WH
 Sample : LCSD FID
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Aug 12 14:53:44 2019
 Quant Method : I:\GC10\METHODS\RS091217_R.M
 Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 QLast Update : Wed Sep 13 11:14:47 2017
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :

Compound	R.T.	Response	Conc	Units

Target Compounds				
1) Oxygen/Argon	0.000	0	N.D.	ppm
2) Carbon monoxide	0.000	0	N.D.	ppm
3) Methane (TCD)	0.000	0	N.D.	ppm
4) Carbon dioxide	0.000	0	N.D.	ppm
6) Methane (FID)	1.111	12085	1.332	ppm m
7) Ethylene	1.674	16672	0.996	ppm
8) Ethane	1.935	21290	1.256	ppm
9) Propylene	4.311	22644	0.966	ppm
10) Propane	4.434	32636	1.312	ppm
11) Isobutylene	0.000	0	N.D.	ppm
12) Isobutane	6.648	44984	1.690	ppm
13) n-Butane	6.648	44984	1.690	ppm

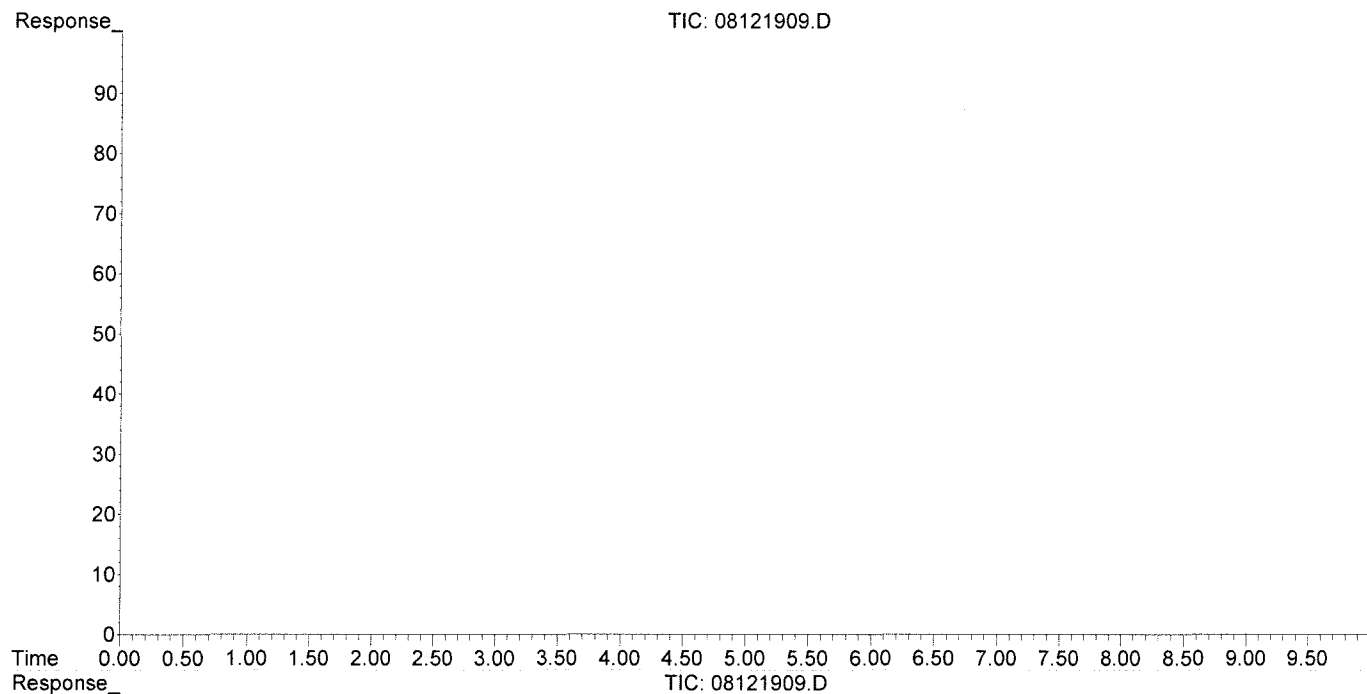
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2019_08\12\
Data File : 08121909.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Aug-2019, 13:34:04
Operator : WH
Sample : LCSD FID
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 12 14:53:44 2019
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

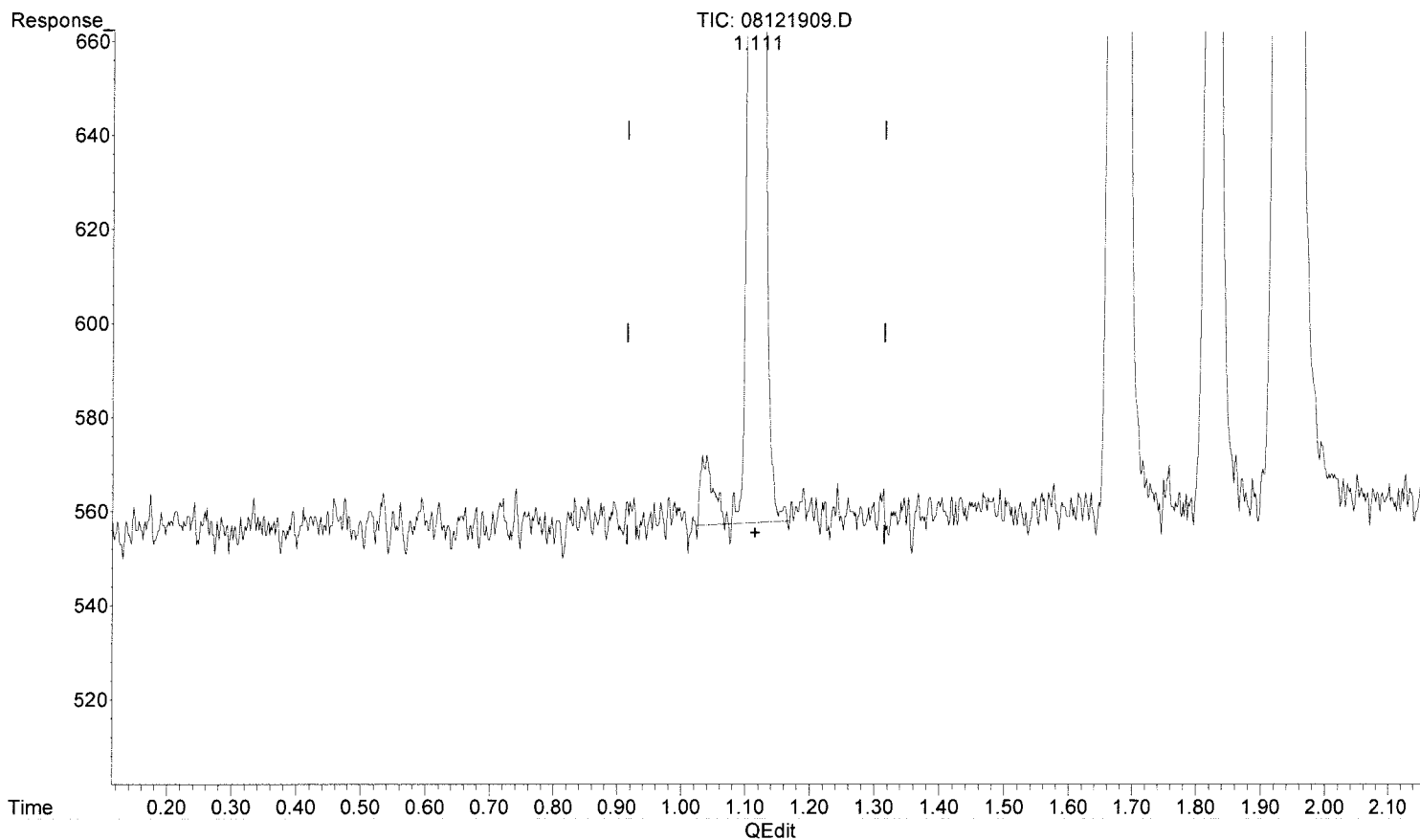
Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



Data Path : J:\GC10\DATA\RSK_FID\2019_08\12\
Data File : 08121909.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Aug-2019, 13:34:04
Operator : WH
Sample : LCSD FID
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 12 14:53:44 2019
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



(6) Methane (FID)

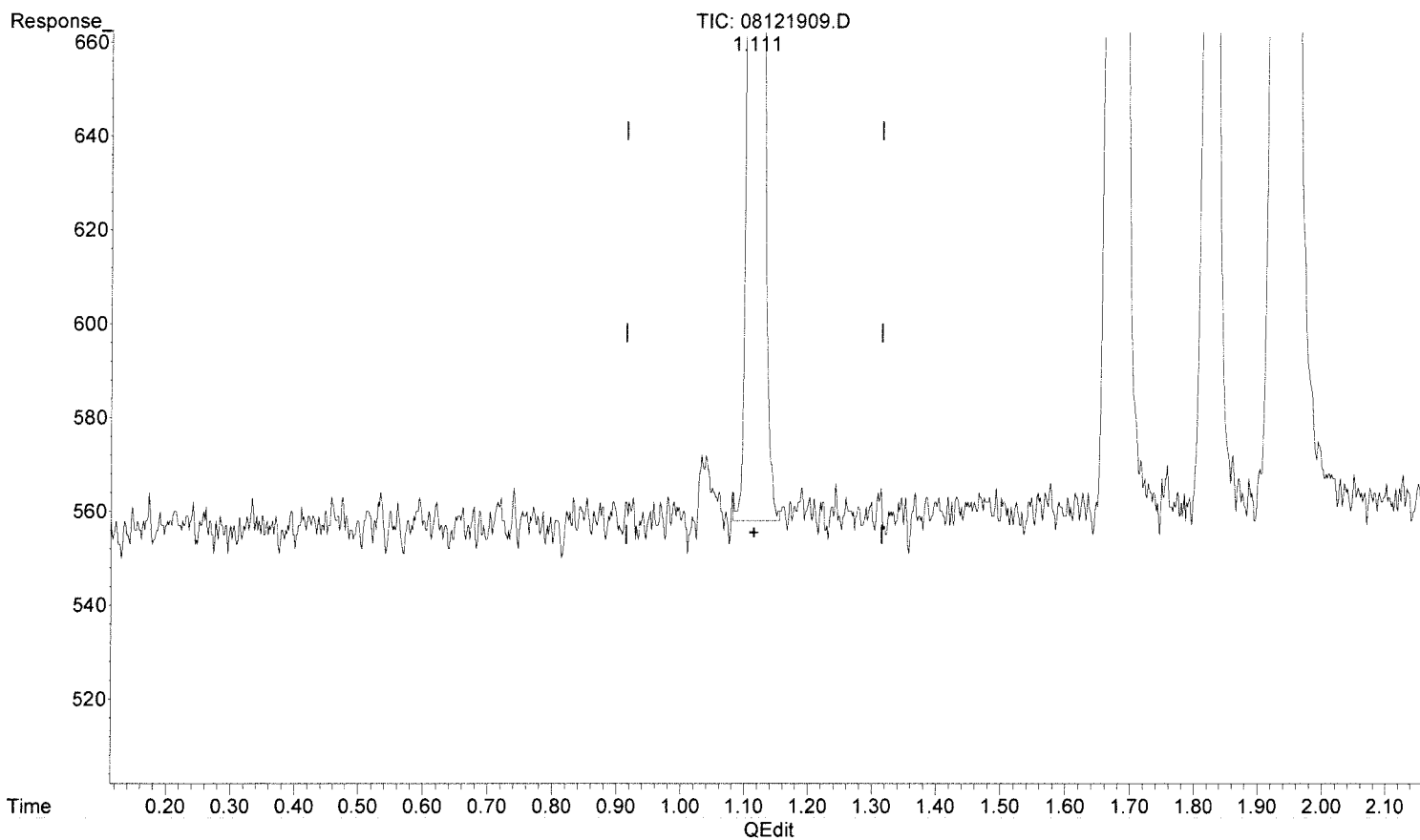
1.112min 1.359 ppm

response 12325

Data Path : J:\GC10\DATA\RSK_FID\2019_08\12\
Data File : 08121909.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Aug-2019, 13:34:04
Operator : WH
Sample : LCSD FID
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 12 14:53:44 2019
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



(6) Methane (FID)
1.111min 1.332 ppm m
response 12085

MR
8/13/19

WJH
8/12/19
PUC

Method Path : J:\GC10\METHODS\
 Method File : RS091217_R.M
 Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 Last Update : Wed Sep 13 11:14:47 2017
 Response Via : Initial Calibration

Calibration Files

1 =09121702.D 2 =09121703.D 3 =09121704.D
 4 =09121705.D 5 =09121706.D 6 =09121707.D

Compound	1	2	3	4	5	6	Avg	%RSD
1) Oxygen/Argon	3.739		1.014			0.001	0.793 E6	189.17
2) Carbon monoxide	3.739		1.014			0.001	0.594 E6	221.92
3) Methane (TCD)						2.161	0.951 E2	106.37
4) Carbon dioxide	2.365	2.569	2.558	2.361	2.459	2.314	2.438 E2	4.44

Signal #2 Calibration Files

1 =09121702.D 2 =09121703.D 3 =09121704.D
 4 =09121705.D 5 =09121706.D 6 =09121707.D

Compound	1	2	3	4	5	6	Avg	%RSD
6) Methane (FID)		1.180	0.975	0.908	0.870	0.868	0.907 E4	11.66
7) Ethylene	1.736	1.638	1.780	1.720	1.628	1.670	1.673 E4	3.90
8) Ethane	1.781	1.676	1.784	1.730	1.692	1.675	1.695 E4	3.83
9) Propylene	2.505	2.296	2.592	2.480	2.346	2.252	2.343 E4	6.56
10) Propane	2.439	2.283	2.645	2.555	2.433	2.522	2.488 E4	4.20
11) Isobutylene							0.652 E1	138.46
12) Isobutane	6.058	4.793	2.214	1.553	1.353		2.662 E4	86.17
13) n-Butane	6.058	4.793	2.214	1.553	1.353		2.662 E4	86.17

(#) = Out of Range ### Number of calibration levels exceeded format ###

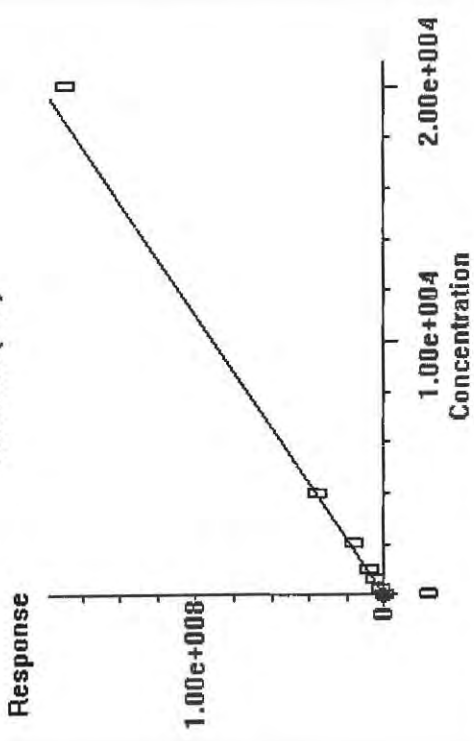
RS091217_R.M Wed Sep 13 15:11:48 2017

Edit Compounds -- Compound #6 -- Methane (FID)

Search by: Ret Time Name Index Find Compound

Compound Database		Identification		Calibration		User-Defined		Advanced		Reporting	
External Standard Compound											
Lvl ID	Concentration	Response	Lvl ID	Concentration	Response	Lvl ID	Concentration	Response	Lvl ID	Concentration	Response
1	0.151000		1	0.151000		11	20000.000000	1690009160.49199			
2	0.302000	3564.400000	2	0.302000	3564.400000						
3	1.510000	14725.266625	3	1.510000	14725.266625						
4	4.530000	41128.575000	4	4.530000	41128.575000						
5	10.570000	91966.784531	5	10.570000	91966.784531						
6	200.000000	1735997.497500	6	200.000000	1735997.497500						
7	600.000000	5189848.900000	7	600.000000	5189848.900000						
8	1000.000000	8598533.570000	8	1000.000000	8598533.570000						
9	2000.000000	16098208.390000	9	2000.000000	16098208.390000						
10	4000.000000	35776839.311352	10	4000.000000	35776839.311352						

Methane (FID)



0.000e+000	Quadratic term
9.071e+003	Linear term
0.000e+000	Constant term
11.657%	RF Rel Std Dev

OK Cancel Help Print Calibration Curve Copy Calibration Curve

Search by: Ret Time

Compound Database
External Standard Compound

- Oxygen/Argon
- Carbon monoxide
- Methane (TCD)
- Carbon dioxide
- Signal #2
- Methane (FID)
- Ethylene
- Ethane
- Propylene
- Propane
- Isobutylene
- Isobutane
- n-Butane

Name

Calibration User-Defined | Advanced | Reporting

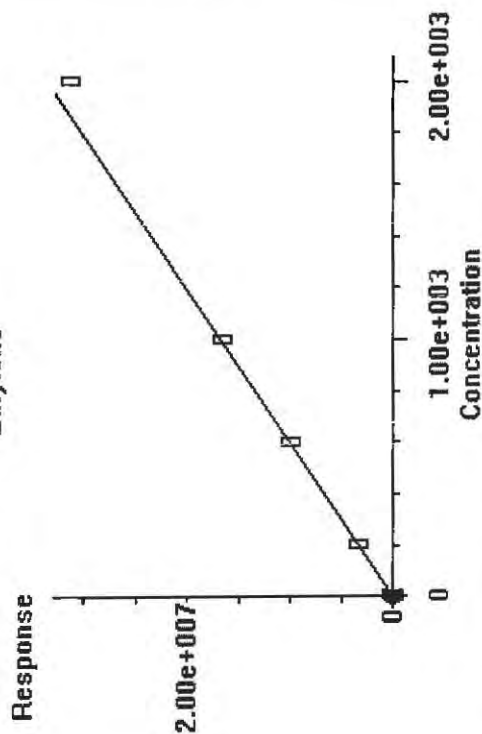
Index

Find Compound

Lvl ID	Concentration	Response
1	0.151000	2621.970000
2	0.302000	4946.731301
3	1.510000	26884.746847
4	4.530000	77902.721497
5	10.570000	172085.529560
6	200.000000	3339702.313219
7	600.000000	10007758.776971
8	1000.000000	16606503.805988
9	2000.000000	31192443.898600
10	4000.000000	

Lvl ID	Concentration	Response
11	20000.000000	

Ethylene



0.000e+000 Quadratic term
1.673e+004 Linear term
0.000e+000 Constant term
3.897% RF Rel Std Dev

OK

Cancel

Help

Print Calibration Curve

Copy Calibration Curve

Search by Rel Time

Name

Index

Find Compound

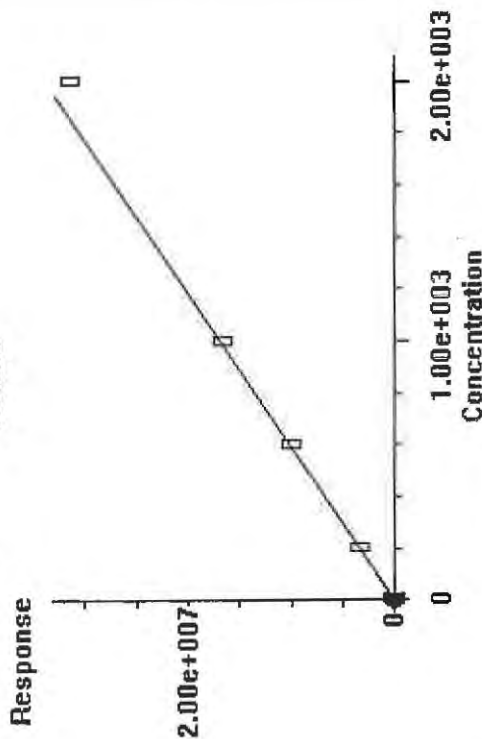
Compound Database
External Standard Compound

- Oxygen/Argon
- Carbon monoxide
- Methane (TCD)
- Carbon dioxide
- Signal #2
- Methane (FID)
- Ethane
- Propylene
- Propane
- Isobutylene
- Isobutane
- n-Butane

Identification Calibration User-Defined Advanced Reporting

Lvl ID	Concentration	Response	Lvl ID	Concentration	Response
1	0.151000	2689.928008	11	20000.000000	
2	0.302000	5060.331943			
3	1.510000	26943.657500			
4	4.530000	79353.525045			
5	10.570000	178840.731148			
6	200.000000	3350442.319129			
7	600.000000	10048964.218029			
8	1000.000000	16709164.879012			
9	2000.000000	31424217.938900			
10	4000.000000				

Ethane



0.000e+000	Quadratic term
1.695e+004	Linear term
0.000e+000	Constant term
3.831%	RF Rel Std Dev

OK

Cancel

Help

Print Calibration Curve

Copy Calibration Curve

Search by Ret Time

Name

Index

Find Compound

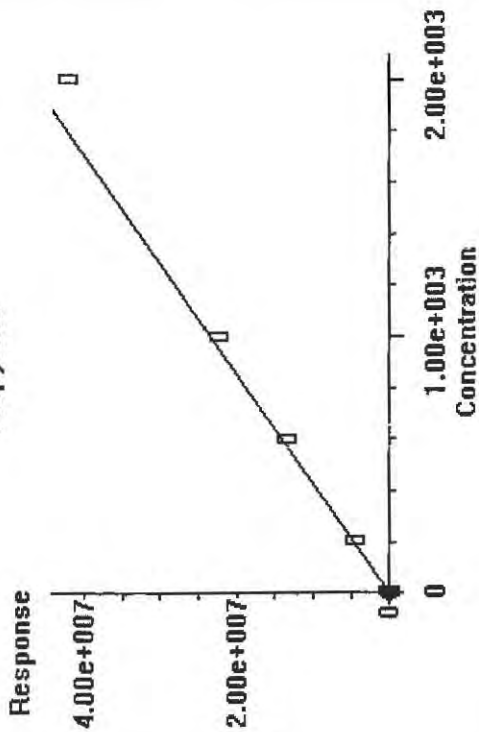
Compound Database
External Standard Compound

Identification Calibration User-Defined Advanced Reporting

- Oxygen/Argon
- Carbon monoxide
- Methane (TCD)
- Carbon dioxide
- Signal #2
- Methane (FID)
- Ethylene
- Ethane
- Propylene
- Propane
- Isobutylene
- Isobutane
- n-Butane

Lvl ID	Concentration	Response	Lvl ID	Concentration	Response
1	0.151000	3782.537646	11	20000.000000	
2	0.302000	6933.285530			
3	1.510000	39139.518208			
4	4.530000	112341.896872			
5	10.570000	248003.903623			
6	200.000000	4504060.086084			
7	600.000000	13569342.761419			
8	1000.000000	22494887.720990			
9	2000.000000	42124689.656800			
10	4000.000000				

Propylene



0.000e+000	Quadratic term
2.343e+004	Linear term
0.000e+000	Constant term
6.559%	RF Rel Std Dev

OK

Cancel

Help

Print Calibration Curve

Copy Calibration Curve

Search by Ret Time

Compound Database
External Standard Compound

- Oxygen/Argon
- Carbon monoxide
- Methane (TCD)
- Carbon dioxide
- Signal #2
- Methane (FID)
- Ethylene
- Ethane
- Propylene
- Propane
- Isobutylene
- Isobutane
- n-Butane

Name

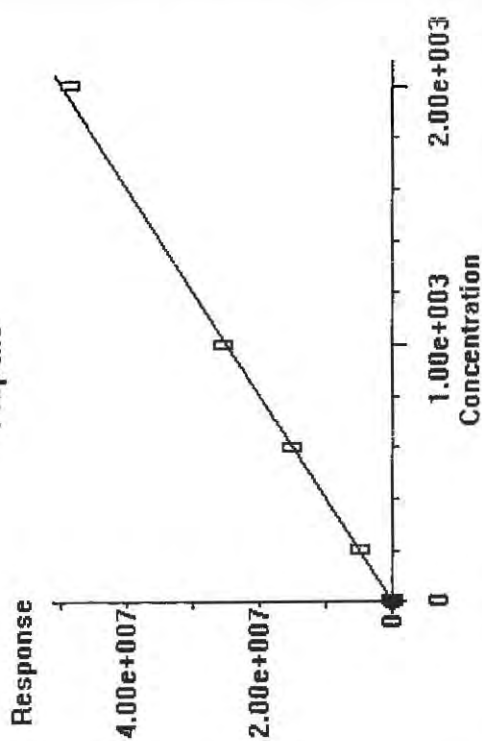
Calibration | User-Defined | Advanced | Reporting

Index

Find Compound

Lvl ID	Concentration	Response	Lvl ID	Concentration	Response
1	0.151000	3682.897354	11	20000.000000	
2	0.302000	6894.237803			
3	1.510000	39934.166792			
4	4.530000	115723.428128			
5	10.570000	257124.432806			
6	200.000000	5043035.663316			
7	600.000000	15251325.797404			
8	1000.000000	25459410.657938			
9	2000.000000	48583085.287451			
10	4000.000000				

Propane



0.000e+000	Quadratic term
2.488e+004	Linear term
0.000e+000	Constant term
4.200%	RF Rel Std Dev

OK

Cancel

Help

Print Calibration Curve

Copy Calibration Curve

Method Path : J:\GC10\METHODS\
 Method File : RS091217_R.M
 Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 Last Update : Wed Sep 13 11:14:47 2017
 Response Via : Initial Calibration

#	ID	Conc	ISTD Conc	Path\File
1	1	0	0	J:\GC10\DATA\RSK_FID\2017_09\12\09121702.D
2	2	0	0	J:\GC10\DATA\RSK_FID\2017_09\12\09121703.D
3	3	3	0	J:\GC10\DATA\RSK_FID\2017_09\12\09121704.D
4	4	10	0	J:\GC10\DATA\RSK_FID\2017_09\12\09121705.D
5	5	25	0	J:\GC10\DATA\RSK_FID\2017_09\12\09121706.D
6	6	125	0	J:\GC10\DATA\RSK_FID\2017_09\12\09121707.D
7	7	5000	0	J:\GC10\DATA\RSK_FID\2017_09\12\09121708.D
8	8	25000	0	J:\GC10\DATA\RSK_FID\2017_09\12\09121709.D
9	9	2000	0	J:\GC10\DATA\RSK_FID\2017_09\12\09121710.D
10	10	30000	0	J:\GC10\DATA\RSK_FID\2017_09\12\09121711.D
11	11	20000	0	J:\GC10\DATA\RSK_FID\2017_09\12\09121712.D

#	ID	Update Time	Quant Time	Acquisition Time
1	1	Sep 13 11:04 2017	Sep 12 15:03 2017	12-Sep-2017, 10:52
2	2	Sep 13 11:05 2017	Sep 13 11:05 2017	12-Sep-2017, 11:05
3	3	Sep 13 11:06 2017	Sep 13 11:05 2017	12-Sep-2017, 11:45
4	4	Sep 13 11:09 2017	Sep 13 11:06 2017	12-Sep-2017, 12:09
5	5	Sep 13 11:09 2017	Sep 13 11:09 2017	12-Sep-2017, 12:30
6	6	Sep 13 11:10 2017	Sep 13 11:10 2017	12-Sep-2017, 12:47
7	7	Sep 13 11:11 2017	Sep 13 11:10 2017	12-Sep-2017, 13:00
8	8	Sep 13 11:12 2017	Sep 13 11:11 2017	12-Sep-2017, 13:47
9	9	Sep 13 11:12 2017	Sep 13 11:12 2017	12-Sep-2017, 14:07
10	10	Sep 13 11:14 2017	Sep 13 11:13 2017	12-Sep-2017, 14:48
11	11	Sep 13 11:14 2017	Sep 13 11:14 2017	12-Sep-2017, 15:21

RS091217_R.M Wed Sep 13 15:11:22 2017

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
 Data File : 09121702.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 12-Sep-2017, 10:52
 Operator : MC
 Sample : 0.151ppm 0.250ml s32-09121702
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Sep 12 11:03:15 2017
 Quant Method : I:\GC10\METHODS\RS082417.M
 Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 QLast Update : Fri Aug 25 09:19:14 2017
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :

Compound	R.T.	Response	Conc	Units

Target Compounds				
1) Oxygen/Argon	1.767	373920	0.128	ppm
2) Carbon monoxide	1.767	373920	N.D.	ppm
3) Methane (TCD)	0.000	0	N.D.	ppm
4) Carbon dioxide	0.000	0	N.D.	ppm
6) Methane (FID)	0.000	0	N.D.	ppm d
7) Ethylene	1.595	2622	0.156	ppm
8) Ethane	1.848	2690	0.156	ppm
9) Propylene	4.222	3783	0.154	ppm
10) Propane	4.348	3683	0.139	ppm
11) Isobutylene	0.000	0	N.D.	ppm
12) Isobutane	6.582f	6058	NoCal	ppm
13) n-Butane	6.582f	6058	NoCal	ppm

(f)=RT Delta > 1/2 Window

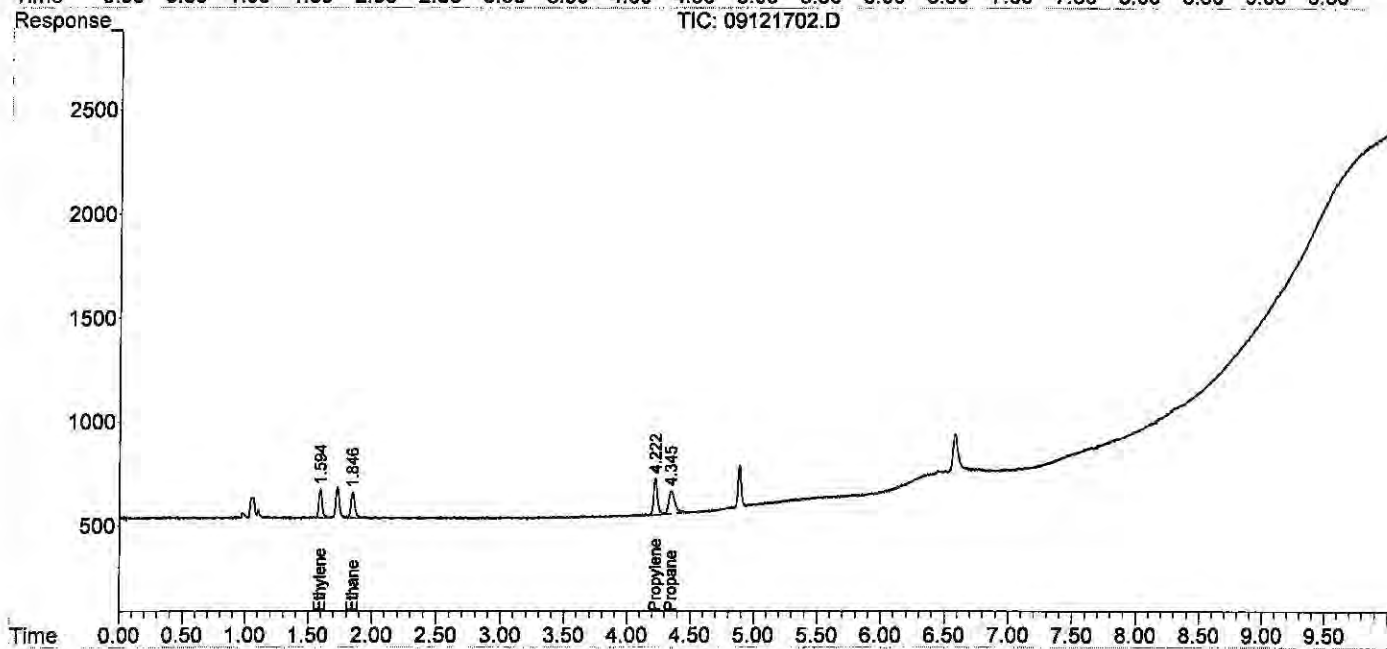
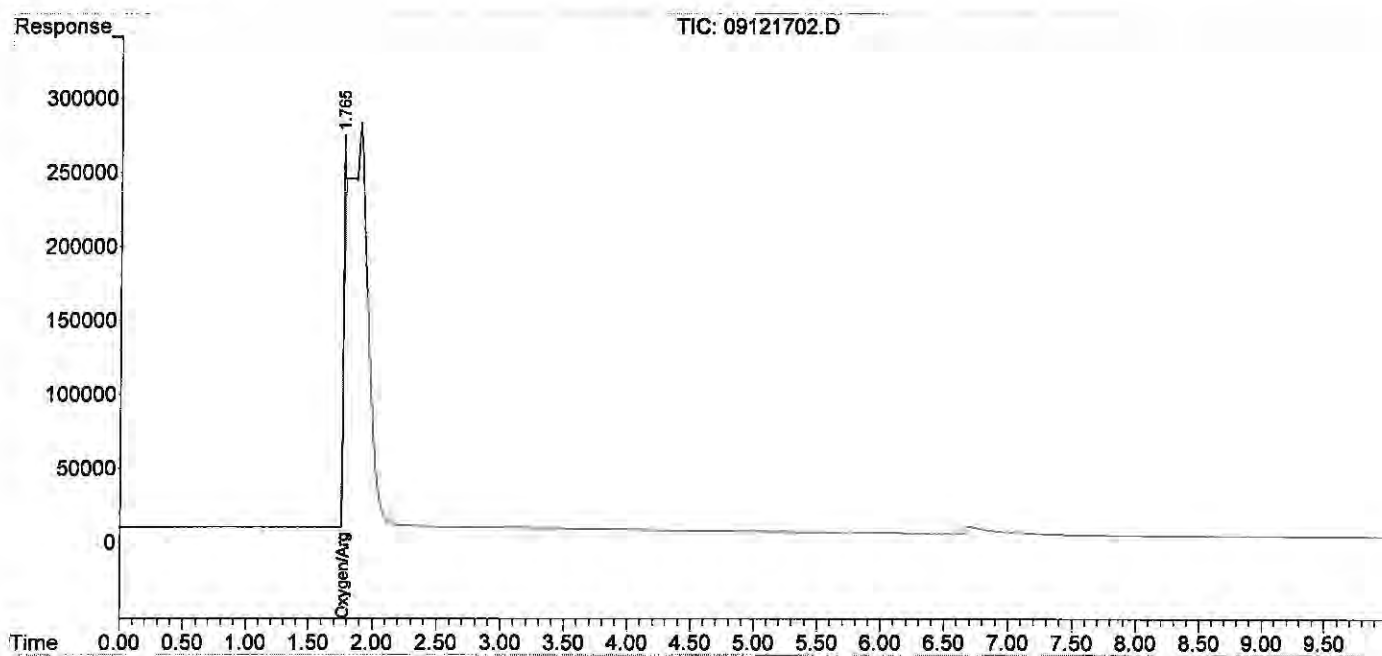
(m)=manual int.

MC 9/13/17

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
 Data File : 09121702.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 12-Sep-2017, 10:52
 Operator : MC
 Sample : 0.151ppm 0.250ml s32-09121702
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Sep 12 11:03:15 2017
 Quant Method : I:\GC10\METHODS\RS082417.M
 Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 QLast Update : Fri Aug 25 09:19:14 2017
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :



Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
 Data File : 09121703.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 12-Sep-2017, 11:05
 Operator : MC
 Sample : 0.302ppm 0.5ml s32-09121702
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Sep 13 11:05:03 2017
 Quant Method : J:\GC10\METHODS\RS091217_R.M
 Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 QLast Update : Wed Sep 13 11:04:50 2017
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :

Compound	R.T.	Response	Conc	Units

Target Compounds				
1) Oxygen/Argon	1.913f	-25181981	N.D.	ppm
2) Carbon monoxide	1.913f	-25181981	1.089	ppm
3) Methane (TCD)	0.000	0	N.D.	ppm
4) Carbon dioxide	0.000	0	N.D.	ppm
6) Methane (FID)	1.049	3564	0.391	ppm m
7) Ethylene	1.577	4947	0.292	ppm
8) Ethane	1.828	5060	0.293	ppm
9) Propylene	4.207	6933	0.281	ppm
10) Propane	4.337	6894	0.268	ppm
11) Isobutylene	0.000	0	N.D.	ppm
12) Isobutane	6.579f	9587	0.158	ppm
13) n-Butane	6.579f	9587	0.158	ppm

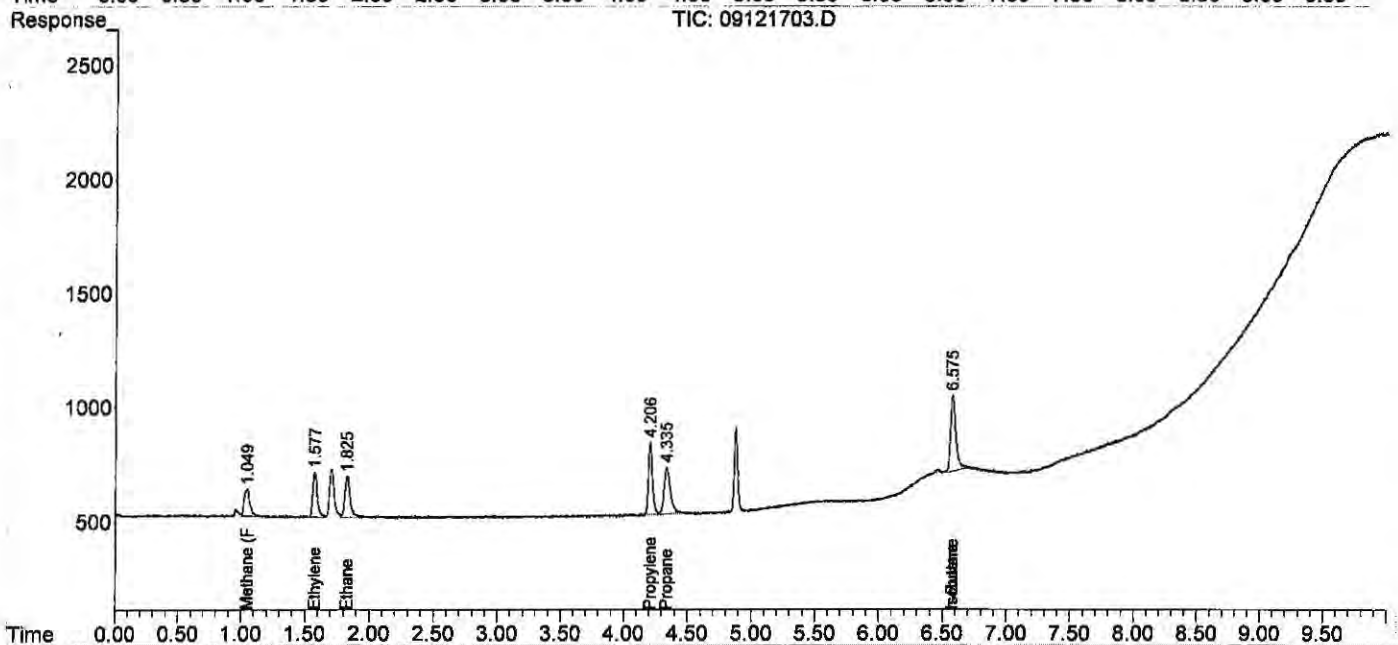
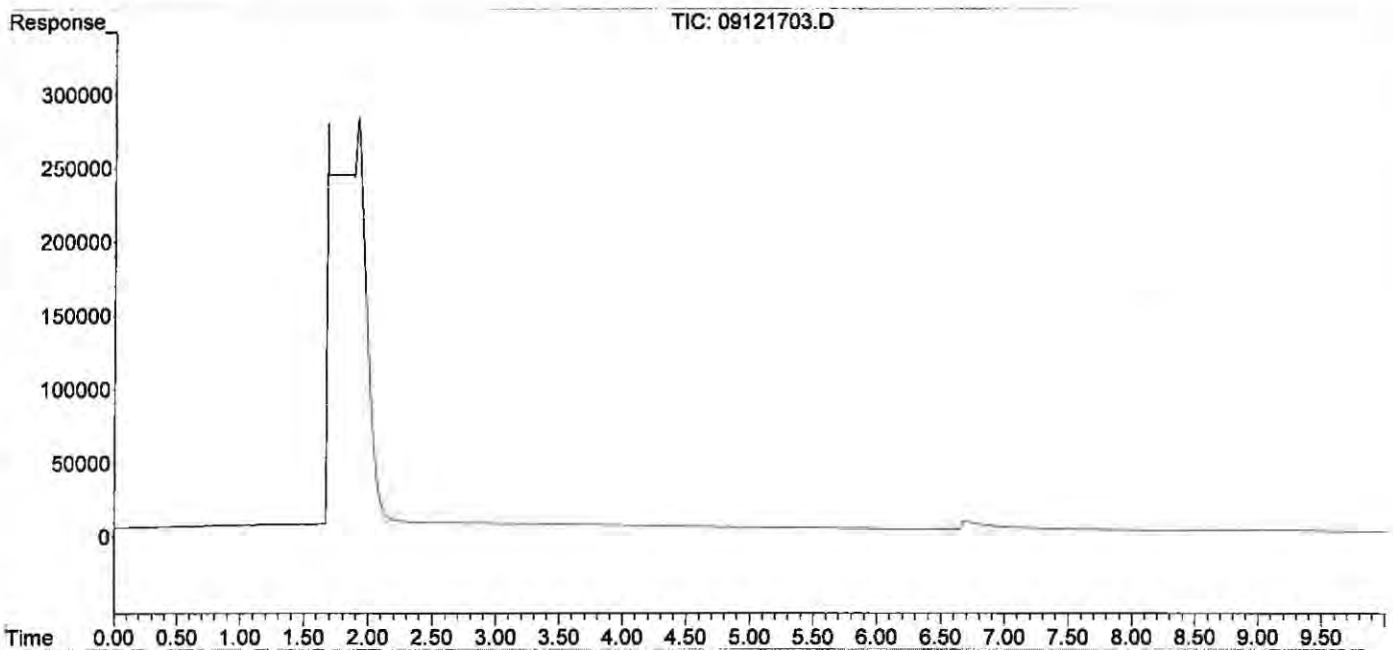
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
Data File : 09121703.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Sep-2017, 11:05
Operator : MC
Sample : 0.302ppm 0.5ml s32-09121702
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Sep 13 11:05:03 2017
Quant Method : J:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:04:50 2017
Response via : Initial Calibration
Integrator: ChemStation

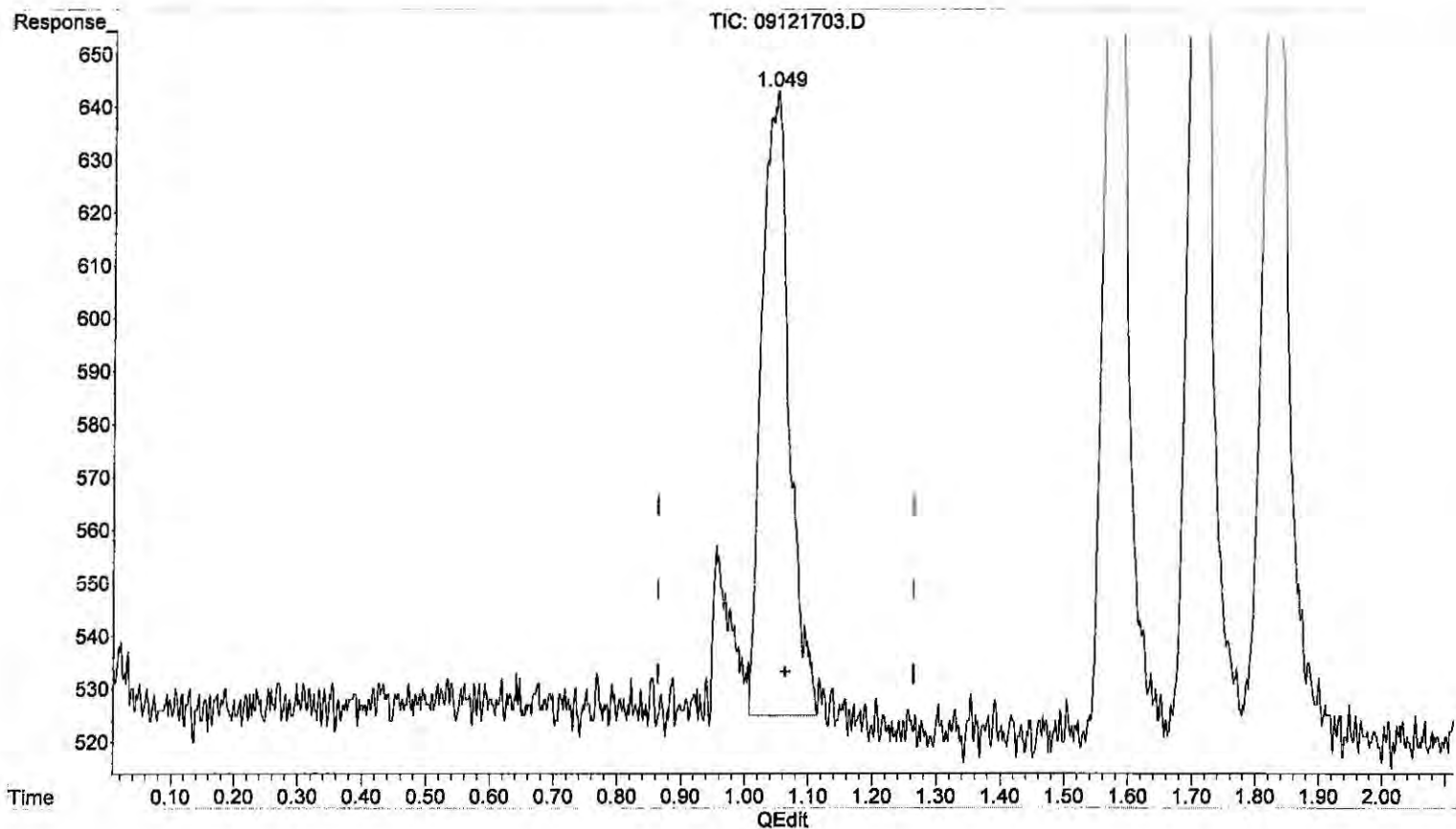
Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
 Data File : 09121703.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 12-Sep-2017, 11:05
 Operator : MC
 Sample : 0.302ppm 0.5ml s32-09121702
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Sep 13 11:05:03 2017
 Quant Method : J:\GC10\METHODS\RS091217_R.M
 Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 QLast Update : Wed Sep 13 11:04:50 2017
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :



(6) Methane (FID)
 1.049min 0.391 ppm m
 response 3564

Handwritten notes:
 Mc 9/13/17
 Bu
 No
 prater
 Wg/2/17

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
 Data File : 09121704.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 12-Sep-2017, 11:45
 Operator : MC
 Sample : 1.51ppm 0.1ml s32-09051701
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Sep 13 11:05:55 2017
 Quant Method : J:\GC10\METHODS\RS091217_R.M
 Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 QLast Update : Wed Sep 13 11:04:50 2017
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :

Compound	R.T.	Response	Conc	Units
Target Compounds				
1) Oxygen/Argon	1.847	2536230	1.056	ppm
2) Carbon monoxide	1.847	2536230	N.D.	ppm
3) Methane (TCD)	0.000	0	N.D.	ppm
4) Carbon dioxide	0.000	0	N.D.	ppm
6) Methane (FID)	1.064	14725	1.613	ppm
7) Ethylene	1.598	26885	1.582	ppm
8) Ethane	1.851	26944	1.555	ppm
9) Propylene	4.220	39140	1.589	ppm
10) Propane	4.349	39934	1.596	ppm
11) Isobutylene	0.000	0	N.D.	ppm
12) Isobutane	6.578f	55348	1.020	ppm
13) n-Butane	6.578f	55348	1.020	ppm

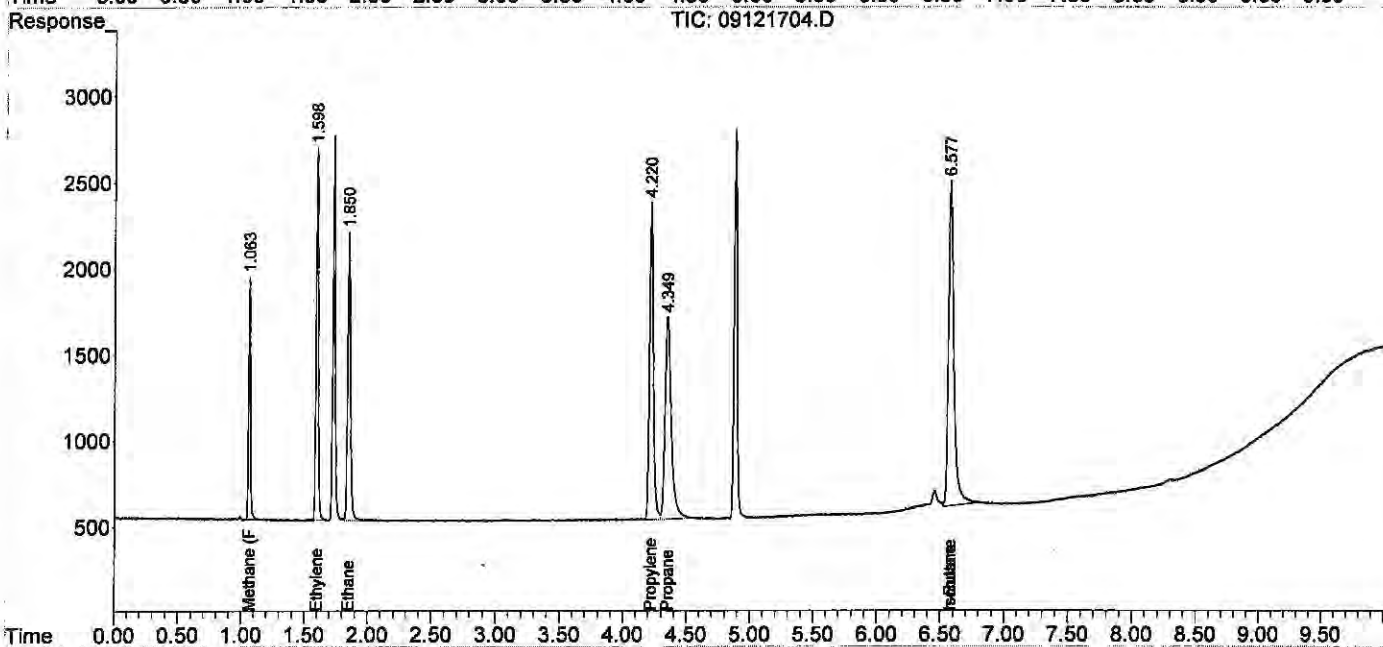
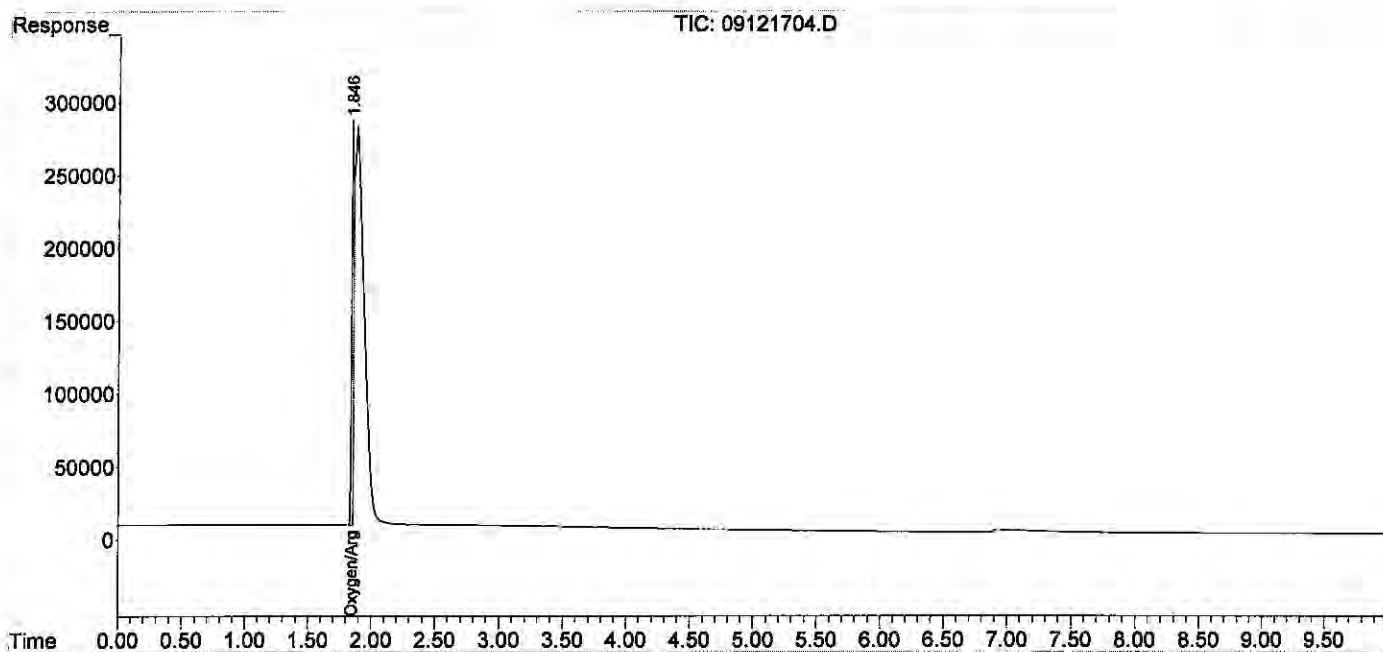
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
 Data File : 09121704.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 12-Sep-2017, 11:45
 Operator : MC
 Sample : 1.51ppm 0.1ml s32-09051701
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Sep 13 11:05:55 2017
 Quant Method : J:\GC10\METHODS\RS091217_R.M
 Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 QLast Update : Wed Sep 13 11:04:50 2017
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :



Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
 Data File : 09121705.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 12-Sep-2017, 12:09
 Operator : MC
 Sample : 4.53ppm 0.3ml s32-09051701
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Sep 13 11:06:32 2017
 Quant Method : J:\GC10\METHODS\RS091217_R.M
 Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 QLast Update : Wed Sep 13 11:04:50 2017
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :

Compound	R.T.	Response	Conc	Units

Target Compounds				
1) Oxygen/Argon	1.738	-331216	N.D.	ppm
2) Carbon monoxide	1.738	-331216	0.019	ppm
3) Methane (TCD)	0.000	0	N.D.	ppm
4) Carbon dioxide	0.000	0	N.D.	ppm
6) Methane (FID)	1.052	41129	4.522	ppm
7) Ethylene	1.586	77903	4.637	ppm
8) Ethane	1.838	78354	4.558	ppm
9) Propylene	4.218	112342	4.614	ppm
10) Propane	4.347	115723	4.680	ppm
11) Isobutylene	0.000	0	N.D.	ppm
12) Isobutane	6.580f	155256	3.565	ppm
13) n-Butane	6.580f	155256	3.565	ppm

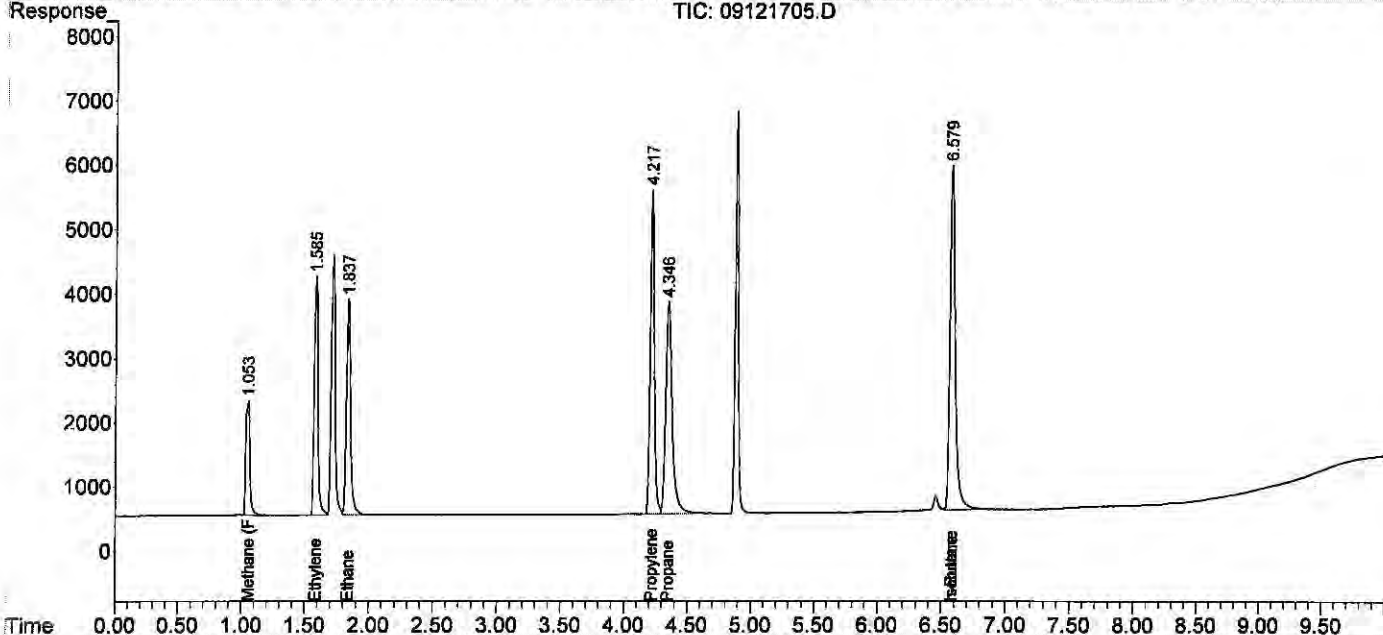
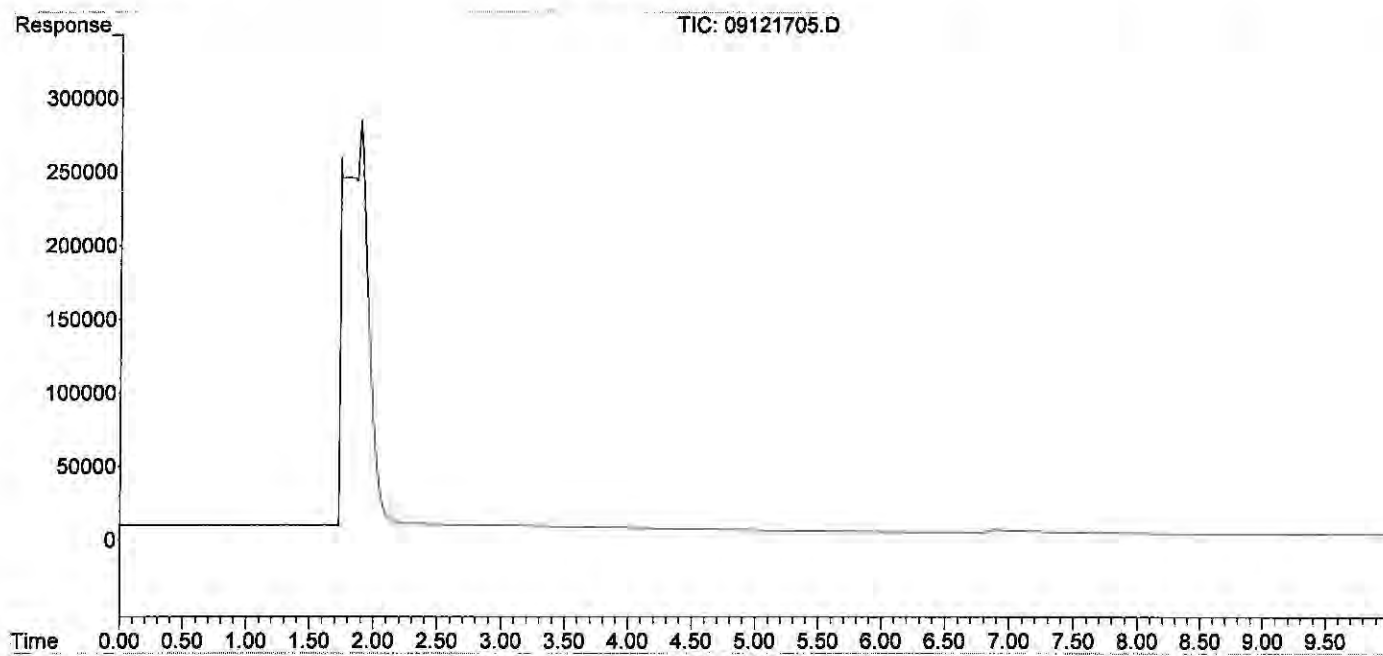
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
 Data File : 09121705.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 12-Sep-2017, 12:09
 Operator : MC
 Sample : 4.53ppm 0.3ml s32-09051701
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Sep 13 11:06:32 2017
 Quant Method : J:\GC10\METHODS\RS091217_R.M
 Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 QLast Update : Wed Sep 13 11:04:50 2017
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :



Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
 Data File : 09121706.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 12-Sep-2017, 12:30
 Operator : MC
 Sample : 10.57ppm 0.7ml s32-09051701
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Sep 13 11:09:24 2017
 Quant Method : J:\GC10\METHODS\RS091217_R.M
 Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 QLast Update : Wed Sep 13 11:04:50 2017
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :

Compound	R.T.	Response	Conc	Units

Target Compounds				
1) Oxygen/Argon	1.929f	-31871242	N.D.	ppm
2) Carbon monoxide	1.929f	-31871242	1.818	ppm
3) Methane (TCD)	0.000	0	N.D.	ppm
4) Carbon dioxide	0.000	0	N.D.	ppm
6) Methane (FID)	1.025	91967	10.135	ppm
7) Ethylene	1.568	172086	10.273	ppm
8) Ethane	1.822	178841	10.441	ppm
9) Propylene	4.214	248004	10.236	ppm
10) Propane	4.344	257124	10.458	ppm
11) Isobutylene	0.000	0	N.D.	ppm
12) Isobutane	6.578f	338181	9.254	ppm
13) n-Butane	6.578f	338181	9.254	ppm

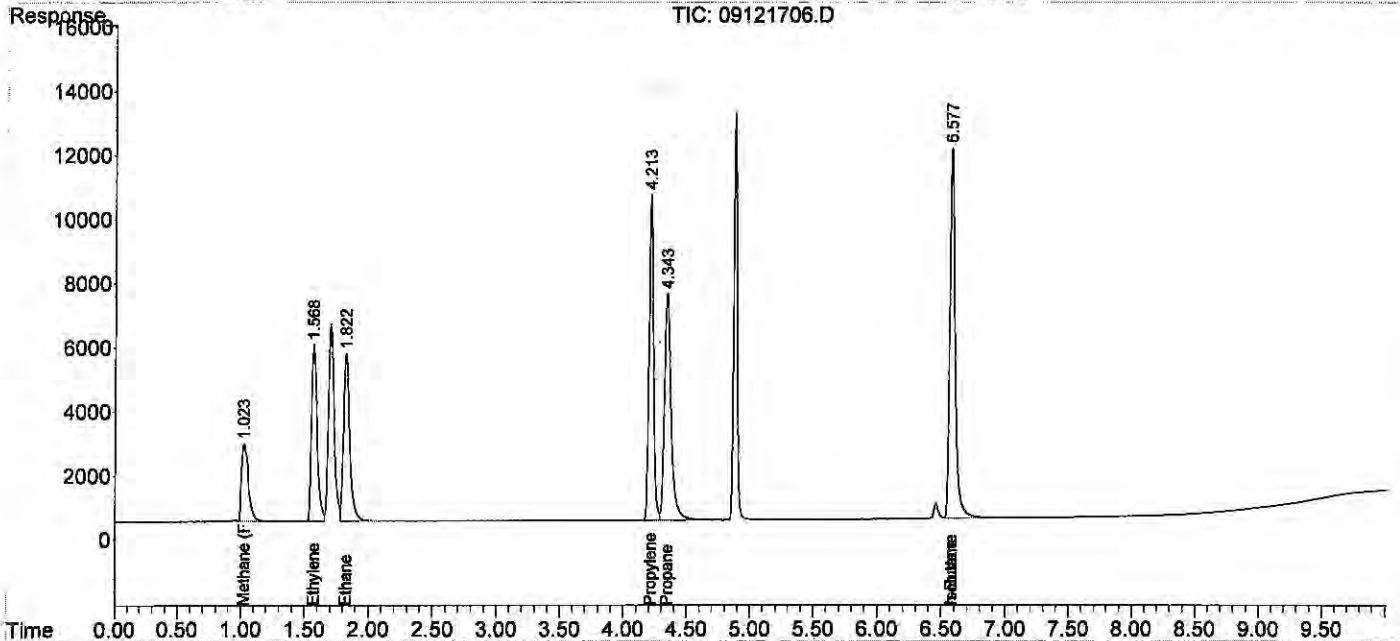
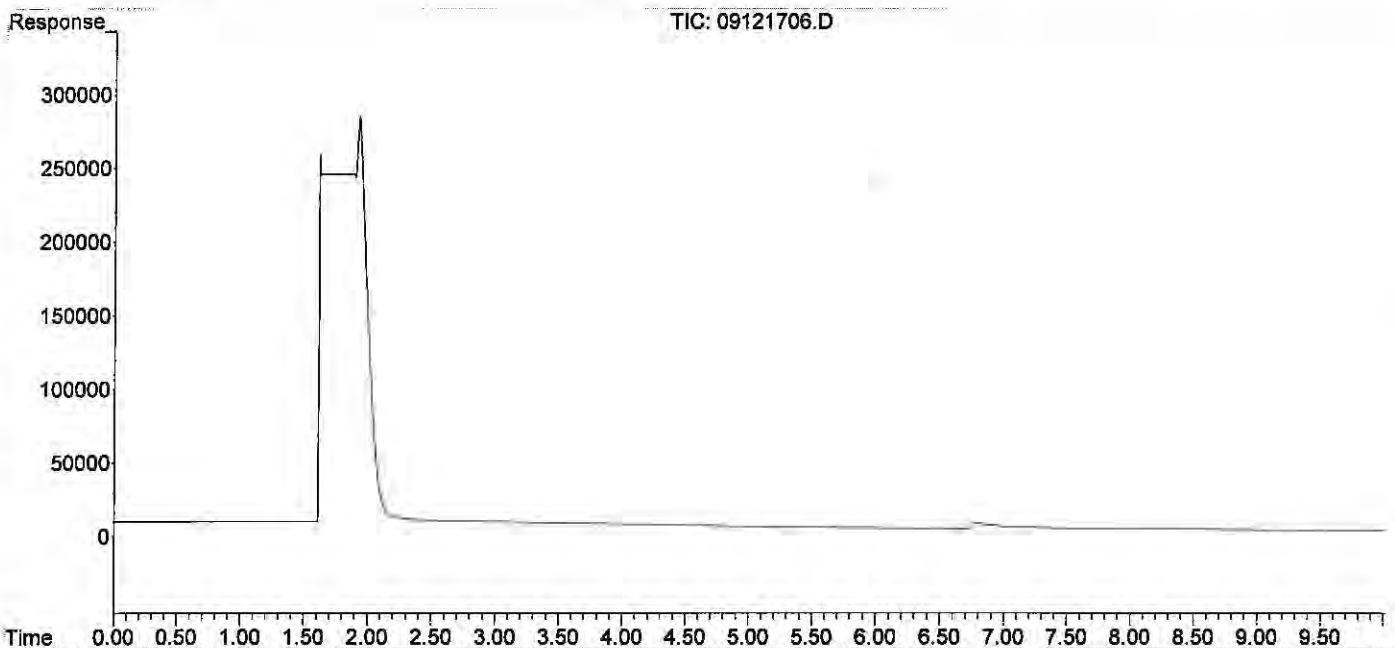
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
 Data File : 09121706.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 12-Sep-2017, 12:30
 Operator : MC
 Sample : 10.57ppm 0.7ml s32-09051701
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Sep 13 11:09:24 2017
 Quant Method : J:\GC10\METHODS\RS091217_R.M
 Quant Title : RSK175, VOA-DIGAS, VOA-TO3C1C6
 QLast Update : Wed Sep 13 11:04:50 2017
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :



Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
 Data File : 09121707.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 12-Sep-2017, 12:47
 Operator : MC
 Sample : 200ppm 0.1ml s32-09121701
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Sep 13 11:09:59 2017
 Quant Method : J:\GC10\METHODS\RS091217 R.M
 Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 QLast Update : Wed Sep 13 11:04:50 2017
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :

Compound	R.T.	Response	Conc	Units

Target Compounds				
1) Oxygen/Argon	1.897	155286	0.065	ppm
2) Carbon monoxide	1.897	155286	N.D.	ppm
3) Methane (TCD)	4.079f	27015	2856.472	ppm
4) Carbon dioxide	0.000	0	N.D.	ppm
6) Methane (FID)	1.063	1735997	190.792	ppm
7) Ethylene	1.597	3339702	198.758	ppm
8) Ethane	1.849	3350442	194.597	ppm
9) Propylene	4.201	4504060	185.706	ppm
10) Propane	4.333	5043036	204.809	ppm
11) Isobutylene	0.000	0	N.D.	ppm
12) Isobutane	0.000	0	N.D.	ppm
13) n-Butane	0.000	0	N.D.	ppm

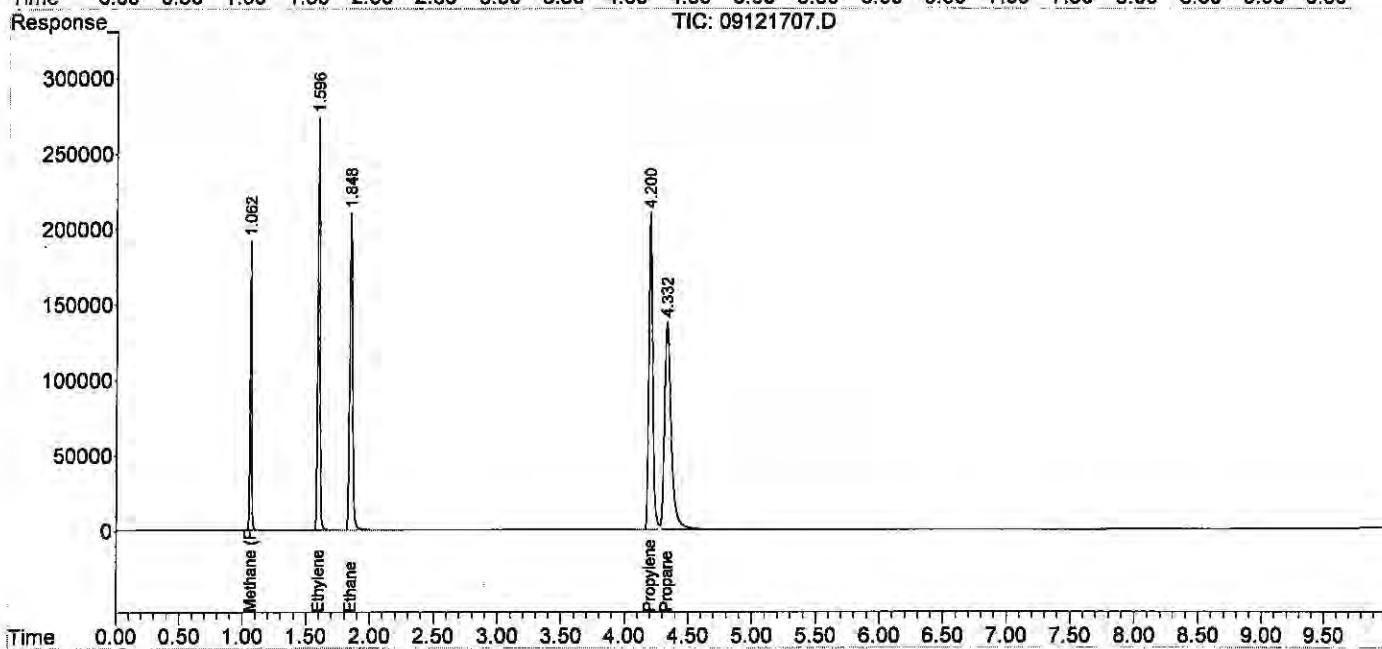
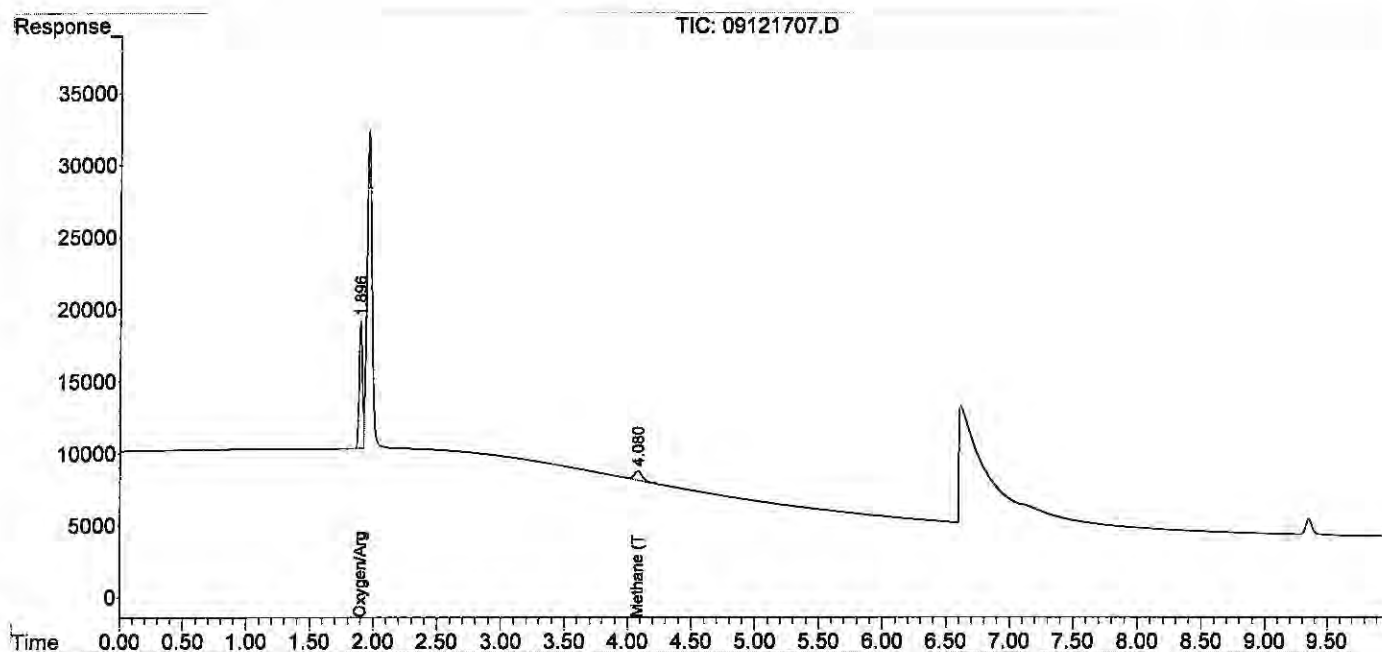
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
 Data File : 09121707.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 12-Sep-2017, 12:47
 Operator : MC
 Sample : 200ppm 0.1ml s32-09121701
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Sep 13 11:09:59 2017
 Quant Method : J:\GC10\METHODS\RS091217_R.M
 Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 QLast Update : Wed Sep 13 11:04:50 2017
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :



Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
 Data File : 09121708.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 12-Sep-2017, 13:00
 Operator : MC
 Sample : 600ppm 0.3ml s32-09121701
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Sep 13 11:10:57 2017
 Quant Method : J:\GC10\METHODS\RS091217_R.M
 Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 QLast Update : Wed Sep 13 11:10:50 2017
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :

Compound	R.T.	Response	Conc	Units

Target Compounds				
1) Oxygen/Argon	1.884	196022	0.124	ppm
2) Carbon monoxide	1.884	196022	N.D.	ppm
3) Methane (TCD)	4.070f	88282	782.730	ppm
4) Carbon dioxide	0.000	0	N.D.	ppm
6) Methane (FID)	1.044	5189849	539.759	ppm
7) Ethylene	1.573	10007759	590.286	ppm
8) Ethane	1.822	10048964	583.213	ppm
9) Propylene	4.160	13569343	562.612	ppm
10) Propane	4.300	15251326	615.171	ppm
11) Isobutylene	6.143	9815	NoCal	ppm
12) Isobutane	0.000	0	N.D.	ppm
13) n-Butane	0.000	0	N.D.	ppm

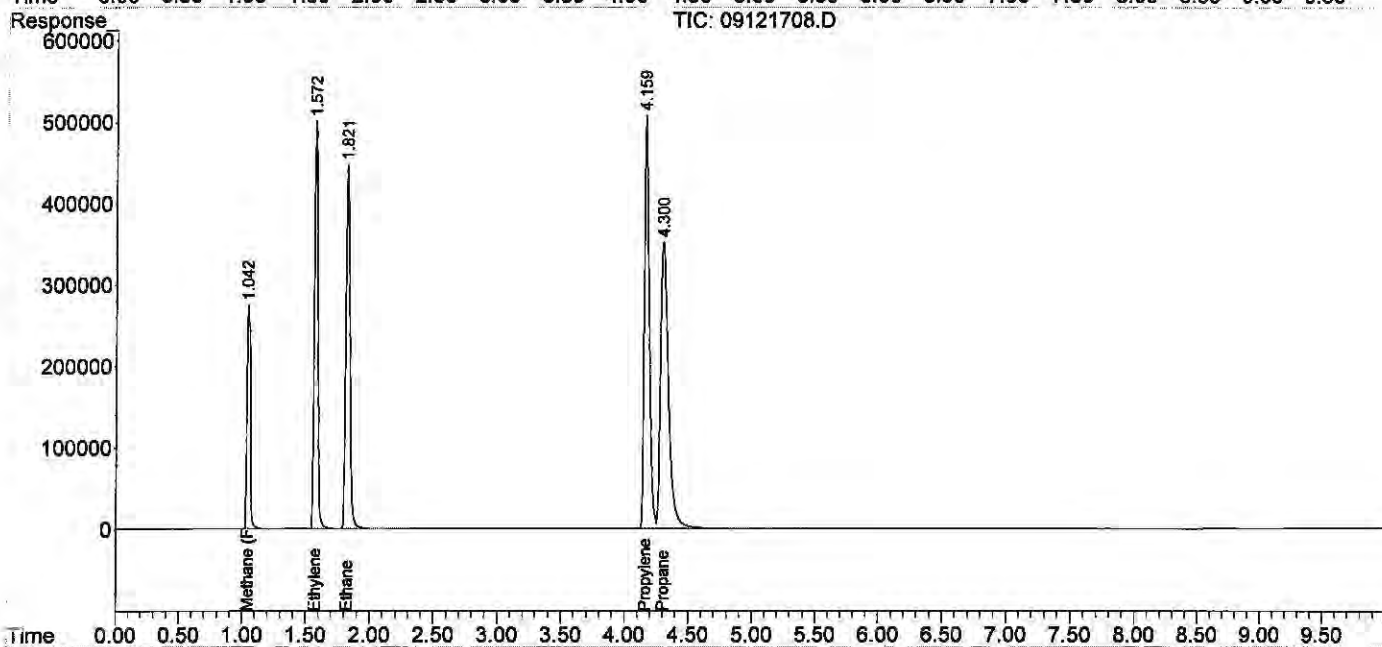
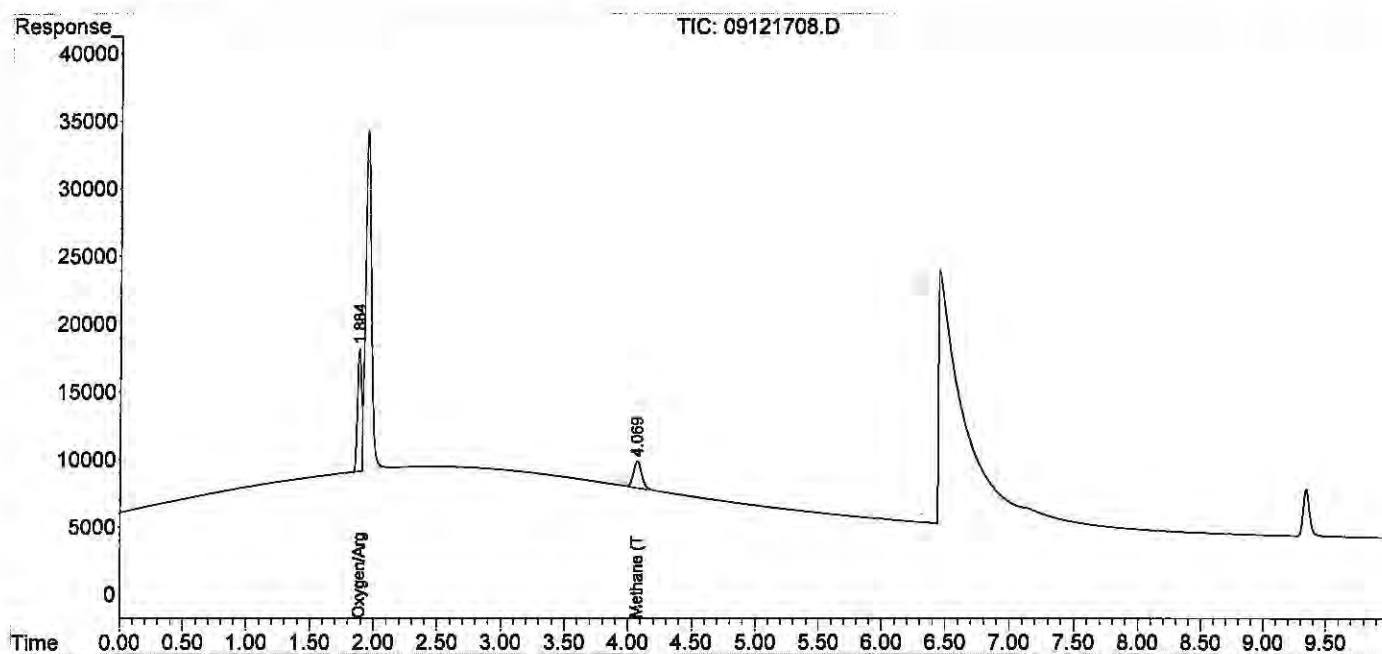
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
 Data File : 09121708.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 12-Sep-2017, 13:00
 Operator : MC
 Sample : 600ppm 0.3ml s32-09121701
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Sep 13 11:10:57 2017
 Quant Method : J:\GC10\METHODS\RS091217_R.M
 Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 QLast Update : Wed Sep 13 11:10:50 2017
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :



Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
 Data File : 09121709.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 12-Sep-2017, 13:47
 Operator : MC
 Sample : 1000ppm 0.5ml s32-09121701
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Sep 13 11:11:46 2017
 Quant Method : J:\GC10\METHODS\RS091217_R.M
 Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 QLast Update : Wed Sep 13 11:11:38 2017
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :

Compound	R.T.	Response	Conc	Units

Target Compounds				
1) Oxygen/Argon	1.879	192611	0.162	ppm
2) Carbon monoxide	1.879	192611	N.D.	ppm
3) Methane (TCD)	4.070f	145492	1244.729	ppm
4) Carbon dioxide	0.000	0	N.D.	ppm
6) Methane (FID)	1.039	8598534	945.644	ppm
7) Ethylene	1.576	16608504	981.887	ppm
8) Ethane	1.827	16709165	973.644	ppm
9) Propylene	4.161	22494888	941.060	ppm
10) Propane	4.298	25459411	1023.223	ppm
11) Isobutylene	6.138	16970	8645.243	ppm
12) Isobutane	0.000	0	N.D.	ppm
13) n-Butane	0.000	0	N.D.	ppm

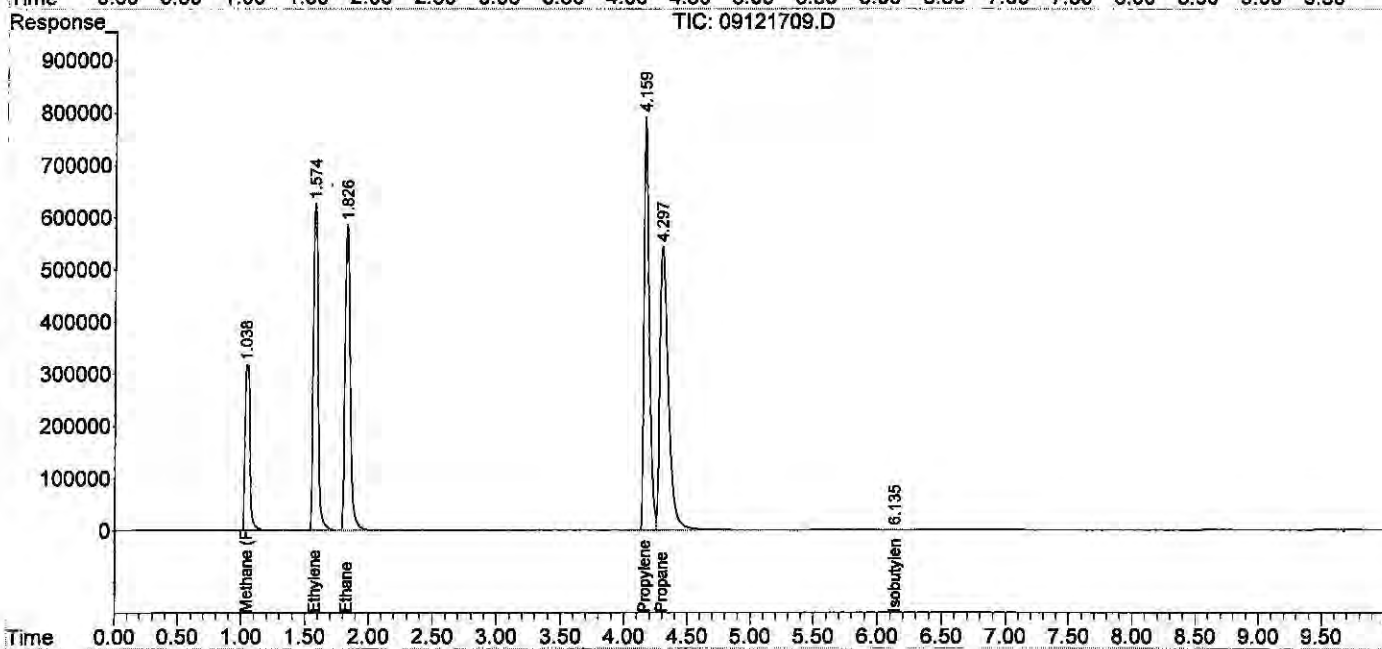
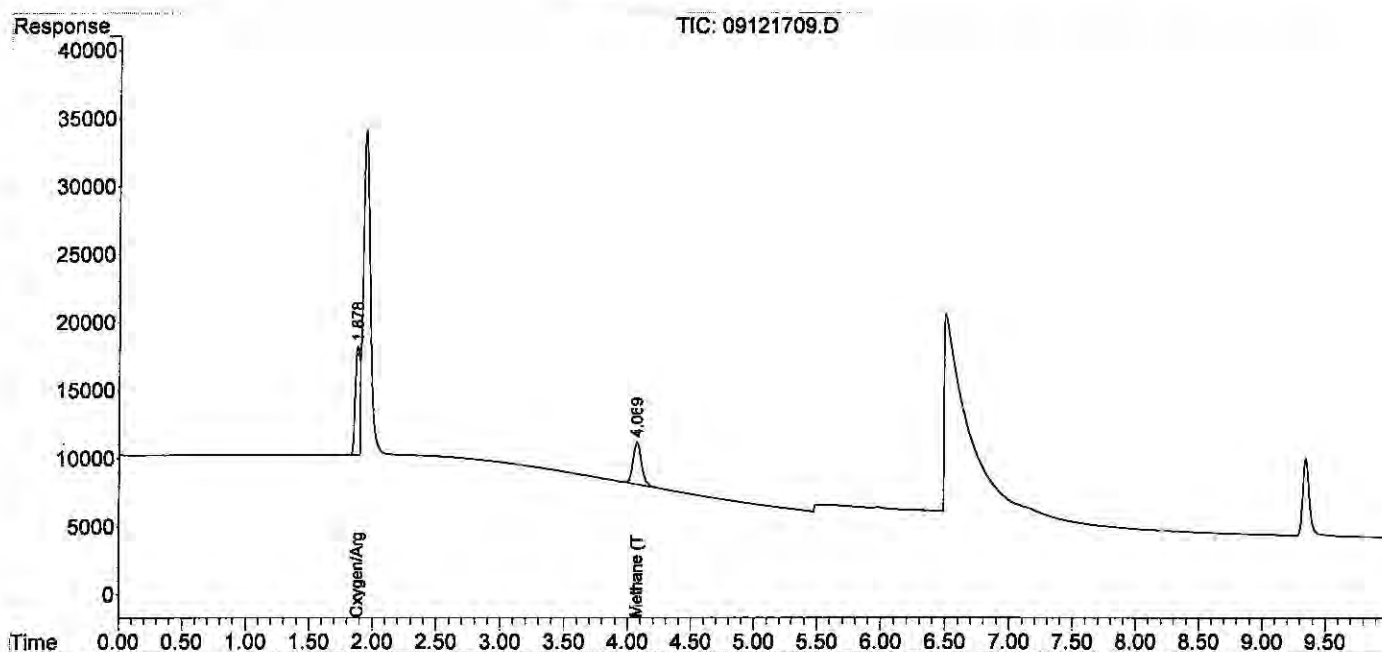
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
 Data File : 09121709.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 12-Sep-2017, 13:47
 Operator : MC
 Sample : 1000ppm 0.5ml s32-09121701
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Sep 13 11:11:46 2017
 Quant Method : J:\GC10\METHODS\RS091217_R.M
 Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 QLast Update : Wed Sep 13 11:11:38 2017
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :



Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
 Data File : 09121710.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 12-Sep-2017, 14:07
 Operator : MC
 Sample : 2000ppm 1ml s32-09121701
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Sep 13 11:12:33 2017
 Quant Method : J:\GC10\METHODS\RS091217_R.M
 Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 QLast Update : Wed Sep 13 11:12:25 2017
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :

Compound	R.T.	Response	Conc	Units
Target Compounds				
1) Oxygen/Argon	1.922f	1578147	1.659	ppm
2) Carbon monoxide	1.922f	1578147	N.D.	ppm
3) Methane (TCD)	4.057f	281651	3526.607	ppm
4) Carbon dioxide	0.000	0	N.D.	ppm
6) Methane (FID)	1.016	16098209	1763.622	ppm
7) Ethylene	1.552	31192444	1848.268	ppm
8) Ethane	1.801	31424218	1837.143	ppm
9) Propylene	4.129	42124690	1775.341	ppm m
10) Propane	4.269	48583085	1946.921	ppm
11) Isobutylene	6.136	33832	25613.603	ppm
12) Isobutane	6.576f	3845	0.120	ppm
13) n-Butane	6.576f	3845	0.120	ppm

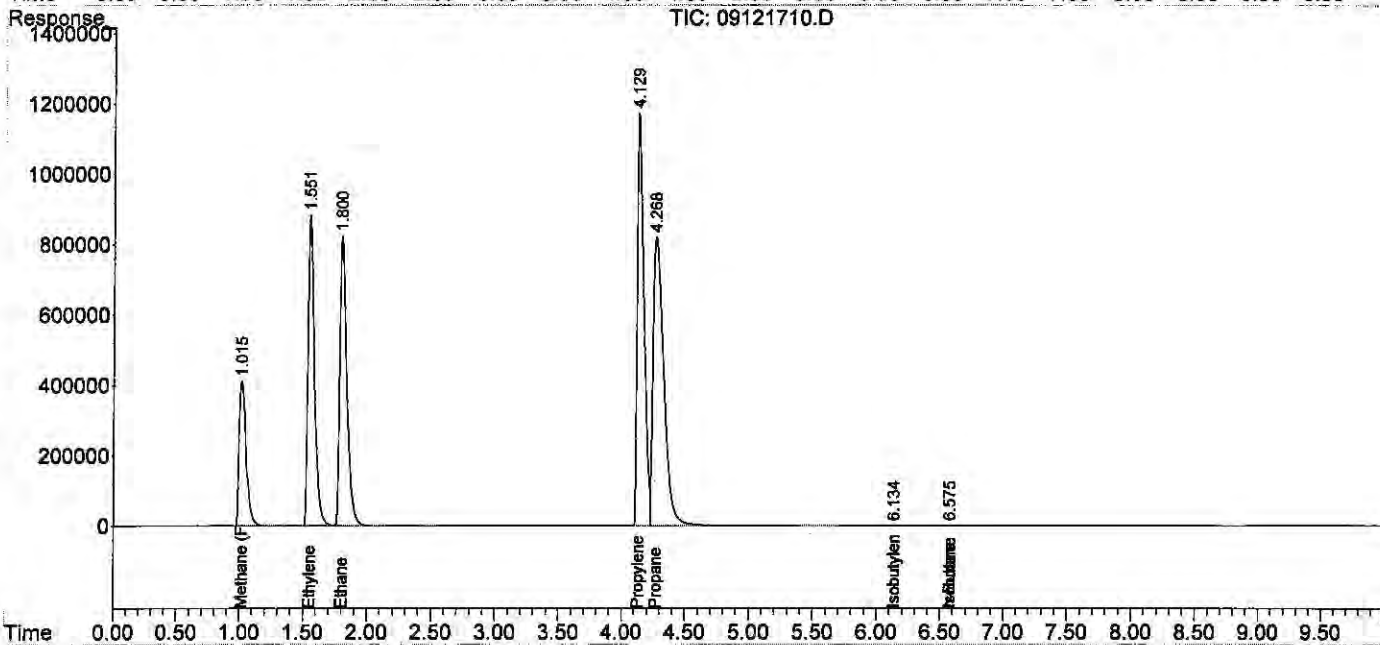
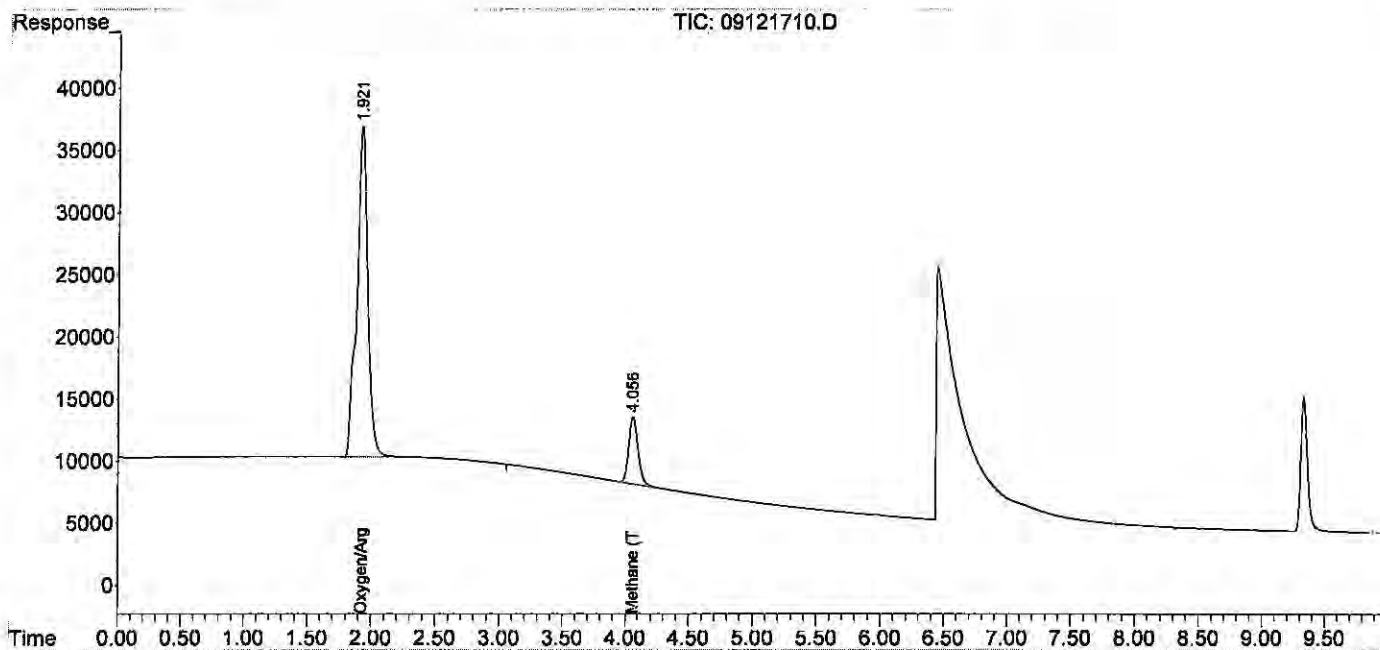
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
 Data File : 09121710.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 12-Sep-2017, 14:07
 Operator : MC
 Sample : 2000ppm 1ml s32-09121701
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Sep 13 11:12:33 2017
 Quant Method : J:\GC10\METHODS\RS091217 R.M
 Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 QLast Update : Wed Sep 13 11:12:25 2017
 Response via : Initial Calibration
 Integrator: ChemStation

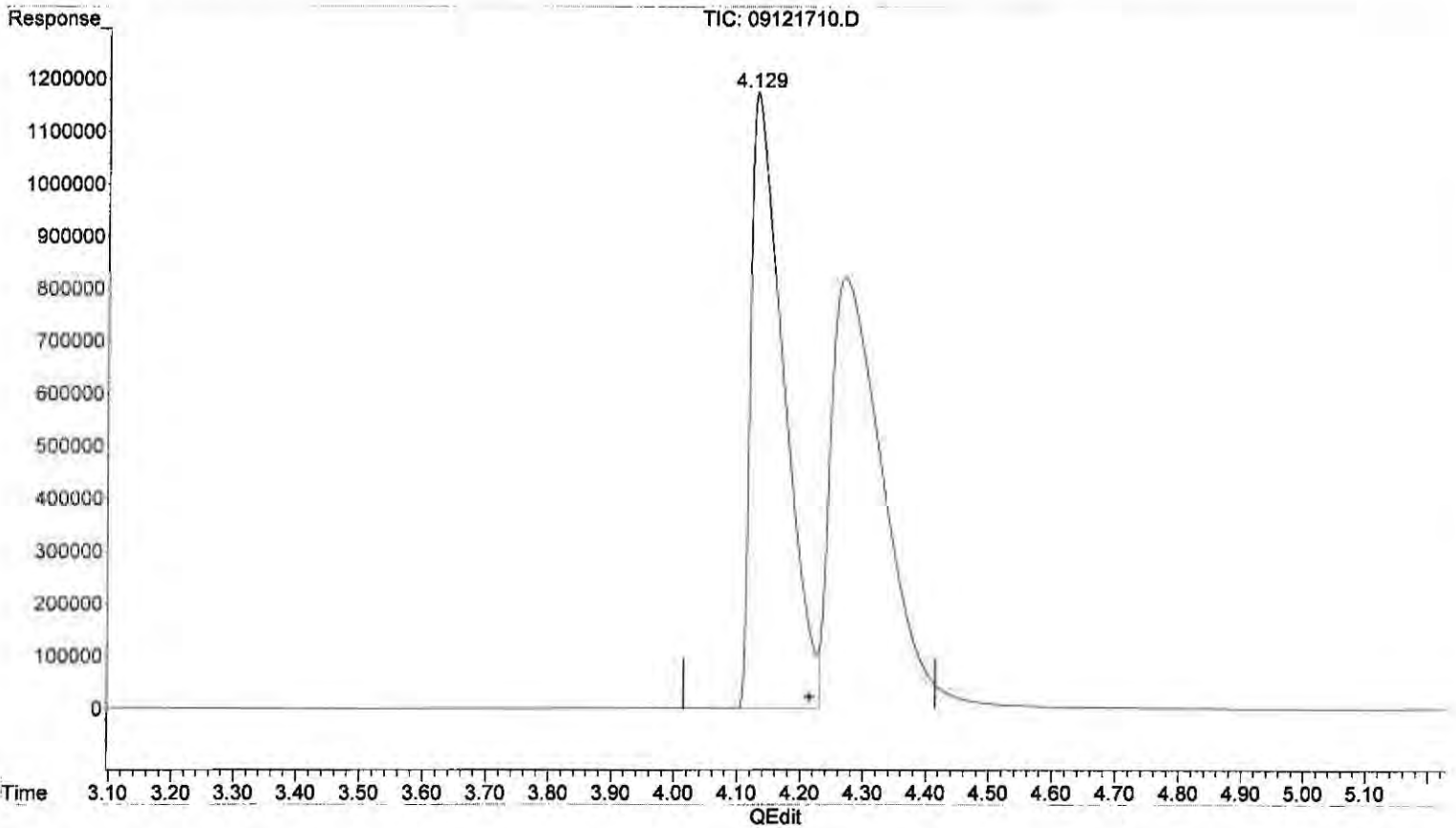
Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :



Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
 Data File : 09121710.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 12-Sep-2017, 14:07
 Operator : MC
 Sample : 2000ppm 1ml s32-09121701
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Sep 13 11:12:33 2017
 Quant Method : J:\GC10\METHODS\RS091217_R.M
 Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 QLast Update : Wed Sep 13 11:12:25 2017
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :



(9) Propylene
 4.129min 1775.341 ppm m
 response 42124690

*Mz 41/43
 WP
 No Pres
 9/21/17*

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
 Data File : 09121711.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 12-Sep-2017, 14:48
 Operator : MC
 Sample : 4000ppm 0.1ml s32-08231701
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Sep 13 11:13:37 2017
 Quant Method : J:\GC10\METHODS\RS091217_R.M
 Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 QLast Update : Wed Sep 13 11:13:29 2017
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :

Compound	R.T.	Response	Conc	Units
Target Compounds				
1) Oxygen/Argon	0.000	0	N.D.	ppm d
2) Carbon monoxide	0.000	0	N.D.	ppm d
3) Methane (TCD)	0.000	0	N.D.	ppm d
4) Carbon dioxide	0.000	0	N.D.	ppm d
6) Methane (FID)	1.059	35776839	3925.122	ppm
7) Ethylene	0.000	0	N.D.	ppm
8) Ethane	0.000	0	N.D.	ppm
9) Propylene	0.000	0	N.D.	ppm
10) Propane	0.000	0	N.D.	ppm
11) Isobutylene	0.000	0	N.D.	ppm
12) Isobutane	0.000	0	N.D.	ppm
13) n-Butane	0.000	0	N.D.	ppm

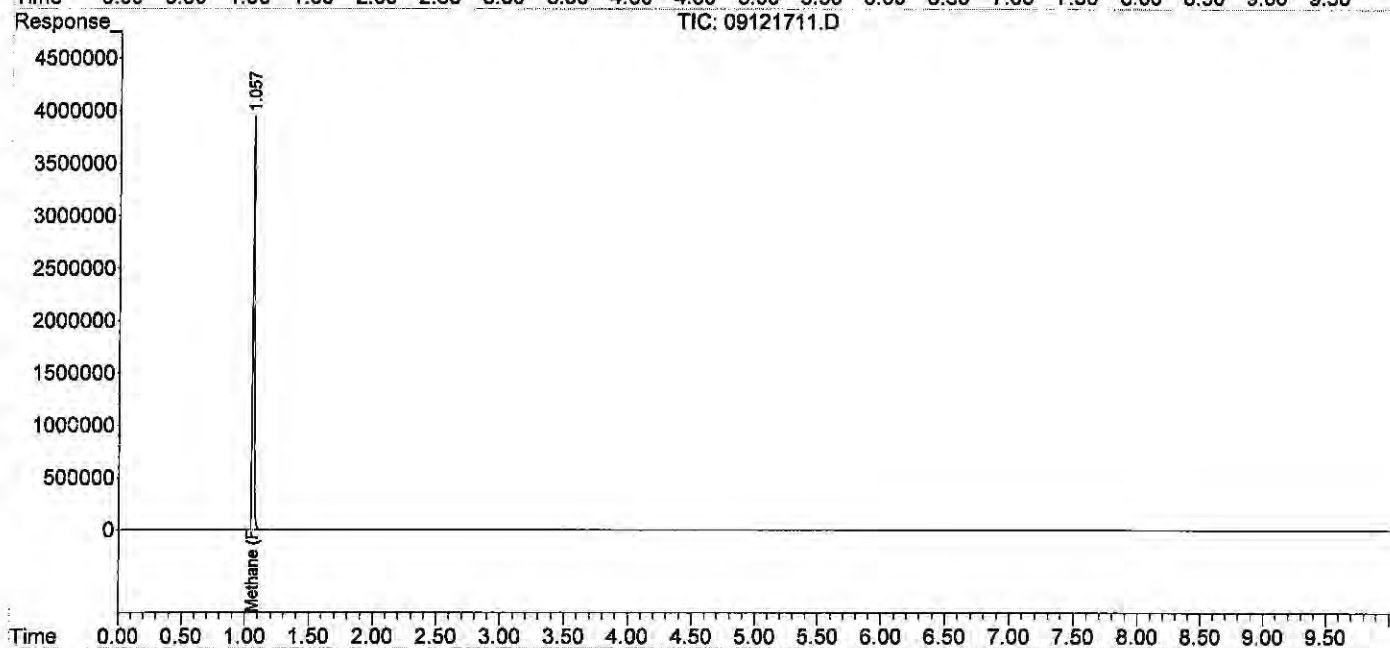
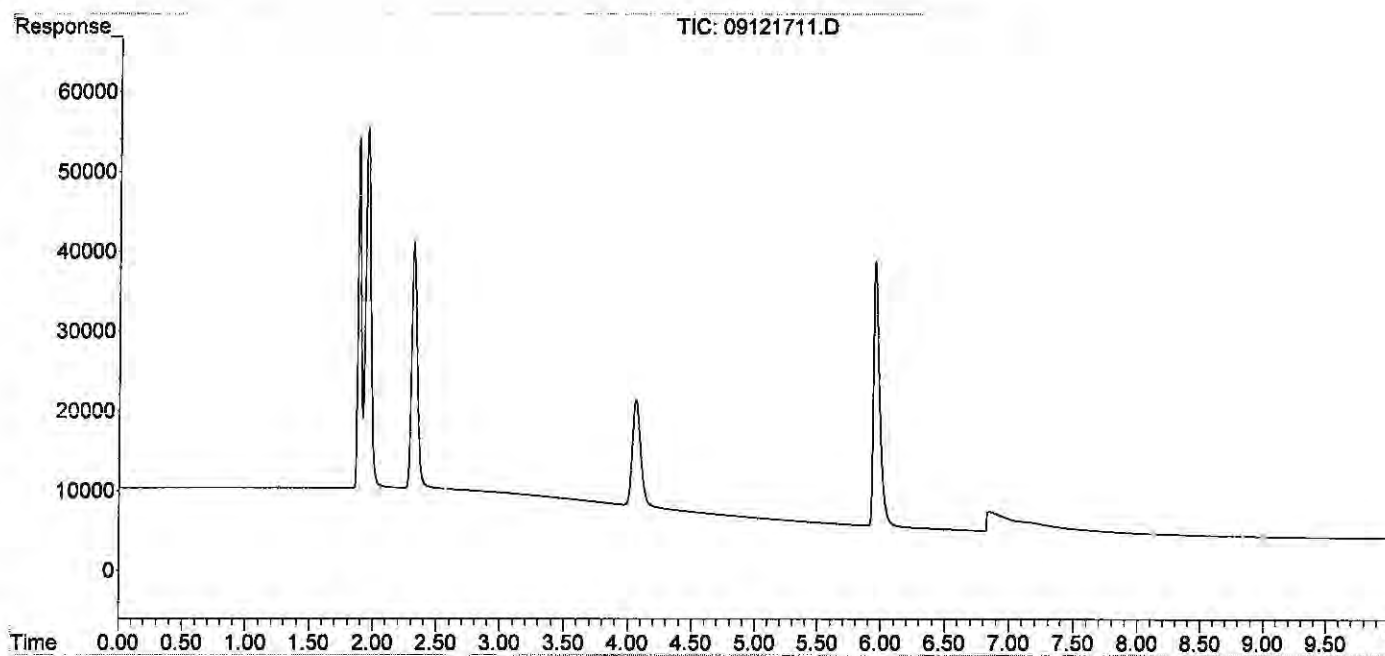
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
 Data File : 09121711.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 12-Sep-2017, 14:48
 Operator : MC
 Sample : 4000ppm 0.1ml s32-08231701
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Sep 13 11:13:37 2017
 Quant Method : J:\GC10\METHODS\RS091217_R.M
 Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 QLast Update : Wed Sep 13 11:13:29 2017
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :



Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
 Data File : 09121712.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 12-Sep-2017, 15:21
 Operator : MC
 Sample : 20000ppm 0.5ml s32-08231701
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Sep 13 11:14:17 2017
 Quant Method : J:\GC10\METHODS\RS091217_R.M
 Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 QLast Update : Wed Sep 13 11:13:29 2017
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :

Compound	R.T.	Response	Conc	Units

Target Compounds				
1) Oxygen/Argon	0.000	0	N.D.	ppm d
2) Carbon monoxide	1.836	3190788	N.D.	ppm
3) Methane (TCD)	0.000	0	N.D.	ppm d
4) Carbon dioxide	0.000	0	N.D.	ppm d
6) Methane (FID)	1.034	169009160	18492.064	ppm
7) Ethylene	0.000	0	N.D.	ppm
8) Ethane	0.000	0	N.D.	ppm
9) Propylene	0.000	0	N.D.	ppm
10) Propane	0.000	0	N.D.	ppm
11) Isobutylene	0.000	0	N.D.	ppm
12) Isobutane	0.000	0	N.D.	ppm
13) n-Butane	0.000	0	N.D.	ppm

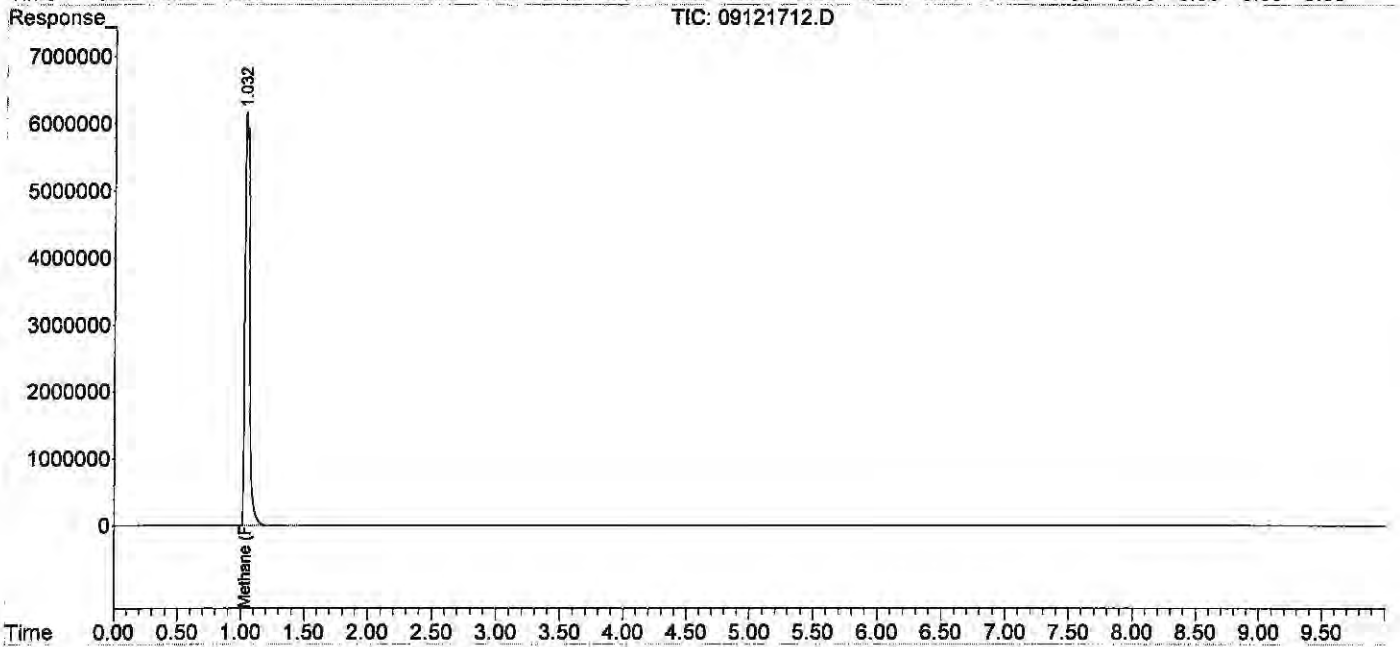
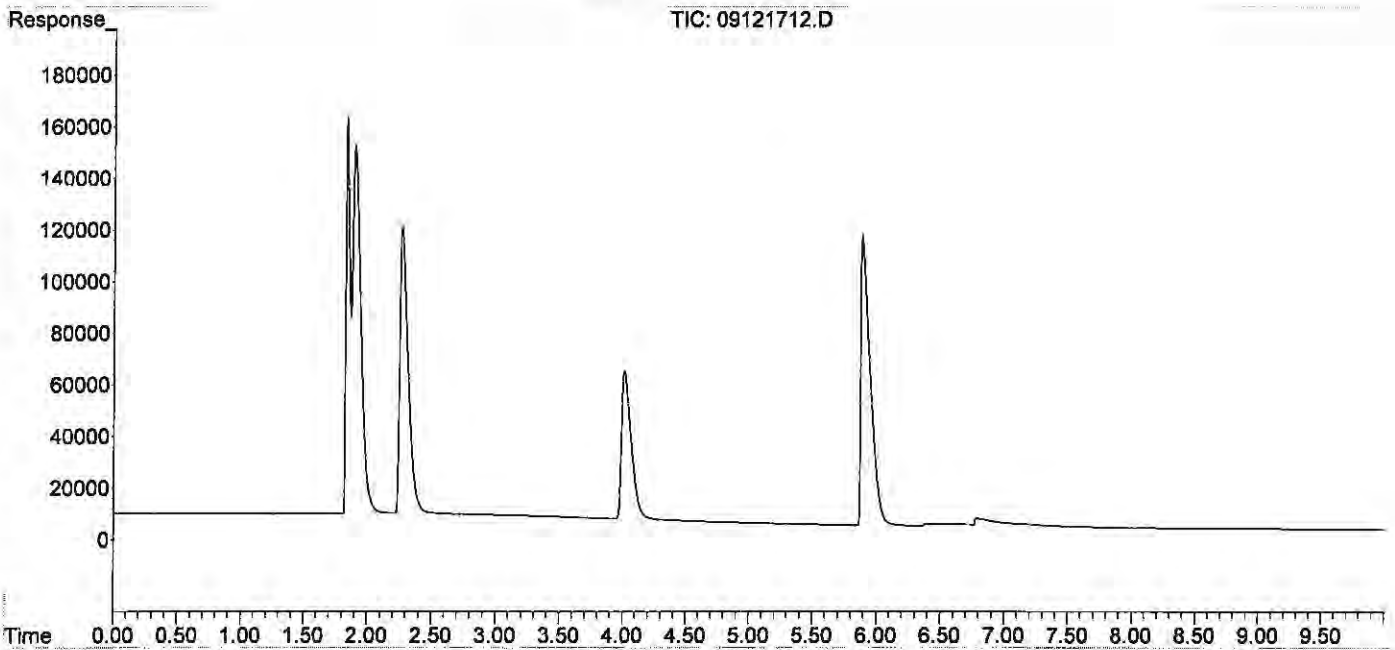
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
 Data File : 09121712.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 12-Sep-2017, 15:21
 Operator : MC
 Sample : 20000ppm 0.5ml s32-08231701
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Sep 13 11:14:17 2017
 Quant Method : J:\GC10\METHODS\RS091217_R.M
 Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 QLast Update : Wed Sep 13 11:13:29 2017
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :



Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
 Data File : 09121715.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 12-Sep-2017, 16:15
 Operator : MC
 Sample : icv s30-05241604
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Sep 13 11:15:11 2017
 Quant Method : J:\GC10\METHODS\RS091217_R.M
 Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 QLast Update : Wed Sep 13 11:13:29 2017
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :

Compound	R.T.	Response	Conc	Units
Target Compounds				
1) Oxygen/Argon	1.843	2922459	3.687	ppm
2) Carbon monoxide	1.843	2922459	N.D.	ppm
3) Methane (TCD)	0.000	0	N.D.	ppm <i>actual 2/1</i>
4) Carbon dioxide	0.000	0	N.D.	ppm
6) Methane (FID)	1.063	13748	1.516	ppm <i>1.50 101.1</i>
7) Ethylene	1.598	24153	1.443	ppm <i>1.50 96.2</i>
8) Ethane	1.850	24488	1.445	ppm <i>1.50 96.3</i>
9) Propylene	4.221	36004	1.537	ppm <i>1.50 102.5</i>
10) Propane	4.350	37738	1.517	ppm <i>1.51 100.5</i>
11) Isobutylene	0.000	0	N.D.	ppm
12) Isobutane	6.579f	48019	1.804	ppm <i>9/14/2</i>
13) n-Butane	6.579f	48019	1.804	ppm

(f)=RT Delta > 1/2 Window

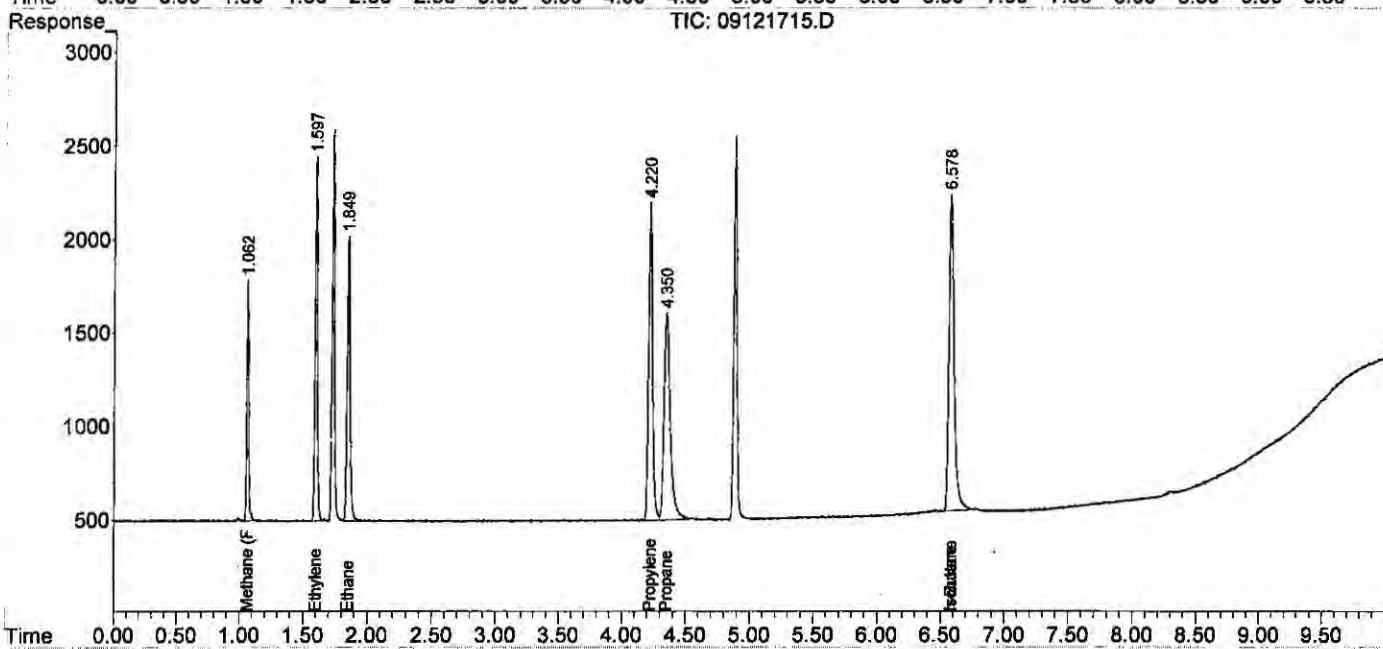
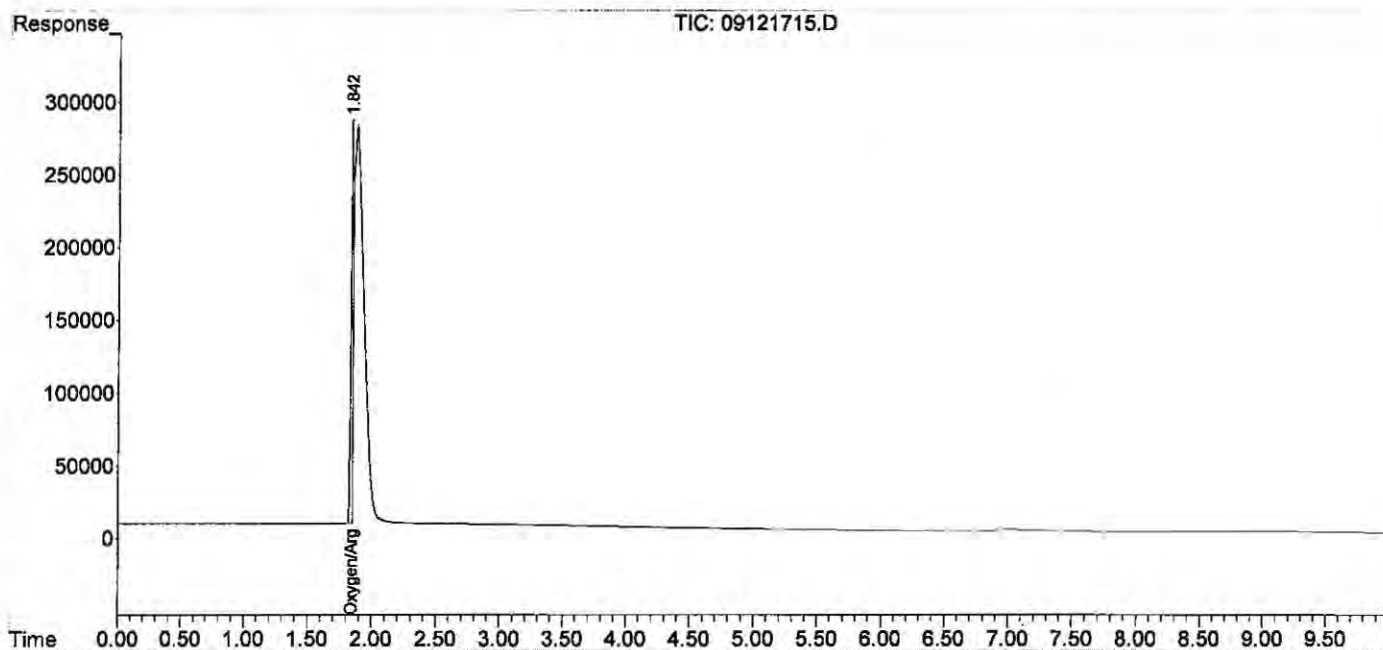
(m)=manual int.

W. J. Z. A.

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
 Data File : 09121715.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 12-Sep-2017, 16:15
 Operator : MC
 Sample : icv s30-05241604
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Sep 13 11:15:11 2017
 Quant Method : J:\GC10\METHODS\RS091217_R.M
 Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 QLast Update : Wed Sep 13 11:13:29 2017
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :



ALS Environmental

Method : RSK175 Headspace Method for Dissolved Hydrocarbon in Water by FID/TCD

Client : ALS Laboratory Group

Analyst : WH

Instrument : GC#10
 Detector : FID#10, TCD#10

Service Request: P1904674

Date Analysis : 08/12/19

Gas Constant : 24.05684 (20°C)

Sample Vol. (ml) : 32.00 ml
 Head Space Vol. (ml) : 8.00 ml

HEAD_SPACE_RESULT (ppm)

FINAL_HEAD_SPACE_RESULT (ppm)

Sample ID	Ini. Vol.	Methane	Ethylene	Ethane	Methane	Ethylene	Ethane
STD s32-05221901	0.100	89.959	95.892	95.487	16.04	28.05	30.07
ACTUAL		101.50	100.90	101.40	3.76E+04	1.02E+04	2.63E+04
%Difference		11.4%	5.0%	5.8%	1.30	1.00	0.60
MCS 0.1ml	0.100	0.068	0.000	0.000	MCS 0.1ml	0.000	0.000
rb 0.1ml	0.100	0.000	0.000	0.000			
LCS FID	0.100	1.406	0.994	1.214	LCS FID	9.940	12.140
LCSD FID	0.100	1.332	0.996	1.256	LCSD FID	9.960	12.560
P1904674-001 0.1ml	0.100	0.000	0.000	0.000	P1904674-001 0.1ml	0.000	0.000
P1904674-002 0.1ml	0.100	0.088	0.000	0.000	P1904674-002 0.1ml	0.880	0.000
P1904674-003 0.1ml	0.100	0.082	0.000	0.000	P1904674-003 0.1ml	0.820	0.000
P1904674-004 0.1ml	0.100	0.000	0.000	0.000	P1904674-004 0.1ml	0.000	0.000

WWL
HENRY'S CONSTANT
RL

STD s32-05221901	89.857	96.154	95.862
ACTUAL	101.50	100.90	101.40
%Difference	11.5%	4.7%	5.5%

Data Path : J:\GC10\DATA\RSK_FID\2019_08\12\
 Data File : 08121901.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 12-Aug-2019, 10:41:50
 Operator : WH
 Sample : STD s32-05221901
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Aug 12 10:51:35 2019
 Quant Method : I:\GC10\METHODS\RS091217_R.M
 Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 QLast Update : Wed Sep 13 11:14:47 2017
 Response via : Initial Calibration
 Integrator: ChemStation

WH 8/12/19

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :

Compound	R.T.	Response	Conc	Units

Target Compounds				
1) Oxygen/Argon	0.000	0	N.D.	ppm
2) Carbon monoxide	0.000	0	N.D.	ppm
3) Methane (TCD)	0.000	0	N.D.	ppm
4) Carbon dioxide	0.000	0	N.D.	ppm
6) Methane (FID)	1.103	815988	89.959	ppm
7) Ethylene	1.662	1604692	95.892	ppm
8) Ethane	1.923	1618522	95.487	ppm
9) Propylene	4.299	2365048	100.934	ppm
10) Propane	4.423	2440922	98.107	ppm
11) Isobutylene	0.000	0	N.D.	ppm
12) Isobutane	0.000	0	N.D.	ppm
13) n-Butane	0.000	0	N.D.	ppm

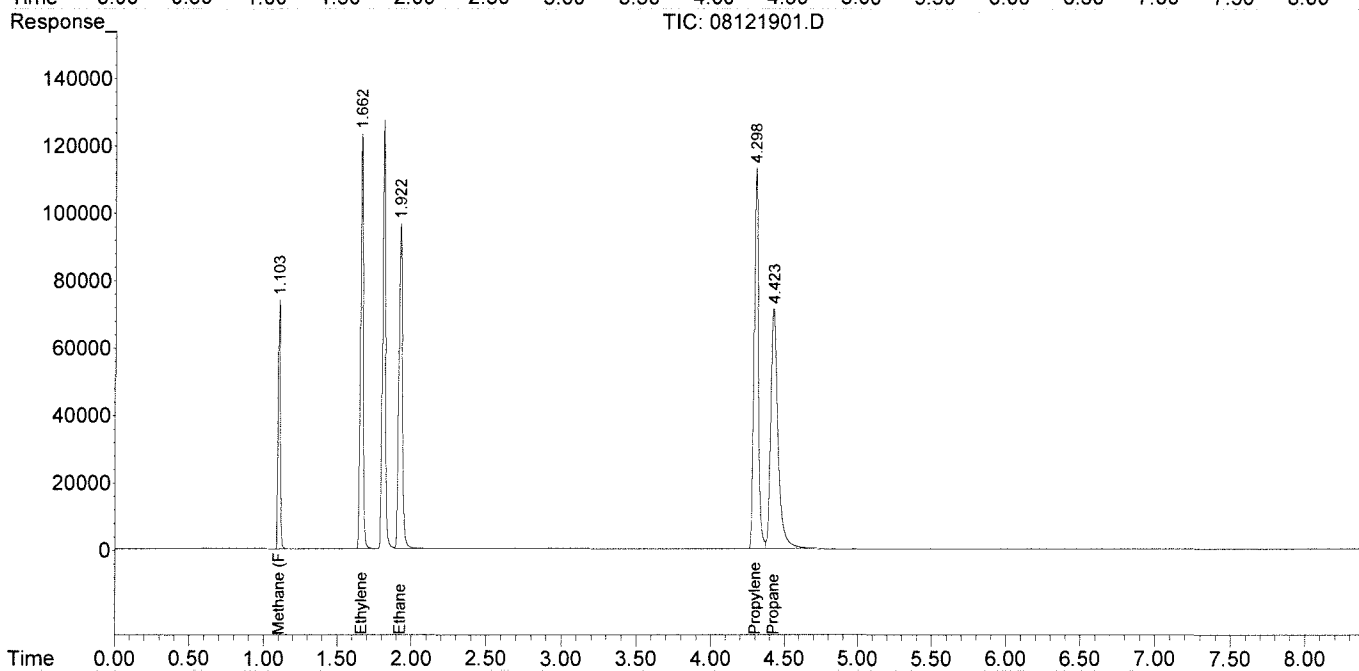
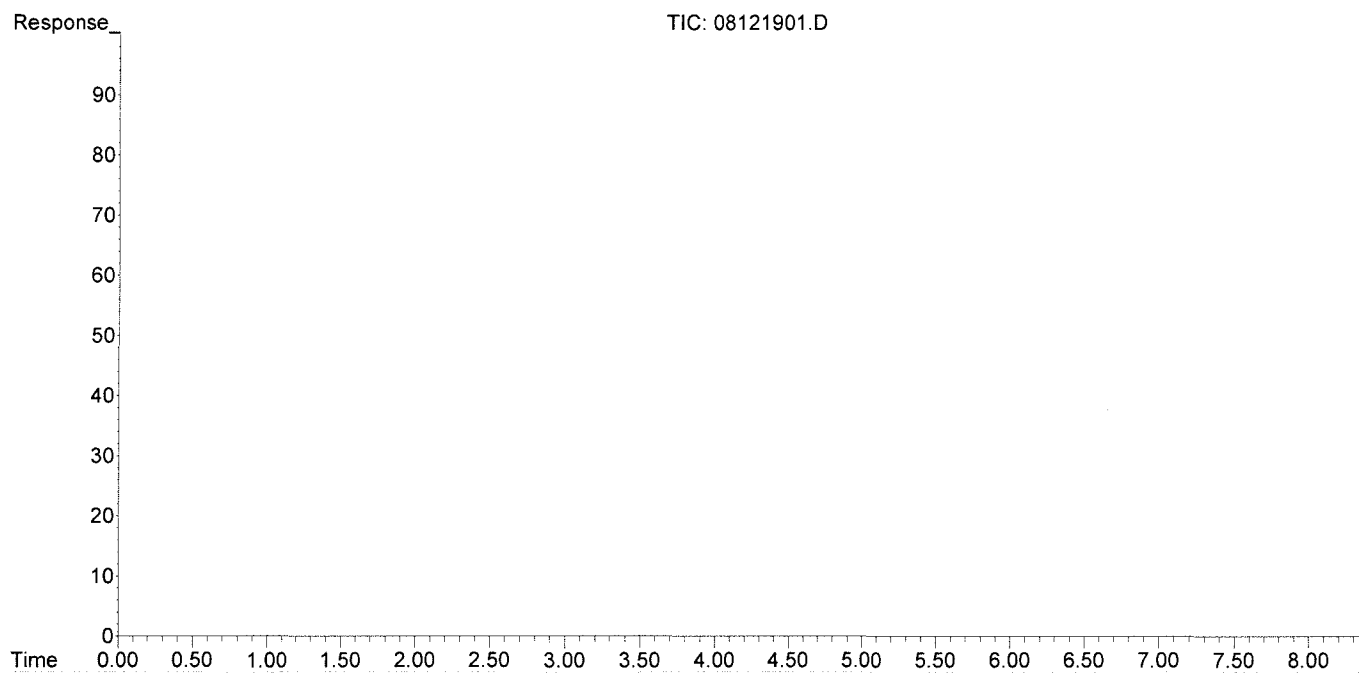
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2019_08\12\
Data File : 08121901.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Aug-2019, 10:41:50
Operator : WH
Sample : STD s32-05221901
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 12 10:51:35 2019
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



Data Path : J:\GC10\DATA\RSK_FID\2019_08\12\
 Data File : 08121914.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 12-Aug-2019, 15:10:15
 Operator : WH
 Sample : STD s32-05221901
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Aug 12 15:26:58 2019
 Quant Method : I:\GC10\METHODS\RS091217_R.M
 Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 QLast Update : Wed Sep 13 11:14:47 2017
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :

Compound	R.T.	Response	Conc	Units
Target Compounds				
1) Oxygen/Argon	0.000	0	N.D.	ppm
2) Carbon monoxide	0.000	0	N.D.	ppm
3) Methane (TCD)	0.000	0	N.D.	ppm
4) Carbon dioxide	0.000	0	N.D.	ppm
6) Methane (FID)	1.108	815059	89.857	ppm
7) Ethylene	1.669	1609077	96.154	ppm
8) Ethane	1.930	1624876	95.862	ppm
9) Propylene	4.304	2375229	101.369	ppm
10) Propane	4.428	2450175	98.479	ppm
11) Isobutylene	0.000	0	N.D.	ppm
12) Isobutane	0.000	0	N.D.	ppm
13) n-Butane	0.000	0	N.D.	ppm

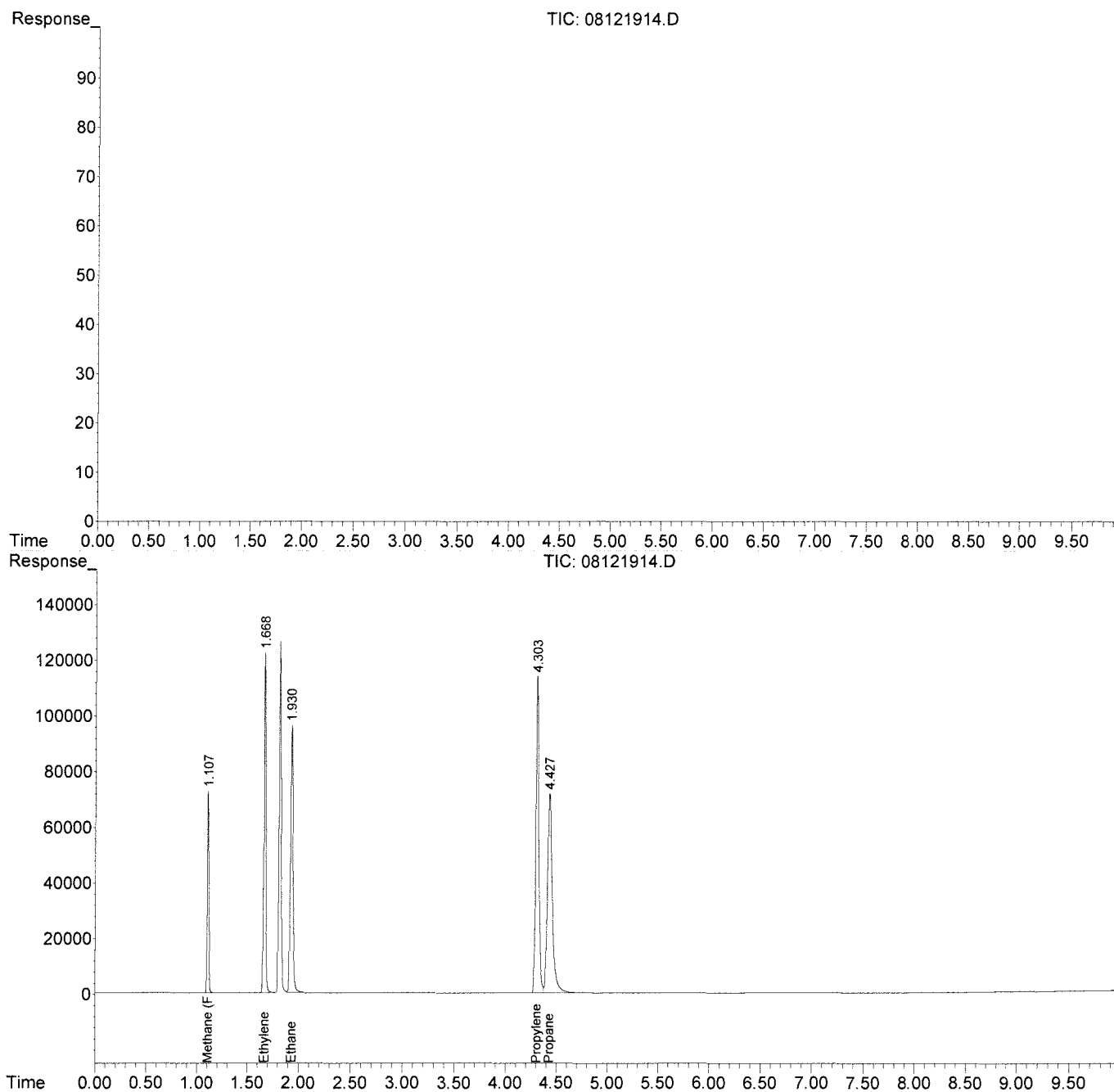
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2019_08\12\
Data File : 08121914.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 12-Aug-2019, 15:10:15
Operator : WH
Sample : STD s32-05221901
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 12 15:26:58 2019
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



Directory: I:\GC10\DATA\RSK_FID\2017_09\12\

	Date/Time	File Name	Sample ID	Misc Info	Operator	Acquisition Method	Comments
1	12-Sep-17, 08:38:08	09121701.D	test		MC	RSKBOTH.M	
2	12-Sep-17, 10:52:40	09121702.D	0.151ppm 0.250ml s32-09121702		MC	RSKBOTH.M	Curve
3	12-Sep-17, 11:05:49	09121703.D	0.302ppm 0.5ml s32-09121702		MC	RSKBOTH.M	Curve
4	12-Sep-17, 11:45:34	09121704.D	1.51ppm 0.1ml s32-09051701		MC	RSKBOTH.M	Curve
5	12-Sep-17, 12:09:33	09121705.D	4.53ppm 0.3ml s32-09051701		MC	RSKBOTH.M	Curve
6	12-Sep-17, 12:30:23	09121706.D	10.57ppm 0.7ml s32-09051701		MC	RSKBOTH.M	Curve
7	12-Sep-17, 12:47:18	09121707.D	200ppm 0.1ml s32-09121701		MC	RSKBOTH.M	Curve
8	12-Sep-17, 13:00:22	09121708.D	600ppm 0.3ml s32-09121701		MC	RSKBOTH.M	Curve
9	12-Sep-17, 13:47:48	09121709.D	1000ppm 0.5ml s32-09121701		MC	RSKBOTH.M	Curve
10	12-Sep-17, 14:07:58	09121710.D	2000ppm 1ml s32-09121701		MC	RSKBOTH.M	Curve
11	12-Sep-17, 14:48:48	09121711.D	4000ppm 0.1ml s32-08231701		MC	RSKBOTH.M	Curve
12	12-Sep-17, 15:21:51	09121712.D	20000ppm 0.5ml s32-08231701		MC	RSKBOTH.M	Curve
13	12-Sep-17, 15:38:59	09121713.D	mb 0.5ml		MC	RSKBOTH.M	Pass
14	12-Sep-17, 15:55:35	09121714.D	mb 0.1ml		MC	RSKBOTH.M	Pass
15	12-Sep-17, 16:15:26	09121715.D	icv s30-05241604		MC	RSKBOTH.M	Pass

Injection Log

Directory: I:\GC10\DATA\RSK_FID\2019_08\12\

	Date/Time	File Name	Sample ID	Misc Info	Operator	Acquisition Method	Comments
1	12-Aug-19, 10:41:50	08121901.D	STD s32-05221901		WH	RSKBOTH.M	
2	12-Aug-19, 10:56:55	08121902.D	rb 0.1 ml		WH	RSKBOTH.M	
3	12-Aug-19, 11:31:44	08121903.D	MCS 0.1 ml		WH	RSKBOTH.M	
4	12-Aug-19, 11:53:48	08121904.D	P1904674-001 0.1ml		WH	RSKBOTH.M	
5	12-Aug-19, 12:17:24	08121905.D	P1904674-002 0.1ml		WH	RSKBOTH.M	
6	12-Aug-19, 12:31:53	08121906.D	P1904674-003 0.1ml		WH	RSKBOTH.M	
7	12-Aug-19, 12:47:55	08121907.D	P1904674-004 0.1ml		WH	RSKBOTH.M	
8	12-Aug-19, 13:14:38	08121908.D	LCS FID		WH	RSKBOTH.M	
9	12-Aug-19, 13:34:04	08121909.D	LCSD FID		WH	RSKBOTH.M	
10	12-Aug-19, 14:06:21	08121910.D	K1906971-002 0.1ml		WH	RSKBOTH.M	
11	12-Aug-19, 14:26:37	08121911.D	K1906971-003 0.1ml		WH	RSKBOTH.M	
12	12-Aug-19, 14:40:07	08121912.D	K1906971-004 0.1ml		WH	RSKBOTH.M	
13	12-Aug-19, 14:53:08	08121913.D	K1906971-005 0.1ml		WH	RSKBOTH.M	
14	12-Aug-19, 15:10:15	08121914.D	STD s32-05221901		WH	RSKBOTH.M	
15	12-Aug-19, 15:29:58	08121915.D	K1906971-007 0.1ml		WH	RSKBOTH.M	
16	12-Aug-19, 15:46:09	08121916.D	K1906971-011 0.1ml		WH	RSKBOTH.M	
17	12-Aug-19, 15:59:01	08121917.D	K1906971-012 0.1ml		WH	RSKBOTH.M	
18	12-Aug-19, 16:13:54	08121918.D	K1906971-010 0.1ml		WH	RSKBOTH.M	
19	12-Aug-19, 16:36:32	08121919.D	K1906971-010ms 0.1ml		WH	RSKBOTH.M	
20	12-Aug-19, 16:48:05	08121920.D	K1906971-010msd 0.1ml		WH	RSKBOTH.M	
21	12-Aug-19, 17:00:07	08121921.D	STD s32-05221901		WH	RSKBOTH.M	



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August 21, 2019

Susan Huang
Aptim Environmental & Infrastructure, Inc.
2500 City West Blvd., Suite 1700
Houston, TX 77042

Work Order: **HS19080285**

Laboratory Results for: **Longhorn Army Ammunition Plant - LHAAP-37**

Dear Susan,

ALS Environmental received 9 sample(s) on Aug 07, 2019 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,

A handwritten signature in black ink, appearing to read 'Raj. P. Modashia', enclosed in a simple oval scribble.

Generated By: JUMOKE.LAWAL

RJ Modashia
Project Manager

ALS Houston, US

Date: 21-ago-19

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant - LHAAP-37
Work Order: HS19080285

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19080285-01	35BWW20-190806	Groundwater		06-Aug-2019 08:05	07-Aug-2019 08:50	<input type="checkbox"/>
HS19080285-02	35BWW20-190806-FD	Groundwater		06-Aug-2019 08:05	07-Aug-2019 08:50	<input type="checkbox"/>
HS19080285-03	35BWW10-190806	Groundwater		06-Aug-2019 08:55	07-Aug-2019 08:50	<input type="checkbox"/>
HS19080285-04	35BWW05-190806	Groundwater		06-Aug-2019 09:40	07-Aug-2019 08:50	<input type="checkbox"/>
HS19080285-05	35BWW26-190806	Groundwater		06-Aug-2019 10:25	07-Aug-2019 08:50	<input type="checkbox"/>
HS19080285-06	35BWW14-190806	Groundwater		06-Aug-2019 11:25	07-Aug-2019 08:50	<input type="checkbox"/>
HS19080285-07	35BWW23-190806	Groundwater		06-Aug-2019 12:20	07-Aug-2019 08:50	<input type="checkbox"/>
HS19080285-08	35BWW13-190806	Groundwater		06-Aug-2019 13:10	07-Aug-2019 08:50	<input type="checkbox"/>
HS19080285-09	Trip Blank	Groundwater	CG 062119 -166	06-Aug-2019 00:00	07-Aug-2019 08:50	<input type="checkbox"/>

ALS Houston, US

Date: 21-Aug-19

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant - LHAAP-37
Work Order:

CASE NARRATIVE

Work Order Comments

- The analysis for Methane, Methene, Ethane and CO2 by RSK175 was subcontracted to ALS Simi Valley, CA. Final report attached.
 - The analysis for TOC was subcontracted to ALS Kelso , WA. Final report attached.
-

GCMS Volatiles by Method SW8260**Batch ID: R343919****Sample ID: HS19080238-03MS**

- MS and MSD are for an unrelated sample
-

WetChemistry by Method SW9056**Batch ID: R343851**

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

ALS Houston, US

Date: 21-Aug-19

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant - LHAAP-37
 Sample ID: 35BWW20-190806
 Collection Date: 06-Aug-2019 08:05

ANALYTICAL REPORT
 WorkOrder:HS19080285
 Lab ID:HS19080285-01
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED	
VOLATILES ORGANICS BY METHOD 8260C		Method:SW8260							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 18:34	
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 18:34	
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	08-Aug-2019 18:34	
1,1,2-Trichlor-1,2,2-trifluoroethane	3.2		0.50	0.50	1.0	UG/L	1	08-Aug-2019 18:34	
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 18:34	
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 18:34	
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 18:34	
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 18:34	
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	08-Aug-2019 18:34	
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	08-Aug-2019 18:34	
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	08-Aug-2019 18:34	
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 18:34	
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 18:34	
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 18:34	
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	08-Aug-2019 18:34	
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 18:34	
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	08-Aug-2019 18:34	
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 18:34	
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	08-Aug-2019 18:34	
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 18:34	
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	08-Aug-2019 18:34	
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 18:34	
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	08-Aug-2019 18:34	
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 18:34	
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	08-Aug-2019 18:34	
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	08-Aug-2019 18:34	
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 18:34	
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	08-Aug-2019 18:34	
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	08-Aug-2019 18:34	
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 18:34	
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	08-Aug-2019 18:34	
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 18:34	
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 18:34	
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	08-Aug-2019 18:34	
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	08-Aug-2019 18:34	
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	08-Aug-2019 18:34	
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	08-Aug-2019 18:34	
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 18:34	

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

ALS Houston, US

Date: 21-Aug-19

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant - LHAAP-37
 Sample ID: 35BWW20-190806
 Collection Date: 06-Aug-2019 08:05

ANALYTICAL REPORT
 WorkOrder:HS19080285
 Lab ID:HS19080285-01
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED	
VOLATILES ORGANICS BY METHOD 8260C		Method:SW8260							Analyst: PC
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 18:34	
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 18:34	
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 18:34	
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 18:34	
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	08-Aug-2019 18:34	
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 18:34	
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 18:34	
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 18:34	
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 18:34	
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	08-Aug-2019 18:34	
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 18:34	
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	08-Aug-2019 18:34	
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	08-Aug-2019 18:34	
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	08-Aug-2019 18:34	
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 18:34	
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 18:34	
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 18:34	
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 18:34	
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 18:34	
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 18:34	
Tetrachloroethene	7.5		0.30	0.50	1.0	UG/L	1	08-Aug-2019 18:34	
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 18:34	
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 18:34	
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 18:34	
Trichloroethene	2.1		0.20	0.50	1.0	UG/L	1	08-Aug-2019 18:34	
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 18:34	
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 18:34	
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>89.9</i>			0	<i>81-118</i>	<i>%REC</i>	1	<i>08-Aug-2019 18:34</i>	
<i>Surr: 4-Bromofluorobenzene</i>	<i>97.8</i>			0	<i>85-114</i>	<i>%REC</i>	1	<i>08-Aug-2019 18:34</i>	
<i>Surr: Dibromofluoromethane</i>	<i>91.8</i>			0	<i>80-119</i>	<i>%REC</i>	1	<i>08-Aug-2019 18:34</i>	
<i>Surr: Toluene-d8</i>	<i>102</i>			0	<i>89-112</i>	<i>%REC</i>	1	<i>08-Aug-2019 18:34</i>	

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

ALS Houston, US

Date: 21-Aug-19

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant - LHAAP-37
 Sample ID: 35BWW20-190806-FD
 Collection Date: 06-Aug-2019 08:05

ANALYTICAL REPORT
 WorkOrder:HS19080285
 Lab ID:HS19080285-02
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED	
VOLATILES ORGANICS BY METHOD 8260C		Method:SW8260							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 18:58	
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 18:58	
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	08-Aug-2019 18:58	
1,1,2-Trichlor-1,2,2-trifluoroethane	3.1		0.50	0.50	1.0	UG/L	1	08-Aug-2019 18:58	
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 18:58	
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 18:58	
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 18:58	
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 18:58	
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	08-Aug-2019 18:58	
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	08-Aug-2019 18:58	
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	08-Aug-2019 18:58	
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 18:58	
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 18:58	
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 18:58	
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	08-Aug-2019 18:58	
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 18:58	
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	08-Aug-2019 18:58	
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 18:58	
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	08-Aug-2019 18:58	
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 18:58	
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	08-Aug-2019 18:58	
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 18:58	
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	08-Aug-2019 18:58	
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 18:58	
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	08-Aug-2019 18:58	
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	08-Aug-2019 18:58	
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 18:58	
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	08-Aug-2019 18:58	
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	08-Aug-2019 18:58	
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 18:58	
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	08-Aug-2019 18:58	
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 18:58	
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 18:58	
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	08-Aug-2019 18:58	
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	08-Aug-2019 18:58	
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	08-Aug-2019 18:58	
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	08-Aug-2019 18:58	
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 18:58	

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

ALS Houston, US

Date: 21-Aug-19

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant - LHAAP-37
 Sample ID: 35BWW20-190806-FD
 Collection Date: 06-Aug-2019 08:05

ANALYTICAL REPORT
 WorkOrder:HS19080285
 Lab ID:HS19080285-02
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED	
VOLATILES ORGANICS BY METHOD 8260C		Method:SW8260							Analyst: PC
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 18:58	
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 18:58	
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 18:58	
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 18:58	
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	08-Aug-2019 18:58	
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 18:58	
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 18:58	
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 18:58	
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 18:58	
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	08-Aug-2019 18:58	
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 18:58	
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	08-Aug-2019 18:58	
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	08-Aug-2019 18:58	
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	08-Aug-2019 18:58	
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 18:58	
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 18:58	
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 18:58	
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 18:58	
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 18:58	
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 18:58	
Tetrachloroethene	7.6		0.30	0.50	1.0	UG/L	1	08-Aug-2019 18:58	
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 18:58	
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 18:58	
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 18:58	
Trichloroethene	2.0		0.20	0.50	1.0	UG/L	1	08-Aug-2019 18:58	
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 18:58	
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 18:58	
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>90.8</i>			0	<i>81-118</i>	<i>%REC</i>	1	<i>08-Aug-2019 18:58</i>	
<i>Surr: 4-Bromofluorobenzene</i>	<i>102</i>			0	<i>85-114</i>	<i>%REC</i>	1	<i>08-Aug-2019 18:58</i>	
<i>Surr: Dibromofluoromethane</i>	<i>92.0</i>			0	<i>80-119</i>	<i>%REC</i>	1	<i>08-Aug-2019 18:58</i>	
<i>Surr: Toluene-d8</i>	<i>102</i>			0	<i>89-112</i>	<i>%REC</i>	1	<i>08-Aug-2019 18:58</i>	

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

ALS Houston, US

Date: 21-Aug-19

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant - LHAAP-37
 Sample ID: 35BWW10-190806
 Collection Date: 06-Aug-2019 08:55

ANALYTICAL REPORT
 WorkOrder:HS19080285
 Lab ID:HS19080285-03
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED	
VOLATILES ORGANICS BY METHOD 8260C		Method:SW8260							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 19:22	
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 19:22	
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	08-Aug-2019 19:22	
1,1,2-Trichlor-1,2,2-trifluoroethane	2.0		0.50	0.50	1.0	UG/L	1	08-Aug-2019 19:22	
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 19:22	
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 19:22	
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 19:22	
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 19:22	
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	08-Aug-2019 19:22	
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	08-Aug-2019 19:22	
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	08-Aug-2019 19:22	
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 19:22	
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 19:22	
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 19:22	
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	08-Aug-2019 19:22	
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 19:22	
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	08-Aug-2019 19:22	
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 19:22	
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	08-Aug-2019 19:22	
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 19:22	
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	08-Aug-2019 19:22	
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 19:22	
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	08-Aug-2019 19:22	
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 19:22	
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	08-Aug-2019 19:22	
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	08-Aug-2019 19:22	
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 19:22	
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	08-Aug-2019 19:22	
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	08-Aug-2019 19:22	
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 19:22	
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	08-Aug-2019 19:22	
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 19:22	
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 19:22	
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	08-Aug-2019 19:22	
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	08-Aug-2019 19:22	
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	08-Aug-2019 19:22	
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	08-Aug-2019 19:22	
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 19:22	

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

ALS Houston, US

Date: 21-Aug-19

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant - LHAAP-37
 Sample ID: 35BWW10-190806
 Collection Date: 06-Aug-2019 08:55

ANALYTICAL REPORT
 WorkOrder:HS19080285
 Lab ID:HS19080285-03
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED	
VOLATILES ORGANICS BY METHOD 8260C		Method:SW8260							Analyst: PC
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 19:22	
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 19:22	
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 19:22	
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 19:22	
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	08-Aug-2019 19:22	
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 19:22	
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 19:22	
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 19:22	
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 19:22	
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	08-Aug-2019 19:22	
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 19:22	
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	08-Aug-2019 19:22	
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	08-Aug-2019 19:22	
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	08-Aug-2019 19:22	
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 19:22	
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 19:22	
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 19:22	
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 19:22	
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 19:22	
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 19:22	
Tetrachloroethene	1.6		0.30	0.50	1.0	UG/L	1	08-Aug-2019 19:22	
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 19:22	
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 19:22	
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 19:22	
Trichloroethene	2.6		0.20	0.50	1.0	UG/L	1	08-Aug-2019 19:22	
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 19:22	
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 19:22	
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>90.0</i>			0	<i>81-118</i>	<i>%REC</i>	1	<i>08-Aug-2019 19:22</i>	
<i>Surr: 4-Bromofluorobenzene</i>	<i>98.7</i>			0	<i>85-114</i>	<i>%REC</i>	1	<i>08-Aug-2019 19:22</i>	
<i>Surr: Dibromofluoromethane</i>	<i>90.5</i>			0	<i>80-119</i>	<i>%REC</i>	1	<i>08-Aug-2019 19:22</i>	
<i>Surr: Toluene-d8</i>	<i>104</i>			0	<i>89-112</i>	<i>%REC</i>	1	<i>08-Aug-2019 19:22</i>	

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

ALS Houston, US

Date: 21-Aug-19

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant - LHAAP-37
 Sample ID: 35BWW05-190806
 Collection Date: 06-Aug-2019 09:40

ANALYTICAL REPORT
 WorkOrder:HS19080285
 Lab ID:HS19080285-04
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED	
VOLATILES ORGANICS BY METHOD 8260C		Method:SW8260							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 19:46	
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 19:46	
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	08-Aug-2019 19:46	
1,1,2-Trichlor-1,2,2-trifluoroethane	0.50	U	0.50	0.50	1.0	UG/L	1	08-Aug-2019 19:46	
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 19:46	
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 19:46	
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 19:46	
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 19:46	
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	08-Aug-2019 19:46	
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	08-Aug-2019 19:46	
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	08-Aug-2019 19:46	
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 19:46	
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 19:46	
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 19:46	
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	08-Aug-2019 19:46	
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 19:46	
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	08-Aug-2019 19:46	
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 19:46	
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	08-Aug-2019 19:46	
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 19:46	
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	08-Aug-2019 19:46	
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 19:46	
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	08-Aug-2019 19:46	
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 19:46	
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	08-Aug-2019 19:46	
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	08-Aug-2019 19:46	
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 19:46	
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	08-Aug-2019 19:46	
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	08-Aug-2019 19:46	
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 19:46	
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	08-Aug-2019 19:46	
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 19:46	
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 19:46	
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	08-Aug-2019 19:46	
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	08-Aug-2019 19:46	
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	08-Aug-2019 19:46	
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	08-Aug-2019 19:46	
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 19:46	
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 19:46	

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

ALS Houston, US

Date: 21-Aug-19

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant - LHAAP-37
 Sample ID: 35BWW05-190806
 Collection Date: 06-Aug-2019 09:40

ANALYTICAL REPORT
 WorkOrder:HS19080285
 Lab ID:HS19080285-04
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED	
VOLATILES ORGANICS BY METHOD 8260C		Method:SW8260							Analyst: PC
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 19:46	
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 19:46	
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 19:46	
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	08-Aug-2019 19:46	
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 19:46	
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 19:46	
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 19:46	
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 19:46	
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	08-Aug-2019 19:46	
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 19:46	
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	08-Aug-2019 19:46	
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	08-Aug-2019 19:46	
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	08-Aug-2019 19:46	
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 19:46	
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 19:46	
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 19:46	
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 19:46	
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 19:46	
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 19:46	
Tetrachloroethene	1.9		0.30	0.50	1.0	UG/L	1	08-Aug-2019 19:46	
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 19:46	
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 19:46	
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 19:46	
Trichloroethene	8.6		0.20	0.50	1.0	UG/L	1	08-Aug-2019 19:46	
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 19:46	
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 19:46	
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>90.7</i>			0	<i>81-118</i>	<i>%REC</i>	1	08-Aug-2019 19:46	
<i>Surr: 4-Bromofluorobenzene</i>	<i>101</i>			0	<i>85-114</i>	<i>%REC</i>	1	08-Aug-2019 19:46	
<i>Surr: Dibromofluoromethane</i>	<i>92.7</i>			0	<i>80-119</i>	<i>%REC</i>	1	08-Aug-2019 19:46	
<i>Surr: Toluene-d8</i>	<i>99.9</i>			0	<i>89-112</i>	<i>%REC</i>	1	08-Aug-2019 19:46	

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

ALS Houston, US

Date: 21-Aug-19

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant - LHAAP-37
 Sample ID: 35BWW26-190806
 Collection Date: 06-Aug-2019 10:25

ANALYTICAL REPORT
 WorkOrder:HS19080285
 Lab ID:HS19080285-05
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED	
VOLATILES ORGANICS BY METHOD		Method:SW8260							Analyst: PC
8260C									
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 20:10	
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 20:10	
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	08-Aug-2019 20:10	
1,1,2-Trichlor-1,2,2-trifluoroethane	0.50	U	0.50	0.50	1.0	UG/L	1	08-Aug-2019 20:10	
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 20:10	
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 20:10	
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 20:10	
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 20:10	
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	08-Aug-2019 20:10	
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	08-Aug-2019 20:10	
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	08-Aug-2019 20:10	
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 20:10	
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 20:10	
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 20:10	
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	08-Aug-2019 20:10	
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 20:10	
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	08-Aug-2019 20:10	
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 20:10	
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	08-Aug-2019 20:10	
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 20:10	
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	08-Aug-2019 20:10	
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 20:10	
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	08-Aug-2019 20:10	
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 20:10	
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	08-Aug-2019 20:10	
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	08-Aug-2019 20:10	
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 20:10	
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	08-Aug-2019 20:10	
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	08-Aug-2019 20:10	
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 20:10	
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	08-Aug-2019 20:10	
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 20:10	
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 20:10	
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	08-Aug-2019 20:10	
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	08-Aug-2019 20:10	
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	08-Aug-2019 20:10	
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	08-Aug-2019 20:10	
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 20:10	
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 20:10	

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

ALS Houston, US

Date: 21-Aug-19

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant - LHAAP-37
 Sample ID: 35BWW26-190806
 Collection Date: 06-Aug-2019 10:25

ANALYTICAL REPORT
 WorkOrder:HS19080285
 Lab ID:HS19080285-05
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED	
VOLATILES ORGANICS BY METHOD 8260C		Method:SW8260							Analyst: PC
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 20:10	
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 20:10	
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 20:10	
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	08-Aug-2019 20:10	
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 20:10	
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 20:10	
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 20:10	
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 20:10	
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	08-Aug-2019 20:10	
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 20:10	
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	08-Aug-2019 20:10	
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	08-Aug-2019 20:10	
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	08-Aug-2019 20:10	
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 20:10	
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 20:10	
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 20:10	
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 20:10	
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 20:10	
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 20:10	
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 20:10	
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 20:10	
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 20:10	
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 20:10	
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 20:10	
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 20:10	
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 20:10	
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>91.0</i>			0	<i>81-118</i>	%REC	1	<i>08-Aug-2019 20:10</i>	
<i>Surr: 4-Bromofluorobenzene</i>	<i>99.9</i>			0	<i>85-114</i>	%REC	1	<i>08-Aug-2019 20:10</i>	
<i>Surr: Dibromofluoromethane</i>	<i>93.2</i>			0	<i>80-119</i>	%REC	1	<i>08-Aug-2019 20:10</i>	
<i>Surr: Toluene-d8</i>	<i>103</i>			0	<i>89-112</i>	%REC	1	<i>08-Aug-2019 20:10</i>	
ANIONS BY SW9056A		Method:SW9056							Analyst: KMU
Chloride	29.3		0.200	0.500	0.500	mg/L	1	07-Aug-2019 16:05	
Nitrogen, Nitrate (As N)	0.100	U	0.0300	0.100	0.100	mg/L	1	07-Aug-2019 16:05	
Sulfate	24.5		0.200	0.500	0.500	mg/L	1	07-Aug-2019 16:05	
SUBCONTRACT ANALYSIS - RSK		Method:NA							Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	20-Aug-2019 14:27	
SUBCONTRACT ANALYSIS - TOC ANALYSIS		Method:NA							Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	21-Aug-2019 09:17	

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

ALS Houston, US

Date: 21-Aug-19

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant - LHAAP-37
 Sample ID: 35BWW14-190806
 Collection Date: 06-Aug-2019 11:25

ANALYTICAL REPORT
 WorkOrder:HS19080285
 Lab ID:HS19080285-06
 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	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 20:34	
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 20:34	
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	08-Aug-2019 20:34	
1,1,2-Trichlor-1,2,2-trifluoroethane	25		0.50	0.50	1.0	UG/L	1	08-Aug-2019 20:34	
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 20:34	
1,1-Dichloroethane	0.58	J	0.20	0.50	1.0	UG/L	1	08-Aug-2019 20:34	
1,1-Dichloroethene	4.2		0.20	0.50	1.0	UG/L	1	08-Aug-2019 20:34	
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 20:34	
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	08-Aug-2019 20:34	
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	08-Aug-2019 20:34	
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	08-Aug-2019 20:34	
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 20:34	
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 20:34	
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 20:34	
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	08-Aug-2019 20:34	
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 20:34	
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	08-Aug-2019 20:34	
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 20:34	
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	08-Aug-2019 20:34	
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 20:34	
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	08-Aug-2019 20:34	
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 20:34	
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	08-Aug-2019 20:34	
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 20:34	
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	08-Aug-2019 20:34	
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	08-Aug-2019 20:34	
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 20:34	
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	08-Aug-2019 20:34	
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	08-Aug-2019 20:34	
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 20:34	
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	08-Aug-2019 20:34	
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 20:34	
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 20:34	
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	08-Aug-2019 20:34	
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	08-Aug-2019 20:34	
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	08-Aug-2019 20:34	
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	08-Aug-2019 20:34	
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 20:34	

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

ALS Houston, US

Date: 21-Aug-19

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant - LHAAP-37
 Sample ID: 35BWW14-190806
 Collection Date: 06-Aug-2019 11:25

ANALYTICAL REPORT
 WorkOrder:HS19080285
 Lab ID:HS19080285-06
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED	
VOLATILES ORGANICS BY METHOD 8260C		Method:SW8260						Analyst: PC	
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 20:34	
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 20:34	
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 20:34	
cis-1,2-Dichloroethene	1.3		0.20	0.50	1.0	UG/L	1	08-Aug-2019 20:34	
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	08-Aug-2019 20:34	
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 20:34	
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 20:34	
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 20:34	
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 20:34	
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	08-Aug-2019 20:34	
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 20:34	
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	08-Aug-2019 20:34	
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	08-Aug-2019 20:34	
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	08-Aug-2019 20:34	
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 20:34	
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 20:34	
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 20:34	
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 20:34	
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 20:34	
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 20:34	
Tetrachloroethene	38		0.30	0.50	1.0	UG/L	1	08-Aug-2019 20:34	
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 20:34	
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 20:34	
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 20:34	
Trichloroethene	15		0.20	0.50	1.0	UG/L	1	08-Aug-2019 20:34	
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 20:34	
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 20:34	
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>88.5</i>			0	<i>81-118</i>	<i>%REC</i>	1	<i>08-Aug-2019 20:34</i>	
<i>Surr: 4-Bromofluorobenzene</i>	<i>100</i>			0	<i>85-114</i>	<i>%REC</i>	1	<i>08-Aug-2019 20:34</i>	
<i>Surr: Dibromofluoromethane</i>	<i>91.9</i>			0	<i>80-119</i>	<i>%REC</i>	1	<i>08-Aug-2019 20:34</i>	
<i>Surr: Toluene-d8</i>	<i>101</i>			0	<i>89-112</i>	<i>%REC</i>	1	<i>08-Aug-2019 20:34</i>	
ANIONS BY SW9056A		Method:SW9056						Analyst: KMU	
Chloride	20.8		0.200	0.500	0.500	mg/L	1	07-Aug-2019 16:20	
Nitrogen, Nitrate (As N)	0.357		0.0300	0.100	0.100	mg/L	1	07-Aug-2019 16:20	
Sulfate	81.4		0.200	0.500	0.500	mg/L	1	07-Aug-2019 16:20	
SUBCONTRACT ANALYSIS - RSK		Method:NA						Analyst: SUB	
Subcontract Analysis	See Attached		0	0		NA	1	20-Aug-2019 14:27	

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

ALS Houston, US

Date: 21-Aug-19

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant - LHAAP-37
 Sample ID: 35BWW14-190806
 Collection Date: 06-Aug-2019 11:25

ANALYTICAL REPORT

WorkOrder:HS19080285
 Lab ID:HS19080285-06
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
SUBCONTRACT ANALYSIS - TOC ANALYSIS		Method:NA		Analyst: SUBK				
Subcontract Analysis	See Attached		0	0		NA	1	21-Aug-2019 09:17

ALS Houston, US

Date: 21-Aug-19

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant - LHAAP-37
 Sample ID: 35BWW23-190806
 Collection Date: 06-Aug-2019 12:20

ANALYTICAL REPORT

WorkOrder:HS19080285
 Lab ID:HS19080285-07
 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	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 20:58	
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 20:58	
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	08-Aug-2019 20:58	
1,1,2-Trichlor-1,2,2-trifluoroethane	0.50	U	0.50	0.50	1.0	UG/L	1	08-Aug-2019 20:58	
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 20:58	
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 20:58	
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 20:58	
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 20:58	
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	08-Aug-2019 20:58	
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	08-Aug-2019 20:58	
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	08-Aug-2019 20:58	
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 20:58	
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 20:58	
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 20:58	
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	08-Aug-2019 20:58	
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 20:58	
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	08-Aug-2019 20:58	
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 20:58	
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	08-Aug-2019 20:58	
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 20:58	
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	08-Aug-2019 20:58	
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 20:58	
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	08-Aug-2019 20:58	
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 20:58	
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	08-Aug-2019 20:58	
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	08-Aug-2019 20:58	
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 20:58	
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	08-Aug-2019 20:58	
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	08-Aug-2019 20:58	
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 20:58	
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	08-Aug-2019 20:58	
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 20:58	
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 20:58	
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	08-Aug-2019 20:58	
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	08-Aug-2019 20:58	
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	08-Aug-2019 20:58	
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	08-Aug-2019 20:58	
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 20:58	
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 20:58	

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

ALS Houston, US

Date: 21-Aug-19

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant - LHAAP-37
 Sample ID: 35BWW23-190806
 Collection Date: 06-Aug-2019 12:20

ANALYTICAL REPORT
 WorkOrder:HS19080285
 Lab ID:HS19080285-07
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED	
VOLATILES ORGANICS BY METHOD 8260C		Method:SW8260							Analyst: PC
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 20:58	
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 20:58	
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 20:58	
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	08-Aug-2019 20:58	
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 20:58	
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 20:58	
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 20:58	
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 20:58	
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	08-Aug-2019 20:58	
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 20:58	
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	08-Aug-2019 20:58	
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	08-Aug-2019 20:58	
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	08-Aug-2019 20:58	
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 20:58	
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 20:58	
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 20:58	
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 20:58	
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 20:58	
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 20:58	
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 20:58	
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 20:58	
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 20:58	
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 20:58	
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 20:58	
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 20:58	
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 20:58	
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>92.2</i>			0	<i>81-118</i>	%REC	1	<i>08-Aug-2019 20:58</i>	
<i>Surr: 4-Bromofluorobenzene</i>	<i>99.0</i>			0	<i>85-114</i>	%REC	1	<i>08-Aug-2019 20:58</i>	
<i>Surr: Dibromofluoromethane</i>	<i>94.2</i>			0	<i>80-119</i>	%REC	1	<i>08-Aug-2019 20:58</i>	
<i>Surr: Toluene-d8</i>	<i>102</i>			0	<i>89-112</i>	%REC	1	<i>08-Aug-2019 20:58</i>	
ANIONS BY SW9056A		Method:SW9056							Analyst: KMU
Chloride	31.7		0.200	0.500	0.500	mg/L	1	07-Aug-2019 16:34	
Nitrogen, Nitrate (As N)	0.100	U	0.0300	0.100	0.100	mg/L	1	07-Aug-2019 16:34	
Sulfate	86.3		0.200	0.500	0.500	mg/L	1	07-Aug-2019 16:34	
SUBCONTRACT ANALYSIS - RSK		Method:NA							Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	20-Aug-2019 14:27	
SUBCONTRACT ANALYSIS - TOC ANALYSIS		Method:NA							Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	21-Aug-2019 09:17	

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

ALS Houston, US

Date: 21-Aug-19

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant - LHAAP-37
 Sample ID: 35BWW13-190806
 Collection Date: 06-Aug-2019 13:10

ANALYTICAL REPORT
 WorkOrder:HS19080285
 Lab ID:HS19080285-08
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD		Method:SW8260						
8260C								Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 21:22
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 21:22
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	08-Aug-2019 21:22
1,1,2-Trichlor-1,2,2-trifluoroethane	0.50	U	0.50	0.50	1.0	UG/L	1	08-Aug-2019 21:22
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 21:22
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 21:22
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 21:22
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 21:22
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	08-Aug-2019 21:22
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	08-Aug-2019 21:22
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	08-Aug-2019 21:22
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 21:22
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 21:22
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 21:22
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	08-Aug-2019 21:22
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 21:22
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	08-Aug-2019 21:22
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 21:22
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	08-Aug-2019 21:22
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 21:22
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	08-Aug-2019 21:22
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 21:22
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	08-Aug-2019 21:22
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 21:22
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	08-Aug-2019 21:22
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	08-Aug-2019 21:22
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 21:22
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	08-Aug-2019 21:22
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	08-Aug-2019 21:22
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 21:22
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	08-Aug-2019 21:22
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 21:22
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 21:22
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	08-Aug-2019 21:22
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	08-Aug-2019 21:22
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	08-Aug-2019 21:22
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	08-Aug-2019 21:22
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 21:22
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 21:22

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

ALS Houston, US

Date: 21-Aug-19

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant - LHAAP-37
 Sample ID: 35BWW13-190806
 Collection Date: 06-Aug-2019 13:10

ANALYTICAL REPORT

WorkOrder:HS19080285
 Lab ID:HS19080285-08
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD		Method:SW8260						
8260C								Analyst: PC
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 21:22
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 21:22
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 21:22
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	08-Aug-2019 21:22
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 21:22
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 21:22
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 21:22
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 21:22
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	08-Aug-2019 21:22
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 21:22
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	08-Aug-2019 21:22
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	08-Aug-2019 21:22
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	08-Aug-2019 21:22
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 21:22
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 21:22
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 21:22
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 21:22
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 21:22
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 21:22
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 21:22
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 21:22
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 21:22
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 21:22
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 21:22
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 21:22
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 21:22
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>88.5</i>			<i>0</i>	<i>81-118</i>	<i>%REC</i>	<i>1</i>	<i>08-Aug-2019 21:22</i>
<i>Surr: 4-Bromofluorobenzene</i>	<i>101</i>			<i>0</i>	<i>85-114</i>	<i>%REC</i>	<i>1</i>	<i>08-Aug-2019 21:22</i>
<i>Surr: Dibromofluoromethane</i>	<i>91.7</i>			<i>0</i>	<i>80-119</i>	<i>%REC</i>	<i>1</i>	<i>08-Aug-2019 21:22</i>
<i>Surr: Toluene-d8</i>	<i>99.9</i>			<i>0</i>	<i>89-112</i>	<i>%REC</i>	<i>1</i>	<i>08-Aug-2019 21:22</i>

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

ALS Houston, US

Date: 21-Aug-19

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant - LHAAP-37
 Sample ID: Trip Blank
 Collection Date: 06-Aug-2019 00:00

ANALYTICAL REPORT

WorkOrder:HS19080285
 Lab ID:HS19080285-09
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED	
VOLATILES ORGANICS BY METHOD 8260C		Method:SW8260							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 17:46	
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 17:46	
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	08-Aug-2019 17:46	
1,1,2-Trichlor-1,2,2-trifluoroethane	0.50	U	0.50	0.50	1.0	UG/L	1	08-Aug-2019 17:46	
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 17:46	
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 17:46	
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 17:46	
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 17:46	
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	08-Aug-2019 17:46	
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	08-Aug-2019 17:46	
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	08-Aug-2019 17:46	
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 17:46	
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 17:46	
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 17:46	
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	08-Aug-2019 17:46	
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 17:46	
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	08-Aug-2019 17:46	
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 17:46	
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	08-Aug-2019 17:46	
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 17:46	
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	08-Aug-2019 17:46	
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 17:46	
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	08-Aug-2019 17:46	
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 17:46	
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	08-Aug-2019 17:46	
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	08-Aug-2019 17:46	
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 17:46	
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	08-Aug-2019 17:46	
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	08-Aug-2019 17:46	
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 17:46	
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	08-Aug-2019 17:46	
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 17:46	
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 17:46	
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	08-Aug-2019 17:46	
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	08-Aug-2019 17:46	
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	08-Aug-2019 17:46	
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	08-Aug-2019 17:46	
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 17:46	
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 17:46	

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

ALS Houston, US

Date: 21-Aug-19

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant - LHAAP-37
 Sample ID: Trip Blank
 Collection Date: 06-Aug-2019 00:00

ANALYTICAL REPORT

WorkOrder:HS19080285
 Lab ID:HS19080285-09
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED	
VOLATILES ORGANICS BY METHOD 8260C		Method:SW8260							Analyst: PC
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 17:46	
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 17:46	
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 17:46	
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	08-Aug-2019 17:46	
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 17:46	
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 17:46	
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 17:46	
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 17:46	
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	08-Aug-2019 17:46	
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 17:46	
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	08-Aug-2019 17:46	
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	08-Aug-2019 17:46	
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	08-Aug-2019 17:46	
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 17:46	
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 17:46	
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 17:46	
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 17:46	
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 17:46	
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 17:46	
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 17:46	
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 17:46	
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 17:46	
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 17:46	
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 17:46	
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	08-Aug-2019 17:46	
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	08-Aug-2019 17:46	
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>90.0</i>			0	<i>81-118</i>	<i>%REC</i>	<i>1</i>	<i>08-Aug-2019 17:46</i>	
<i>Surr: 4-Bromofluorobenzene</i>	<i>101</i>			0	<i>85-114</i>	<i>%REC</i>	<i>1</i>	<i>08-Aug-2019 17:46</i>	
<i>Surr: Dibromofluoromethane</i>	<i>92.5</i>			0	<i>80-119</i>	<i>%REC</i>	<i>1</i>	<i>08-Aug-2019 17:46</i>	
<i>Surr: Toluene-d8</i>	<i>102</i>			0	<i>89-112</i>	<i>%REC</i>	<i>1</i>	<i>08-Aug-2019 17:46</i>	

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

ALS Houston, US

Date: 21-ago-19

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant - LHAAP-37
WorkOrder: HS19080285

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID: R343851 (0)		Test Name : ANIONS BY SW9056A			Matrix: Groundwater	
HS19080285-05	35BWW26-190806	06 Aug 2019 10:25			07 Aug 2019 16:05	1
HS19080285-06	35BWW14-190806	06 Aug 2019 11:25			07 Aug 2019 16:20	1
HS19080285-07	35BWW23-190806	06 Aug 2019 12:20			07 Aug 2019 16:34	1
Batch ID: R343919 (0)		Test Name : VOLATILES ORGANICS BY METHOD 8260C			Matrix: Groundwater	
HS19080285-01	35BWW20-190806	06 Aug 2019 08:05			08 Aug 2019 18:34	1
HS19080285-02	35BWW20-190806-FD	06 Aug 2019 08:05			08 Aug 2019 18:58	1
HS19080285-03	35BWW10-190806	06 Aug 2019 08:55			08 Aug 2019 19:22	1
HS19080285-04	35BWW05-190806	06 Aug 2019 09:40			08 Aug 2019 19:46	1
HS19080285-05	35BWW26-190806	06 Aug 2019 10:25			08 Aug 2019 20:10	1
HS19080285-06	35BWW14-190806	06 Aug 2019 11:25			08 Aug 2019 20:34	1
HS19080285-07	35BWW23-190806	06 Aug 2019 12:20			08 Aug 2019 20:58	1
HS19080285-08	35BWW13-190806	06 Aug 2019 13:10			08 Aug 2019 21:22	1
HS19080285-09	Trip Blank	06 Aug 2019 00:00			08 Aug 2019 17:46	1
Batch ID: R344592 (0)		Test Name : SUBCONTRACT ANALYSIS - RSK			Matrix: Groundwater	
HS19080285-05	35BWW26-190806	06 Aug 2019 10:25			20 Aug 2019 14:27	1
HS19080285-06	35BWW14-190806	06 Aug 2019 11:25			20 Aug 2019 14:27	1
HS19080285-07	35BWW23-190806	06 Aug 2019 12:20			20 Aug 2019 14:27	1
Batch ID: R344639 (0)		Test Name : SUBCONTRACT ANALYSIS - TOC ANALYSIS			Matrix: Groundwater	
HS19080285-05	35BWW26-190806	06 Aug 2019 10:25			21 Aug 2019 09:17	1
HS19080285-06	35BWW14-190806	06 Aug 2019 11:25			21 Aug 2019 09:17	1
HS19080285-07	35BWW23-190806	06 Aug 2019 12:20			21 Aug 2019 09:17	1

ALS Houston, US

Date: 21-Aug-19

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant - LHAAP-37
WorkOrder: HS19080285

QC BATCH REPORT

Batch ID: R343919 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MBLK	Sample ID: VBLKW-190808	Units: UG/L			Analysis Date: 08-Aug-2019 12:33					
Client ID:	Run ID: VOA6_343919	SeqNo: 5202079	PrepDate:	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromomethane	0.50	1.0								U
Carbon disulfide	1.0	2.0								U
Carbon tetrachloride	0.50	1.0								U
Chlorobenzene	0.50	1.0								U
Chloroethane	0.50	1.0								U
Chloroform	0.50	1.0								U
Chloromethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
cis-1,3-Dichloropropene	0.50	1.0								U
Dibromochloromethane	0.50	1.0								U
Dibromomethane	0.50	1.0								U
Dichlorodifluoromethane	0.50	1.0								U
Ethylbenzene	0.50	1.0								U
Hexachlorobutadiene	1.0	1.0								U
Isopropylbenzene	0.50	1.0								U
m,p-Xylene	1.0	2.0								U
Methylene chloride	1.0	2.0								U
Naphthalene	0.50	1.0								U
n-Butylbenzene	0.50	1.0								U
n-Propylbenzene	0.50	1.0								U
o-Xylene	0.50	1.0								U
sec-Butylbenzene	0.50	1.0								U
Styrene	0.50	1.0								U
tert-Butylbenzene	0.50	1.0								U
Tetrachloroethene	0.50	1.0								U
Toluene	0.50	1.0								U
trans-1,2-Dichloroethene	0.50	1.0								U
trans-1,3-Dichloropropene	0.50	1.0								U
Trichloroethene	0.50	1.0								U
Trichlorofluoromethane	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>44.02</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>88.0</i>	<i>81 - 118</i>				
<i>Surr: 4-Bromofluorobenzene</i>	<i>48.67</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>97.3</i>	<i>85 - 114</i>				
<i>Surr: Dibromofluoromethane</i>	<i>45.44</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>90.9</i>	<i>80 - 119</i>				

ALS Houston, US

Date: 21-Aug-19

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant - LHAAP-37
WorkOrder: HS19080285

QC BATCH REPORT

Batch ID: R343919 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MBLK	Sample ID: VBLKW-190808	Units: UG/L			Analysis Date: 08-Aug-2019 12:33					
Client ID:	Run ID: VOA6_343919	SeqNo: 5202079		PrepDate:		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
<i>Surr: Toluene-d8</i>	52.14	1.0	50	0	104	89 - 112				

ALS Houston, US

Date: 21-Aug-19

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant - LHAAP-37
WorkOrder: HS19080285

QC BATCH REPORT

Batch ID: R343919 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
LCS	Sample ID: VLCSW-190808	Units: UG/L			Analysis Date: 08-Aug-2019 11:45					
Client ID:	Run ID: VOA6_343919	SeqNo: 5202078		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	19.46	1.0	20	0	97.3	78 - 124				
1,1,1-Trichloroethane	19	1.0	20	0	95.0	74 - 131				
1,1,2,2-Tetrachloroethane	19.97	1.0	20	0	99.9	71 - 121				
1,1,2-Trichlor-1,2,2-trifluoroethane	19.04	1.0	20	0	95.2	70 - 136				
1,1,2-Trichloroethane	19.49	1.0	20	0	97.4	80 - 119				
1,1-Dichloroethane	19.31	1.0	20	0	96.5	77 - 125				
1,1-Dichloroethene	19.08	1.0	20	0	95.4	71 - 131				
1,1-Dichloropropene	18.39	1.0	20	0	91.9	78 - 125				
1,2,3-Trichlorobenzene	22.55	1.0	20	0	113	69 - 129				
1,2,3-Trichloropropane	19.42	1.0	20	0	97.1	73 - 122				
1,2,4-Trichlorobenzene	20.73	1.0	20	0	104	69 - 130				
1,2,4-Trimethylbenzene	18.32	1.0	20	0	91.6	76 - 124				
1,2-Dibromo-3-chloropropane	19.4	1.0	20	0	97.0	62 - 128				
1,2-Dibromoethane	19.5	1.0	20	0	97.5	77 - 121				
1,2-Dichlorobenzene	19.85	1.0	20	0	99.3	80 - 119				
1,2-Dichloroethane	19.01	1.0	20	0	95.1	73 - 128				
1,2-Dichloropropane	20.24	1.0	20	0	101	78 - 122				
1,3,5-Trimethylbenzene	18.06	1.0	20	0	90.3	75 - 124				
1,3-Dichlorobenzene	18.34	1.0	20	0	91.7	80 - 119				
1,3-Dichloropropane	19.17	1.0	20	0	95.9	80 - 119				
1,4-Dichlorobenzene	19.64	1.0	20	0	98.2	79 - 118				
2,2-Dichloropropane	19.78	1.0	20	0	98.9	60 - 139				
2-Butanone	36.3	2.0	40	0	90.8	56 - 143				
2-Chlorotoluene	18.19	1.0	20	0	90.9	79 - 122				
2-Hexanone	38.67	2.0	40	0	96.7	57 - 139				
4-Chlorotoluene	18.25	1.0	20	0	91.3	78 - 122				
4-Isopropyltoluene	17.67	1.0	20	0	88.4	77 - 127				
4-Methyl-2-pentanone	37.92	2.0	40	0	94.8	67 - 130				
Acetone	35.01	2.0	40	0	87.5	39 - 160				
Benzene	19.48	1.0	20	0	97.4	79 - 120				
Bromobenzene	18.64	1.0	20	0	93.2	80 - 120				
Bromochloromethane	18.75	1.0	20	0	93.7	78 - 123				
Bromodichloromethane	19.53	1.0	20	0	97.6	79 - 125				
Bromoform	18.98	1.0	20	0	94.9	66 - 130				

ALS Houston, US

Date: 21-Aug-19

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant - LHAAP-37
WorkOrder: HS19080285

QC BATCH REPORT

Batch ID: R343919 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
LCS	Sample ID: VLCSW-190808	Units: UG/L			Analysis Date: 08-Aug-2019 11:45					
Client ID:	Run ID: VOA6_343919	SeqNo: 5202078	PrepDate:	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromomethane	23.64	1.0	20	0	118	53 - 141				
Carbon disulfide	39.13	2.0	40	0	97.8	64 - 133				
Carbon tetrachloride	17.67	1.0	20	0	88.3	72 - 136				
Chlorobenzene	19.12	1.0	20	0	95.6	82 - 118				
Chloroethane	21.88	1.0	20	0	109	60 - 138				
Chloroform	19.29	1.0	20	0	96.4	79 - 124				
Chloromethane	20.58	1.0	20	0	103	50 - 139				
cis-1,2-Dichloroethene	19.38	1.0	20	0	96.9	78 - 123				
cis-1,3-Dichloropropene	19.82	1.0	20	0	99.1	75 - 124				
Dibromochloromethane	19.31	1.0	20	0	96.6	74 - 126				
Dibromomethane	19.52	1.0	20	0	97.6	79 - 123				
Dichlorodifluoromethane	19.1	1.0	20	0	95.5	32 - 152				
Ethylbenzene	18.78	1.0	20	0	93.9	79 - 121				
Hexachlorobutadiene	23.01	1.0	20	0	115	66 - 134				
Isopropylbenzene	18.11	1.0	20	0	90.5	72 - 131				
m,p-Xylene	37.4	2.0	40	0	93.5	80 - 121				
Methylene chloride	20.05	2.0	20	0	100	74 - 124				
Naphthalene	20.16	1.0	20	0	101	61 - 128				
n-Butylbenzene	18.38	1.0	20	0	91.9	75 - 128				
n-Propylbenzene	17.96	1.0	20	0	89.8	76 - 126				
o-Xylene	19.05	1.0	20	0	95.2	78 - 122				
sec-Butylbenzene	17.44	1.0	20	0	87.2	77 - 126				
Styrene	19.41	1.0	20	0	97.0	78 - 123				
tert-Butylbenzene	17.36	1.0	20	0	86.8	78 - 124				
Tetrachloroethene	18.12	1.0	20	0	90.6	74 - 129				
Toluene	19.34	1.0	20	0	96.7	80 - 121				
trans-1,2-Dichloroethene	19.28	1.0	20	0	96.4	75 - 124				
trans-1,3-Dichloropropene	20.09	1.0	20	0	100	73 - 127				
Trichloroethene	19.17	1.0	20	0	95.9	79 - 123				
Trichlorofluoromethane	18.76	1.0	20	0	93.8	65 - 141				
Vinyl chloride	19.75	1.0	20	0	98.8	58 - 137				
Surr: 1,2-Dichloroethane-d4	50.1	1.0	50	0	100	81 - 118				
Surr: 4-Bromofluorobenzene	51.81	1.0	50	0	104	85 - 114				
Surr: Dibromofluoromethane	50.54	1.0	50	0	101	80 - 119				

ALS Houston, US

Date: 21-Aug-19

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant - LHAAP-37
WorkOrder: HS19080285

QC BATCH REPORT

Batch ID: R343919 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
LCS	Sample ID: VLCSW-190808	Units: UG/L			Analysis Date: 08-Aug-2019 11:45					
Client ID:	Run ID: VOA6_343919	SeqNo: 5202078		PrepDate:		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
<i>Surr: Toluene-d8</i>	47.57	1.0	50	0	95.1	89 - 112				

ALS Houston, US

Date: 21-Aug-19

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant - LHAAP-37
WorkOrder: HS19080285

QC BATCH REPORT

Batch ID: R343919 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MS	Sample ID: HS19080238-03MS	Units: UG/L			Analysis Date: 08-Aug-2019 16:34					
Client ID:	Run ID: VOA6_343919	SeqNo: 5202814	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	19.12	1.0	20	0	95.6	78 - 124				
1,1,1-Trichloroethane	18.07	1.0	20	0	90.4	74 - 131				
1,1,2,2-Tetrachloroethane	20.2	1.0	20	0	101	71 - 121				
1,1,2-Trichlor-1,2,2-trifluoroethane	20.28	1.0	20	0	101	70 - 136				
1,1,2-Trichloroethane	19.05	1.0	20	0	95.3	80 - 119				
1,1-Dichloroethane	17.16	1.0	20	0	85.8	77 - 125				
1,1-Dichloroethene	17.72	1.0	20	0	88.6	71 - 131				
1,1-Dichloropropene	18.71	1.0	20	0	93.5	78 - 125				
1,2,3-Trichlorobenzene	20.73	1.0	20	0	104	69 - 129				
1,2,3-Trichloropropane	19.62	1.0	20	0	98.1	73 - 122				
1,2,4-Trichlorobenzene	20.78	1.0	20	0	104	69 - 130				
1,2,4-Trimethylbenzene	20.17	1.0	20	0	101	76 - 124				
1,2-Dibromo-3-chloropropane	20.28	1.0	20	0	101	62 - 128				
1,2-Dibromoethane	18.99	1.0	20	0	95.0	77 - 121				
1,2-Dichlorobenzene	20.54	1.0	20	0	103	80 - 119				
1,2-Dichloroethane	17.64	1.0	20	0	88.2	73 - 128				
1,2-Dichloropropane	18.49	1.0	20	0	92.5	78 - 122				
1,3,5-Trimethylbenzene	20.35	1.0	20	0	102	75 - 124				
1,3-Dichlorobenzene	19.51	1.0	20	0	97.6	80 - 119				
1,3-Dichloropropane	18.76	1.0	20	0	93.8	80 - 119				
1,4-Dichlorobenzene	20.51	1.0	20	0	103	79 - 118				
2,2-Dichloropropane	17.67	1.0	20	0	88.3	60 - 139				
2-Butanone	44.73	2.0	40	0	112	56 - 143				
2-Chlorotoluene	19.71	1.0	20	0	98.6	79 - 122				
2-Hexanone	55.67	2.0	40	0	139	57 - 139				S
4-Chlorotoluene	19.6	1.0	20	0	98.0	78 - 122				
4-Isopropyltoluene	21.03	1.0	20	0	105	77 - 127				
4-Methyl-2-pentanone	54.84	2.0	40	0	137	67 - 130				S
Acetone	35.38	2.0	40	0	88.5	39 - 160				
Benzene	18.45	1.0	20	0	92.3	79 - 120				
Bromobenzene	19.27	1.0	20	0	96.3	80 - 120				
Bromochloromethane	16.53	1.0	20	0	82.7	78 - 123				
Bromodichloromethane	18.03	1.0	20	0	90.2	79 - 125				
Bromoform	18.73	1.0	20	0	93.6	66 - 130				

ALS Houston, US

Date: 21-Aug-19

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant - LHAAP-37
WorkOrder: HS19080285

QC BATCH REPORT

Batch ID: R343919 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MS	Sample ID: HS19080238-03MS	Units: UG/L			Analysis Date: 08-Aug-2019 16:34					
Client ID:	Run ID: VOA6_343919	SeqNo: 5202814	PrepDate:	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromomethane	18.54	1.0	20	0	92.7	53 - 141				
Carbon disulfide	50.78	2.0	40	0	127	64 - 133				
Carbon tetrachloride	18.73	1.0	20	0	93.7	72 - 136				
Chlorobenzene	19.26	1.0	20	0	96.3	82 - 118				
Chloroethane	17.3	1.0	20	0	86.5	60 - 138				
Chloroform	17.31	1.0	20	0	86.6	79 - 124				
Chloromethane	13.09	1.0	20	0	65.4	50 - 139				
cis-1,2-Dichloroethene	17.72	1.0	20	0	88.6	78 - 123				
cis-1,3-Dichloropropene	17.91	1.0	20	0	89.5	75 - 124				
Dibromochloromethane	18.83	1.0	20	0	94.2	74 - 126				
Dibromomethane	17.96	1.0	20	0	89.8	79 - 123				
Dichlorodifluoromethane	10.02	1.0	20	0	50.1	32 - 152				
Ethylbenzene	19.96	1.0	20	0	99.8	79 - 121				
Hexachlorobutadiene	22.87	1.0	20	0	114	66 - 134				
Isopropylbenzene	20.23	1.0	20	0	101	72 - 131				
m,p-Xylene	39.76	2.0	40	0	99.4	80 - 121				
Methylene chloride	17.76	2.0	20	0	88.8	74 - 124				
Naphthalene	19.45	1.0	20	0	97.2	61 - 128				
n-Butylbenzene	21.83	1.0	20	0	109	75 - 128				
n-Propylbenzene	20.86	1.0	20	0	104	76 - 126				
o-Xylene	19.64	1.0	20	0	98.2	78 - 122				
sec-Butylbenzene	21.12	1.0	20	0	106	77 - 126				
Styrene	19.53	1.0	20	0	97.6	78 - 123				
tert-Butylbenzene	20.9	1.0	20	0	105	78 - 124				
Tetrachloroethene	20.31	1.0	20	0	102	74 - 129				
Toluene	19.74	1.0	20	0	98.7	80 - 121				
trans-1,2-Dichloroethene	17.75	1.0	20	0	88.8	75 - 124				
trans-1,3-Dichloropropene	17.6	1.0	20	0	88.0	73 - 127				
Trichloroethene	89.13	1.0	20	70.49	93.2	79 - 123				
Trichlorofluoromethane	17.61	1.0	20	0	88.1	65 - 141				
Vinyl chloride	15.6	1.0	20	0	78.0	58 - 137				
Surr: 1,2-Dichloroethane-d4	45.27	1.0	50	0	90.5	81 - 118				
Surr: 4-Bromofluorobenzene	50.34	1.0	50	0	101	85 - 114				
Surr: Dibromofluoromethane	46.62	1.0	50	0	93.2	80 - 119				

ALS Houston, US

Date: 21-Aug-19

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant - LHAAP-37
WorkOrder: HS19080285

QC BATCH REPORT

Batch ID: R343919 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MS	Sample ID: HS19080238-03MS	Units: UG/L			Analysis Date: 08-Aug-2019 16:34					
Client ID:	Run ID: VOA6_343919	SeqNo: 5202814		PrepDate:		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
<i>Surr: Toluene-d8</i>	49.87	1.0	50	0	99.7	89 - 112				

ALS Houston, US

Date: 21-Aug-19

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant - LHAAP-37
WorkOrder: HS19080285

QC BATCH REPORT

Batch ID: R343919 (0)		Instrument: VOA6			Method: VOLATILES ORGANICS BY METHOD 8260C					
MSD	Sample ID: HS19080238-03MSD	Units: UG/L			Analysis Date: 08-Aug-2019 16:58					
Client ID:	Run ID: VOA6_343919	SeqNo: 5202816		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	18.61	1.0	20	0	93.0	78 - 124	19.12	2.73	20	
1,1,1-Trichloroethane	17.55	1.0	20	0	87.8	74 - 131	18.07	2.95	20	
1,1,2,2-Tetrachloroethane	19.54	1.0	20	0	97.7	71 - 121	20.2	3.28	20	
1,1,2-Trichlor-1,2,2-trifluoroethane	19.17	1.0	20	0	95.9	70 - 136	20.28	5.61	20	
1,1,2-Trichloroethane	18.54	1.0	20	0	92.7	80 - 119	19.05	2.69	20	
1,1-Dichloroethane	16.57	1.0	20	0	82.8	77 - 125	17.16	3.52	20	
1,1-Dichloroethene	16.94	1.0	20	0	84.7	71 - 131	17.72	4.51	20	
1,1-Dichloropropene	17.66	1.0	20	0	88.3	78 - 125	18.71	5.78	20	
1,2,3-Trichlorobenzene	20.69	1.0	20	0	103	69 - 129	20.73	0.198	20	
1,2,3-Trichloropropane	19.36	1.0	20	0	96.8	73 - 122	19.62	1.33	20	
1,2,4-Trichlorobenzene	20.25	1.0	20	0	101	69 - 130	20.78	2.59	20	
1,2,4-Trimethylbenzene	18.79	1.0	20	0	93.9	76 - 124	20.17	7.08	20	
1,2-Dibromo-3-chloropropane	19.23	1.0	20	0	96.1	62 - 128	20.28	5.33	20	
1,2-Dibromoethane	18.76	1.0	20	0	93.8	77 - 121	18.99	1.26	20	
1,2-Dichlorobenzene	19.39	1.0	20	0	96.9	80 - 119	20.54	5.75	20	
1,2-Dichloroethane	17.4	1.0	20	0	87.0	73 - 128	17.64	1.37	20	
1,2-Dichloropropane	18.09	1.0	20	0	90.4	78 - 122	18.49	2.22	20	
1,3,5-Trimethylbenzene	18.91	1.0	20	0	94.6	75 - 124	20.35	7.31	20	
1,3-Dichlorobenzene	18.3	1.0	20	0	91.5	80 - 119	19.51	6.43	20	
1,3-Dichloropropane	18.31	1.0	20	0	91.6	80 - 119	18.76	2.41	20	
1,4-Dichlorobenzene	19.38	1.0	20	0	96.9	79 - 118	20.51	5.64	20	
2,2-Dichloropropane	16.68	1.0	20	0	83.4	60 - 139	17.67	5.76	20	
2-Butanone	46.67	2.0	40	0	117	56 - 143	44.73	4.25	20	
2-Chlorotoluene	18.5	1.0	20	0	92.5	79 - 122	19.71	6.33	20	
2-Hexanone	55.97	2.0	40	0	140	57 - 139	55.67	0.539	20	S
4-Chlorotoluene	18.37	1.0	20	0	91.8	78 - 122	19.6	6.5	20	
4-Isopropyltoluene	19.63	1.0	20	0	98.1	77 - 127	21.03	6.88	20	
4-Methyl-2-pentanone	54.84	2.0	40	0	137	67 - 130	54.84	0	20	S
Acetone	36.24	2.0	40	0	90.6	39 - 160	35.38	2.38	20	
Benzene	17.83	1.0	20	0	89.2	79 - 120	18.45	3.42	20	
Bromobenzene	17.8	1.0	20	0	89.0	80 - 120	19.27	7.93	20	
Bromochloromethane	16.23	1.0	20	0	81.1	78 - 123	16.53	1.86	20	
Bromodichloromethane	17.52	1.0	20	0	87.6	79 - 125	18.03	2.89	20	
Bromoform	18.11	1.0	20	0	90.6	66 - 130	18.73	3.35	20	

ALS Houston, US

Date: 21-Aug-19

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant - LHAAP-37
WorkOrder: HS19080285

QC BATCH REPORT

Batch ID: R343919 (0)		Instrument: VOA6			Method: VOLATILES ORGANICS BY METHOD 8260C					
MSD	Sample ID: HS19080238-03MSD	Units: UG/L			Analysis Date: 08-Aug-2019 16:58					
Client ID:	Run ID: VOA6_343919	SeqNo: 5202816		PrepDate:		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromomethane	16.98	1.0	20	0	84.9	53 - 141	18.54	8.78	20	
Carbon disulfide	48.14	2.0	40	0	120	64 - 133	50.78	5.35	20	
Carbon tetrachloride	17.91	1.0	20	0	89.5	72 - 136	18.73	4.52	20	
Chlorobenzene	18.44	1.0	20	0	92.2	82 - 118	19.26	4.33	20	
Chloroethane	16.02	1.0	20	0	80.1	60 - 138	17.3	7.65	20	
Chloroform	16.81	1.0	20	0	84.0	79 - 124	17.31	2.95	20	
Chloromethane	12.44	1.0	20	0	62.2	50 - 139	13.09	5.1	20	
cis-1,2-Dichloroethene	17.22	1.0	20	0	86.1	78 - 123	17.72	2.88	20	
cis-1,3-Dichloropropene	17.82	1.0	20	0	89.1	75 - 124	17.91	0.483	20	
Dibromochloromethane	18.19	1.0	20	0	91.0	74 - 126	18.83	3.45	20	
Dibromomethane	17.72	1.0	20	0	88.6	79 - 123	17.96	1.35	20	
Dichlorodifluoromethane	9.356	1.0	20	0	46.8	32 - 152	10.02	6.82	20	
Ethylbenzene	18.89	1.0	20	0	94.5	79 - 121	19.96	5.52	20	
Hexachlorobutadiene	22.07	1.0	20	0	110	66 - 134	22.87	3.56	20	
Isopropylbenzene	19.27	1.0	20	0	96.4	72 - 131	20.23	4.84	20	
m,p-Xylene	37.68	2.0	40	0	94.2	80 - 121	39.76	5.38	20	
Methylene chloride	17.27	2.0	20	0	86.3	74 - 124	17.76	2.79	20	
Naphthalene	19.44	1.0	20	0	97.2	61 - 128	19.45	0.0134	20	
n-Butylbenzene	20.28	1.0	20	0	101	75 - 128	21.83	7.33	20	
n-Propylbenzene	19.28	1.0	20	0	96.4	76 - 126	20.86	7.9	20	
o-Xylene	18.76	1.0	20	0	93.8	78 - 122	19.64	4.59	20	
sec-Butylbenzene	19.88	1.0	20	0	99.4	77 - 126	21.12	6.07	20	
Styrene	18.9	1.0	20	0	94.5	78 - 123	19.53	3.25	20	
tert-Butylbenzene	19.4	1.0	20	0	97.0	78 - 124	20.9	7.43	20	
Tetrachloroethene	18.93	1.0	20	0	94.6	74 - 129	20.31	7.02	20	
Toluene	18.71	1.0	20	0	93.5	80 - 121	19.74	5.38	20	
trans-1,2-Dichloroethene	16.96	1.0	20	0	84.8	75 - 124	17.75	4.55	20	
trans-1,3-Dichloropropene	17.52	1.0	20	0	87.6	73 - 127	17.6	0.401	20	
Trichloroethene	85.3	1.0	20	70.49	74.0	79 - 123	89.13	4.4	20	S
Trichlorofluoromethane	16.5	1.0	20	0	82.5	65 - 141	17.61	6.51	20	
Vinyl chloride	14.25	1.0	20	0	71.2	58 - 137	15.6	9.08	20	
Surr: 1,2-Dichloroethane-d4	45.05	1.0	50	0	90.1	81 - 118	45.27	0.482	20	
Surr: 4-Bromofluorobenzene	51.13	1.0	50	0	102	85 - 114	50.34	1.55	20	
Surr: Dibromofluoromethane	46.54	1.0	50	0	93.1	80 - 119	46.62	0.158	20	

ALS Houston, US

Date: 21-Aug-19

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant - LHAAP-37
WorkOrder: HS19080285

QC BATCH REPORT

Batch ID: R343851 (0)		Instrument: ICS2100		Method: ANIONS BY SW9056A						
MBLK	Sample ID: WBLKW1-080719	Units: mg/L			Analysis Date: 07-Aug-2019 15:21					
Client ID:	Run ID: ICS2100_343851	SeqNo: 5200729		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: WLCSW1-080719	Units: mg/L			Analysis Date: 07-Aug-2019 15:36					
Client ID:	Run ID: ICS2100_343851	SeqNo: 5200730		PrepDate:			DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
Chloride	18.76	0.500	20	0	93.8	80 - 120				
Nitrogen, Nitrate (As N)	3.723	0.100	4	0	93.1	80 - 120				
Sulfate	18.62	0.500	20	0	93.1	80 - 120				
LCS D	Sample ID: WLCSDW1-080719	Units: mg/L			Analysis Date: 07-Aug-2019 15:50					
Client ID:	Run ID: ICS2100_343851	SeqNo: 5200731		PrepDate:			DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
Chloride	19.59	0.500	20	0	97.9	80 - 120	18.76	4.33	20	
Nitrogen, Nitrate (As N)	3.885	0.100	4	0	97.1	80 - 120	3.723	4.26	20	
Sulfate	19.45	0.500	20	0	97.2	80 - 120	18.62	4.36	20	
MS	Sample ID: HS19080011-14MS	Units: mg/L			Analysis Date: 07-Aug-2019 17:52					
Client ID:	Run ID: ICS2100_343851	SeqNo: 5200737		PrepDate:			DF: 50			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
Chloride	1558	25.0	500	1044	103	80 - 120				
Nitrogen, Nitrate (As N)	105.2	5.00	100	9.685	95.5	80 - 120				
Sulfate	1357	25.0	500	839.7	103	80 - 120				

ALS Houston, US

Date: 21-Aug-19

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant - LHAAP-37
WorkOrder: HS19080285

QC BATCH REPORT

Batch ID: R343851 (0)		Instrument: ICS2100		Method: ANIONS BY SW9056A						
MSD	Sample ID: HS19080011-14MSD	Units: mg/L			Analysis Date: 07-Aug-2019 18:06					
Client ID:	Run ID: ICS2100_343851	SeqNo: 5200738		PrepDate:		DF: 50				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
Chloride	1454	25.0	500	1044	81.9	80 - 120	1558	6.88	20	
Nitrogen, Nitrate (As N)	97.98	5.00	100	9.685	88.3	80 - 120	105.2	7.05	20	
Sulfate	1273	25.0	500	839.7	86.6	80 - 120	1357	6.39	20	
The following samples were analyzed in this batch:										
HS19080285-05 HS19080285-06 HS19080285-07										

ALS Houston, US

Date: 21-Aug-19

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant - LHAAP-37
WorkOrder: **HS19080285**

**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 Quantitation Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	19-028-0	27-Mar-2020
California	2919, 2019-2020	30-Apr-2020
Dept of Defense	ANAB L2231	20-Dec-2021
Kansas	E-10352 2019-2020	31-Jul-2020
Kentucky	123043, 2019-2020	30-Apr-2020
Louisiana	03087, 2019-2020	30-Jun-2020
Maryland	343, 2019-2020	30-Jun-2020
North Carolina	624-2019	31-Dec-2019
Oklahoma	2018-156	31-Aug-2019
Texas	TX104704231-19-23	30-Apr-2020

ALS Houston, US

Date: 21-ago-19

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant - LHAAP-37
Work Order: HS19080285

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS19080285-01	35BWW20-190806	Login	07/08/2019 11:03:48	JRM	VOA090
HS19080285-02	35BWW20-190806-FD	Login	07/08/2019 11:03:48	JRM	VOA090
HS19080285-03	35BWW10-190806	Login	07/08/2019 11:03:48	JRM	VOA090
HS19080285-04	35BWW05-190806	Login	07/08/2019 11:03:48	JRM	VOA090
HS19080285-05	35BWW26-190806	Login	07/08/2019 11:03:48	JRM	WET204
HS19080285-05	35BWW26-190806	Login	07/08/2019 11:03:48	JRM	VOA090
HS19080285-05	35BWW26-190806	Login	07/08/2019 11:03:48	JRM	Sub
HS19080285-05	35BWW26-190806	Login	07/08/2019 11:03:48	JRM	Sub
HS19080285-06	35BWW14-190806	Login	07/08/2019 11:03:48	JRM	WET204
HS19080285-06	35BWW14-190806	Login	07/08/2019 11:03:48	JRM	VOA090
HS19080285-06	35BWW14-190806	Login	07/08/2019 11:03:48	JRM	Sub
HS19080285-06	35BWW14-190806	Login	07/08/2019 11:03:48	JRM	Sub
HS19080285-07	35BWW23-190806	Login	07/08/2019 11:03:48	JRM	WET204
HS19080285-07	35BWW23-190806	Login	07/08/2019 11:03:48	JRM	VOA090
HS19080285-07	35BWW23-190806	Login	07/08/2019 11:03:48	JRM	Sub
HS19080285-07	35BWW23-190806	Login	07/08/2019 11:03:48	JRM	Sub
HS19080285-08	35BWW13-190806	Login	07/08/2019 11:03:48	JRM	WET204
HS19080285-08	35BWW13-190806	Login	07/08/2019 11:03:48	JRM	VOA090
HS19080285-08	35BWW13-190806	Login	07/08/2019 11:03:48	JRM	Sub
HS19080285-08	35BWW13-190806	Login	07/08/2019 11:03:48	JRM	Sub
HS19080285-09	Trip Blank	Login	07/08/2019 11:03:48	JRM	VOA090

Sample Receipt Checklist

Client Name: CBI-Houston
 Work Order: HS19080285

Date/Time Received: **07-Aug-2019 08:50**
 Received by: **JRM**

Checklist completed by: Jared R. Makan 7-Aug-2019
 eSignature Date

Reviewed by: RJ Modashia 7-Aug-2019
 eSignature Date

Matrices: **Water**

Carrier name: **ALS Courier**

- Shipping container/cooler in good condition? Yes No Not Present
- Custody seals intact on shipping container/cooler? Yes No Not Present
- Custody seals intact on sample bottles? Yes No Not Present
- 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 COC IDs:N/A
- 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/0.8c UC/C IR25
 Cooler(s)/Kit(s): 43924
 Date/Time sample(s) sent to storage: 08/07/2019 11:30

- 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:

APTIM		Page 1 of												
COC ID: LHAAP37-AUG2019-ALS		TURNAROUND TIME:				RUSH:								
PROJECT/CLIENT INFO					LABORATORY					OTHER INFO				
Facility Name: Longhorn AAP					Lab Name: ALS Laboratories					Email Invoice To: FedInvoices@aptim.com				
Project Number: 591032					Lab Contact: RJ Madashia									
Address: LHAAP-37					Email: RJ.Madashia@alsglobal.com					Email Report To: Susan.Huang@aptim.com				
1203-B East Grand Avenue					Address: 10450 Stancliff Rd., Suite 210					Mail Reports To: Susan Huang				
PMB 202										Address: 4005 Port Chicago Highway, Suite 200				
City: Marshall			State: TX		City: Houston			State: TX		City: Concord				
Postal Code: 75670			Country: USA		Postal Code: 77099			Country: USA		Postal Code: 94520				
Phone Number: 713.243.7264					Phone Number: 281.575.2279 or 281.530.5656					Shipping Company:				
Project Manager: Praveen Srivastav														
SAMPLE DETAILS								ANALYSIS REQUESTED						
Sample ID	Location	Start Depth	End Depth	Depth Unit	Field Matrix	Date	Time (24hr)	# Of Cont.	Sample Container and Preservatives	3-40 ml VOA/ICL	3-40 ml VOA/ICL	3-40 ml VOA/Cool to 6 deg C	2-40ml Amber/H2SO4	1-250ml /Cool to 6 deg C
									ANALYSIS	Yes by 8260B	MEE by RSK175	CO2 by RSK175	TOC by Sms310C	Anions (chloride/sulfate/nitrate) by 9056
35Bww20-190806	LHAAP37	23.67	23.92		WG	8/6/19	0805	3		X				
35Bww20-190806-#D	LHAAP37	23.67	23.92		WG	8/6/19	0805	3		X				
35Bww10-190806	LHAAP37	22.68	22.92		WG	8/6/19	0855	3		X				
35Bww05-190806	LHAAP37	21.83	22.05		WG	8/6/19	0940	3		X				
35Bww26-190806	LHAAP37	25.60	25.83		WG	8/6/19	1025	12		X	X	X	X	X
35Bww14-190806	LHAAP37	20.57	20.83		WG	8/6/19	1125	12		X	X	X	X	X
35Bww23-190806	LHAAP37	26.49	26.73		WG	8/6/19	1220	12		X	X	X	X	X
35Bww13-190806	LHAAP37	22.02	22.23		WG	8/6/19	1310	3		X				
TRIP BLANK	LHAAP37				W	8/6/19		2		X				

HS19080285

Aptim Environmental & Infrastructure, Inc.
Longhorn Army Ammunition Plant - LHAAP-37



ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
	Santa Benigno / BHATG	8/6/19 1430	JM	8/11/19 08:50

43924
0.80
+25
clif. o. co.

ALS
 10450 Standliff Rd., Suite 210
 Houston, Texas 77099
 Tel. +1 281 530 5556
 Fax. +1 281 530 5887

Date: 8
 Name:
 Company:

43924

CUSTODY SEAL

Seal Broken By:
 Date:


6/19 Time: 4:30
 Suit B...
 S-HART

Seal Broken By:
 Date:

FedEx
 TRK# 4809 7836 1776

SECURITY OVERNIGHT
WED - 07 AUG 10:30A
PRIORITY OVERNIGHT

AB SGRA 43924 77099
 TX-US
 IAH



1 01 162785 06AUG19 06EA 56BC2/1551/0CBA



ALS Environmental
ALS Group USA, Corp
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Kelso, WA 98626
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August 20, 2019

Analytical Report for Service Request No: K1907274

RJ Modashia
ALS Laboratory Group
10450 Stancliff Road
Suite 210
Houston, TX 77099-4338

RE: HS19080285

Dear RJ,

Enclosed are the results of the sample(s) submitted to our laboratory August 08, 2019
For your reference, these analyses have been assigned our service request number **K1907274**.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. All results are intended to be considered in their entirety, and ALS Group USA Corp. dba ALS Environmental (ALS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please contact me if you have any questions. My extension is 3350. You may also contact me via email at Kelley.Lovejoy@alsglobal.com.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

for Kelley Lovejoy
Project Manager



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Table of Contents

Acronyms

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 General Chemistry

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LOD	Limit of Detection
LOQ	Limit of Quantitation
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

Inorganic Data Qualifiers

- * The result is an outlier. See case narrative.
- # The control limit criteria is not applicable. See case narrative.
- B The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
- E The result is an estimate amount because the value exceeded the instrument calibration range.
- J The result is an estimated value.
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
DOD-QSM 4.2 definition : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- i The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
- X See case narrative.
- Q See case narrative. One or more quality control criteria was outside the limits.
- H The holding time for this test is immediately following sample collection. The samples were analyzed as soon as possible after receipt by the laboratory.

Metals Data Qualifiers

- # The control limit criteria is not applicable. See case narrative.
- J The result is an estimated value.
- E The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
- M The duplicate injection precision was not met.
- N The Matrix Spike sample recovery is not within control limits. See case narrative.
- S The reported value was determined by the Method of Standard Additions (MSA).
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
DOD-QSM 4.2 definition : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- W The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
- i The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
- X See case narrative.
- + The correlation coefficient for the MSA is less than 0.995.
- Q See case narrative. One or more quality control criteria was outside the limits.

Organic Data Qualifiers

- * The result is an outlier. See case narrative.
- # The control limit criteria is not applicable. See case narrative.
- A A tentatively identified compound, a suspected aldol-condensation product.
- B The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
- C The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
- D The reported result is from a dilution.
- E The result is an estimated value.
- J The result is an estimated value.
- N The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
- P The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results.
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
DOD-QSM 4.2 definition : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- i The MRL/MDL or LOQ/LOD is elevated due to a chromatographic interference.
- X See case narrative.
- Q See case narrative. One or more quality control criteria was outside the limits.

Additional Petroleum Hydrocarbon Specific Qualifiers

- F The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
- L The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
- H The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
- O The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
- Y The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
- Z The chromatographic fingerprint does not resemble a petroleum product.

**ALS Group USA Corp. dba ALS Environmental (ALS) - Kelso
State Certifications, Accreditations, and Licenses**

Agency	Web Site	Number
Alaska DEH	http://dec.alaska.gov/eh/lab/cs/csapproval.htm	UST-040
Arizona DHS	http://www.azdhs.gov/lab/license/env.htm	AZ0339
Arkansas - DEQ	http://www.adeq.state.ar.us/techsvs/labcert.htm	88-0637
California DHS (ELAP)	http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx	2795
DOD ELAP	http://www.denix.osd.mil/edqw/Accreditation/AccreditedLabs.cfm	L16-58-R4
Florida DOH	http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm	E87412
Hawaii DOH	http://health.hawaii.gov/	-
ISO 17025	http://www.pjllabs.com/	L16-57
Louisiana DEQ	http://www.deq.louisiana.gov/page/la-lab-accreditation	03016
Maine DHS	http://www.maine.gov/dhhs/	WA01276
Minnesota DOH	http://www.health.state.mn.us/accreditation	053-999-457
Nevada DEP	http://ndep.nv.gov/bsdw/labservice.htm	WA01276
New Jersey DEP	http://www.nj.gov/dep/enforcement/oqa.html	WA005
New York - DOH	https://www.wadsworth.org/regulatory/elap	12060
North Carolina DEQ	https://deq.nc.gov/about/divisions/water-resources/water-resources-data/water-sciences-home-page/laboratory-certification-branch/non-field-lab-certification	605
Oklahoma DEQ	http://www.deq.state.ok.us/CSDnew/labcert.htm	9801
Oregon – DEQ (NELAP)	http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	WA100010
South Carolina DHEC	http://www.scdhec.gov/environment/EnvironmentalLabCertification/	61002
Texas CEQ	http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html	T104704427
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C544
Wyoming (EPA Region 8)	https://www.epa.gov/region8-waterops/epa-region-8-certified-drinking-water	-
Kelso Laboratory Website	www.alsglobal.com	NA

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. A complete listing of specific NELAP-certified analytes, can be found in the certification section at www.ALSGlobal.com or at the accreditation bodies web site.

Please refer to the certification and/or accreditation body's web site if samples are submitted for compliance purposes. The states highlighted above, require the analysis be listed on the state certification if used for compliance purposes and if the method/analyte is offered by that state.



Case Narrative

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577- 7222 Fax (360)636-1 068
www.alsglobal.com



Client: ALS Environmental - US
Project: HS19080285
Sample Matrix: Ground Water

Service Request: K1907274
Date Received: 08/08/2019

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 level IV requested by the client.

Sample Receipt:

Three ground water samples were received for analysis at ALS Environmental on 08/08/2019. 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.

General Chemistry:

No significant anomalies were noted with this analysis.

Approved by Noel D. O'Connell

Date 08/20/2019



Chain of Custody

ALS Environmental—Kelso Laboratory
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Subcontract Chain of Custody

11907274

SAMPLING STATE: Texas

COC ID: 11931

SUBCONTRACT TO:

ALS Environmental Kelso
 1317 S. 13th Avenue
 Kelso, WA 98626

Phone: +1 360 501 3312

CUSTOMER INFORMATION:

Company: ALS Houston
Contact: RJ Modashia
Address: 10450 Stancliff Rd, Ste 210
Phone: +1 281 530 5656
Email: RJ.Modashia@alsglobal.com
Alternate Contact: Jumoke M. Lawal
Email: jumoke.lawal@alsglobal.com

INVOICE INFORMATION:

Company: ALS Houston
Contact: Accounts Payable
Address: 10450 Stancliff Rd, Ste 210
Phone: +1 281 530 5656
Reference: HS19080285
TSR: Sonia West

LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
ANALYSIS REQUESTED			DUE DATE
1. HS19080285-05	35BWW26-190806	Groundwater	06 Aug 2019 10:25
	TOC Analysis with DOD Level IV/EQuIS APTIM EDD		21 Aug 2019
2. HS19080285-06	35BWW14-190806	Groundwater	06 Aug 2019 11:25
	TOC Analysis with DOD Level IV/EQuIS APTIM EDD		21 Aug 2019
3. HS19080285-07	35BWW23-190806	Groundwater	06 Aug 2019 12:20
	TOC Analysis with DOD Level IV/EQuIS APTIM EDD		21 Aug 2019

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

QC Level: DOD IV (DoD Data Package)

Relinquished By: *J. [Signature]*
 Received By: *[Signature]*
 Cooler ID(s): _____

Date/Time: *8/7/19 18:00*
 Date/Time: *8/8/19 1030*
 Temperature(s): _____

RIGHT SOLUTIONS | RIGHT PARTNER



PC _____

Cooler Receipt and Preservation Form

Client ALS Houston Service Request K19 07274

Received: 8/8/19 Opened: 8/8/19 By: UU Unloaded: 8/8/19 By: UU

- Samples were received via? USPS Fed Ex UPS DHL PDX Courier Hand Delivered
- Samples were received in: (circle) Cooler Box Envelope Other _____ NA
- Were custody seals on coolers? NA Y N If yes, how many and where? 2 front
 If present, were custody seals intact? Y N If present, were they signed and dated? Y N

Raw Cooler Temp	Corrected Cooler Temp	Raw Temp Blank	Corrected Temp Blank	Corr. Factor	Thermometer ID	Cooler/COC ID NA	Tracking Number NA	Filed
-0.4	-0.2	0.8	1.0	+0.2	385	11931	4809 7836 5705	

- Packing material: Inserts Baggies Bubble Wrap Gel Packs Wet Ice Dry Ice Sleeves _____
- Were custody papers properly filled out (ink, signed, etc.)? NA Y N
- Were samples received in good condition (temperature, unbroken)? *Indicate in the table below.* NA Y N
 If applicable, tissue samples were received: Frozen Partially Thawed Thawed
- Were all sample labels complete (i.e analysis, preservation, etc.)? NA Y N
- Did all sample labels and tags agree with custody papers? *Indicate major discrepancies in the table on page 2.* NA Y N
- Were appropriate bottles/containers and volumes received for the tests indicated? NA Y N
- Were the pH-preserved bottles (*see SMO GEN SOP*) received at the appropriate pH? *Indicate in the table below* NA Y N
- Were VOA vials received without headspace? *Indicate in the table below.* NA Y N
- Was CI2/Res negative? NA Y N

Sample ID on Bottle	Sample ID on COC	Identified by:

Sample ID	Bottle Count	Out of	Head-	Broke	pH	Reagent	Volume	Reagent Lot	Initials	Time
	Bottle Type	Temp	space				added	Number		

Notes, Discrepancies, & Resolutions:



General Chemistry

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577- 7222 Fax (360)636-1 068
www.alsglobal.com

Analytical Report

Client: ALS Environmental - US
Project: HS19080285
Sample Matrix: Ground Water
Analysis Method: SM 5310 C
Prep Method: None

Service Request: K1907274
Date Collected: 08/6/19
Date Received: 08/8/19
Units: mg/L
Basis: NA

Carbon, Total Organic

Sample Name	Lab Code	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
35BWW26-190806	K1907274-001	0.56	0.50	0.20	0.07	1	08/14/19 13:27	
35BWW14-190806	K1907274-002	0.93	0.50	0.20	0.07	1	08/14/19 13:55	
35BWW23-190806	K1907274-003	0.94	0.50	0.20	0.07	1	08/14/19 14:23	
Method Blank	K1907274-MB	ND U	0.50	0.20	0.07	1	08/14/19 12:01	

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: HS19080285
Sample Matrix: Ground Water
Analysis Method: SM 5310 C
Prep Method: None

Service Request: K1907274
Date Collected: 08/06/19
Date Received: 08/08/19

Units: mg/L
Basis: NA

Replicate Sample Summary
Carbon, Total Organic

Sample Name:	Lab Code:	LOQ	LOD	MDL	Sample Result	Duplicate Result	Average	RPD	RPD Limit	Date Analyzed
35BWW26-190806	K1907274-001DUP	0.50	0.20	0.07	0.56	0.51	0.534	9	10	08/14/19
35BWW14-190806	K1907274-002DUP	0.50	0.20	0.07	0.93	0.94	0.937	1	10	08/14/19
35BWW23-190806	K1907274-003DUP	0.50	0.20	0.07	0.94	1.01	0.973	7	10	08/14/19

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: HS19080285
Sample Matrix: Ground Water

Service Request: K1907274
Date Analyzed: 08/14/19
Date Extracted: NA

Lab Control Sample Summary
Carbon, Total Organic

Analysis Method: SM 5310 C
Prep Method: None

Units: mg/L
Basis: NA
Analysis Lot: 647136

Sample Name	Lab Code	Result	Spike Amount	% Rec	% Rec Limits
Lab Control Sample	K1907274-LCS	24.3	25.0	97	83-117

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: HS19080285

Service Request: K1907274

Continuing Calibration Verification (CCV) Summary

Carbon, Total Organic

Analysis Method: SM 5310 C

Units: mg/L

	Analysis		Date	True	Measured	Percent	Acceptance
	Lot	Lab Code	Analyzed	Value	Value	Recovery	Limits
CCV1	647136	KQ1911607-03	08/14/19 04:17	25.0	23.9	96	90-110
CCV2	647136	KQ1911607-04	08/14/19 11:32	25.0	23.9	95	90-110
CCV3	647136	KQ1911607-05	08/14/19 16:15	25.0	23.6	94	90-110
CCV4	647136	KQ1911607-06	08/14/19 20:59	25.0	24.4	97	90-110

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: HS19080285

Service Request: K1907274

Continuing Calibration Blank (CCB) Summary
Carbon, Total Organic

Analysis Method: SM 5310 C

Units: mg/L

	Analysis Lot	Lab Code	Date Analyzed	LOQ	LOD	MDL	Result	Q
CCB1	647136	KQ1911607-07	08/14/19 04:32	0.50	0.20	0.07	ND	U
CCB2	647136	KQ1911607-08	08/14/19 11:47	0.50	0.20	0.07	ND	U
CCB3	647136	KQ1911607-09	08/14/19 16:30	0.50	0.20	0.07	ND	U
CCB4	647136	KQ1911607-10	08/14/19 21:13	0.50	0.20	0.07	ND	U



Raw Data

ALS Environmental—Kelso Laboratory
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General Chemistry

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Work Request # ^{Original} () T1901331, K1907145, 7144, 7284, 7166, 7235, 7274,
 Tier: IV IV IV IV I IV IV
 Date Analyzed: 8/15/19 ^{7276, 7382, 7383}
 Analyst: HLM CES for BCD DOC: 647138
 Analysis: DOC/TOC Run # 647137
 TOC: 647135
647136

**DATA QUALITY REPORT
 INORGANICS**

Explain any "no" responses to questions below, and any corrective actions in the comments section below.

1. Is the method name and number correct and appropriate? yes/no/NA
2. Holding times met for all analyses and for all samples? yes/no/NA
3. Are calculations correct? yes/no/NA
4. Is the reporting basis correct? (Dry Weight) yes/no/NA
5. All quality control criteria met? yes/no
6. Is the calibration curve correlation coefficient ≥ 0.995 ? yes/no/NA
7. MBs, CCVs, CCBs, LCSs, Dups, and Spikes, analyzed at proper frequency? yes/no/NA
8. Are ICVs, CCVs, and CCBs all within acceptance limits? yes/no/NA
9. Are results for methods blanks all ND? yes/no/NA
10. Are all QC samples within acceptance criteria? (LCS % rec, MS/DMS % rec, DUP or MS/DMS RPDs, etc.) yes/no/NA
11. Are all exceptions explained? yes/no/NA
12. Have all applicable service requests been reviewed? yes/no/NA
13. Are all samples labeled correctly? yes/no/NA
14. Have all instructions on the service request been followed? (e.g. Special MRLs, QC on a specific sample, Form V) yes/no/NA
15. Are detection limits and units reported correctly? yes/no/NA
16. Is the unused space on the benchsheet crossed out? yes/no/NA
17. Was analysis turned in by the due date? (n-2) (If not record SR#) yes/no/NA

COMMENTS:

7235-1 RPD not within acceptance limits
 - foamy non homogeneous sample

Final Approved by: [Signature] Date: 8/16/19 DQREPORT

Analytical Results Summary

Instrument Name: K-TOC-03

Analyst: BDITZLER

Analysis Lot: 647138 Method/Testcode: SM 5310 C/TOC D

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
KQ1911609-01	Carbon, Dissolved Organic MB (DOC)			Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			8/15/19 06:54:00	N	IV
KQ1911609-02	Carbon, Dissolved Organic LCS (DOC)			Water	24.52 mg/L	10 mL	24.5 mg/L	1	0.07	0.50	98		8/15/19 07:09:00	N	IV
KQ1911609-03	Carbon, Dissolved Organic CCV (DOC)			Water	23.68 mg/L	10 mL	23.7 mg/L	1			95		8/15/19 01:42:00	N	IV
KQ1911609-04	Carbon, Dissolved Organic CCV (DOC)			Water	23.27 mg/L	10 mL	23.3 mg/L	1			93		8/15/19 06:25:00	N	IV
KQ1911609-05	Carbon, Dissolved Organic CCV (DOC)			Water	23.44 mg/L	10 mL	23.4 mg/L	1			94		8/15/19 11:09:00	N	IV
KQ1911609-06	Carbon, Dissolved Organic CCV (DOC)			Water	23.40 mg/L	10 mL	23.4 mg/L	1			94		8/15/19 15:51:00	N	IV
KQ1911609-07	Carbon, Dissolved Organic CCB (DOC)			Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			8/15/19 01:56:00	N	IV
KQ1911609-08	Carbon, Dissolved Organic CCB (DOC)			Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			8/15/19 06:40:00	N	IV
KQ1911609-09	Carbon, Dissolved Organic CCB (DOC)			Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			8/15/19 11:23:00	N	IV
KQ1911609-10	Carbon, Dissolved Organic CCB (DOC)			Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			8/15/19 16:06:00	N	IV
KQ1911609-11	Carbon, Dissolved Organic MS (DOC)		T1901331-021	Water	30.79 mg/L	10 mL	30.8 mg/L	1	0.07	0.50	102		8/15/19 05:55:00	N	IV
KQ1911609-12	Carbon, Dissolved Organic DUP (DOC)		T1901331-021	Water	5.12 mg/L	10 mL	5.12 mg/L	1	0.07	0.50		1	8/15/19 05:27:00	N	IV
KQ1911609-13	Carbon, Dissolved Organic DUP (DOC)		T1901331-022	Water	4.37 mg/L	10 mL	4.37 mg/L	1	0.07	0.50		<1	8/15/19 07:24:00	N	IV
KQ1911609-14	Carbon, Dissolved Organic DUP (DOC)		T1901331-023	Water	5.07 mg/L	10 mL	5.07 mg/L	1	0.07	0.50		<1	8/15/19 07:52:00	N	IV
KQ1911609-15	Carbon, Dissolved Organic DUP (DOC)		T1901331-024	Water	5.07 mg/L	10 mL	5.07 mg/L	1	0.07	0.50		2	8/15/19 08:20:00	N	IV
KQ1911609-16	Carbon, Dissolved Organic DUP (DOC)		T1901331-025	Water	5.19 mg/L	10 mL	5.19 mg/L	1	0.07	0.50		<1	8/15/19 08:48:00	N	IV
KQ1911609-17	Carbon, Dissolved Organic DUP (DOC)		T1901331-026	Water	5.12 mg/L	10 mL	5.12 mg/L	1	0.07	0.50		<1	8/15/19 09:16:00	N	IV
KQ1911609-18	Carbon, Dissolved Organic DUP (DOC)		T1901331-027	Water	5.21 mg/L	10 mL	5.21 mg/L	1	0.07	0.50		<1	8/15/19 09:44:00	N	IV
KQ1911609-19	Carbon, Dissolved Organic DUP (DOC)		T1901331-028	Water	4.97 mg/L	10 mL	4.97 mg/L	1	0.07	0.50		1	8/15/19 10:12:00	N	IV
KQ1911609-20	Carbon, Dissolved Organic DUP (DOC)		T1901331-029	Water	5.14 mg/L	10 mL	5.14 mg/L	1	0.07	0.50		2	8/15/19 10:40:00	N	IV
KQ1911609-21	Carbon, Dissolved Organic DUP (DOC)		T1901331-030	Water	5.11 mg/L	10 mL	5.11 mg/L	1	0.07	0.50		<1	8/15/19 11:38:00	N	IV
KQ1911609-22	Carbon, Dissolved Organic DUP (DOC)		T1901331-031	Water	4.46 mg/L	10 mL	4.46 mg/L	1	0.07	0.50		2	8/15/19 12:06:00	N	IV
KQ1911609-23	Carbon, Dissolved Organic DUP (DOC)		T1901331-032	Water	5.18 mg/L	10 mL	5.18 mg/L	1	0.07	0.50		1	8/15/19 12:34:00	N	IV

indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

CES 8/16/19

Analytical Results Summary

Instrument Name: K-TOC-03

Analyst: BDITZLER

Analysis Lot: 647138 Method/Testcode: SM 5310 C/TOC D

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
KQ1911609-24	Carbon, Dissolved Organic (DOC)	DUP	T1901331-033	Water	5.15 mg/L	10 mL	5.15 mg/L	1	0.07	0.50		1	8/15/19 13:03:00	N	IV
KQ1911609-25	Carbon, Dissolved Organic (DOC)	DUP	T1901331-034	Water	4.27 mg/L	10 mL	4.27 mg/L	1	0.07	0.50		<1	8/15/19 13:31:00	N	IV
KQ1911609-26	Carbon, Dissolved Organic (DOC)	DUP	T1901331-035	Water	2.72 mg/L	10 mL	2.72 mg/L	1	0.07	0.50		4	8/15/19 13:59:00	N	IV
KQ1911609-27	Carbon, Dissolved Organic (DOC)	DUP	T1901331-036	Water	3.87 mg/L	10 mL	3.87 mg/L	1	0.07	0.50		<1	8/15/19 14:27:00	N	IV
T1901331-021	Carbon, Dissolved Organic (DOC)	N/A		Water	5.19 mg/L	10 mL	5.19 mg/L	1	0.07	0.50			8/15/19 05:27:00	N	IV
T1901331-022	Carbon, Dissolved Organic (DOC)	N/A		Water	4.41 mg/L	10 mL	4.41 mg/L	1	0.07	0.50			8/15/19 07:24:00	N	IV
T1901331-023	Carbon, Dissolved Organic (DOC)	N/A		Water	5.07 mg/L	10 mL	5.07 mg/L	1	0.07	0.50			8/15/19 07:52:00	N	IV
T1901331-024	Carbon, Dissolved Organic (DOC)	N/A		Water	5.19 mg/L	10 mL	5.19 mg/L	1	0.07	0.50			8/15/19 08:20:00	N	IV
T1901331-025	Carbon, Dissolved Organic (DOC)	N/A		Water	5.18 mg/L	10 mL	5.18 mg/L	1	0.07	0.50			8/15/19 08:48:00	N	IV
T1901331-026	Carbon, Dissolved Organic (DOC)	N/A		Water	5.12 mg/L	10 mL	5.12 mg/L	1	0.07	0.50			8/15/19 09:16:00	N	IV
T1901331-027	Carbon, Dissolved Organic (DOC)	N/A		Water	5.19 mg/L	10 mL	5.19 mg/L	1	0.07	0.50			8/15/19 09:44:00	N	IV
T1901331-028	Carbon, Dissolved Organic (DOC)	N/A		Water	5.04 mg/L	10 mL	5.04 mg/L	1	0.07	0.50			8/15/19 10:12:00	N	IV
T1901331-029	Carbon, Dissolved Organic (DOC)	N/A		Water	5.22 mg/L	10 mL	5.22 mg/L	1	0.07	0.50			8/15/19 10:40:00	N	IV
T1901331-030	Carbon, Dissolved Organic (DOC)	N/A		Water	5.09 mg/L	10 mL	5.09 mg/L	1	0.07	0.50			8/15/19 11:38:00	N	IV
T1901331-031	Carbon, Dissolved Organic (DOC)	N/A		Water	4.54 mg/L	10 mL	4.54 mg/L	1	0.07	0.50			8/15/19 12:06:00	N	IV
T1901331-032	Carbon, Dissolved Organic (DOC)	N/A		Water	5.12 mg/L	10 mL	5.12 mg/L	1	0.07	0.50			8/15/19 12:34:00	N	IV
T1901331-033	Carbon, Dissolved Organic (DOC)	N/A		Water	5.22 mg/L	10 mL	5.22 mg/L	1	0.07	0.50			8/15/19 13:03:00	N	IV
T1901331-034	Carbon, Dissolved Organic (DOC)	N/A		Water	4.26 mg/L	10 mL	4.26 mg/L	1	0.07	0.50			8/15/19 13:31:00	N	IV
T1901331-035	Carbon, Dissolved Organic (DOC)	N/A		Water	2.83 mg/L	10 mL	2.83 mg/L	1	0.07	0.50			8/15/19 13:59:00	N	IV
T1901331-036	Carbon, Dissolved Organic (DOC)	N/A		Water	3.87 mg/L	10 mL	3.87 mg/L	1	0.07	0.50			8/15/19 14:27:00	N	IV

indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

Analytical Results Summary

Instrument Name: K-TOC-03

Analyst: BDITZLER

Analysis Lot: 647135 Method/Testcode: 9060A/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
K1907144-001	Carbon, Total Organic (TOC)	N/A		Water	8.59 mg/L	10 mL	8.59 mg/L	1		0.50			8/14/19 02:26:00	N	IV
K1907144-002	Carbon, Total Organic (TOC)	N/A		Water	9.01 mg/L	10 mL	9.01 mg/L	1		0.50			8/14/19 03:22:00	N	IV
K1907145-001	Carbon, Total Organic (TOC)	N/A		Water	12.25 mg/L	10 mL	12.2 mg/L	1		0.50			8/13/19 22:29:00	Y	IV
K1907145-002	Carbon, Total Organic (TOC)	N/A		Water	8.95 mg/L	10 mL	17.9 mg/L	2		1.0			8/14/19 00:35:00	N	IV
K1907145-003	Carbon, Total Organic (TOC)	N/A		Water	6.22 mg/L	10 mL	6.22 mg/L	1		0.50			8/14/19 01:30:00	N	IV
K1907284-001	Carbon, Total Organic (TOC)	N/A		Water	7.67 mg/L	10 mL	7.67 mg/L	1		0.50			8/14/19 04:47:00	N	IV
K1907284-002	Carbon, Total Organic (TOC)	N/A		Water	4.74 mg/L	10 mL	4.74 mg/L	1		0.50			8/14/19 05:43:00	N	IV
K1907284-003	Carbon, Total Organic (TOC)	N/A		Water	4.01 mg/L	10 mL	4.01 mg/L	1		0.50			8/14/19 06:38:00	N	IV
K1907284-004	Carbon, Total Organic (TOC)	N/A		Water	4.64 mg/L	10 mL	37.1 mg/L	8		4.0			8/14/19 07:34:00	N	IV
K1907284-005	Carbon, Total Organic (TOC)	N/A		Water	4.52 mg/L	10 mL	36.2 mg/L	8		4.0			8/14/19 08:30:00	N	IV
KQ1911605-01	Carbon, Total Organic (TOC)	MB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1		0.50			8/13/19 20:22:00	N	IV
KQ1911605-02	Carbon, Total Organic (TOC)	LCS		Water	24.56 mg/L	10 mL	24.6 mg/L	1		0.50	98		8/13/19 21:18:00	N	IV
KQ1911605-03	Carbon, Total Organic (TOC)	CCV		Water	24.08 mg/L	10 mL	24.1 mg/L	1					8/13/19 19:53:00	N	IV
KQ1911605-04	Carbon, Total Organic (TOC)	CCV		Water	23.94 mg/L	10 mL	23.9 mg/L	1					8/14/19 04:17:00	N	IV
KQ1911605-05	Carbon, Total Organic (TOC)	CCV		Water	23.85 mg/L	10 mL	23.9 mg/L	1					8/14/19 11:32:00	N	IV
KQ1911605-06	Carbon, Total Organic (TOC)	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1		0.50			8/13/19 20:08:00	N	IV
KQ1911605-07	Carbon, Total Organic (TOC)	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1		0.50			8/14/19 04:32:00	N	IV
KQ1911605-08	Carbon, Total Organic (TOC)	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1		0.50			8/14/19 11:47:00	N	IV
KQ1911605-26	Carbon, Total Organic (TOC)	MS	K1907145-001	Water	30.72 mg/L	10 mL	61.4 mg/L	2		1.0	98		8/13/19 23:25:00	N	IV
KQ1911605-27	Carbon, Total Organic (TOC)	MS	K1907145-001	Water	30.92 mg/L	10 mL	61.8 mg/L	2		1.0	99		8/13/19 23:25:00	N	IV
KQ1911605-28	Carbon, Total Organic (TOC)	MS	K1907145-001	Water	31.08 mg/L	10 mL	62.2 mg/L	2		1.0	100		8/13/19 23:25:00	N	IV
KQ1911605-29	Carbon, Total Organic (TOC)	MS	K1907145-001	Water	30.96 mg/L	10 mL	61.9 mg/L	2		1.0	99		8/13/19 23:25:00	N	IV
KQ1911605-30	Carbon, Total Organic (TOC)	DUP	K1907145-001	Water	12.24 mg/L	10 mL	12.2 mg/L	1		0.50		<1	8/13/19 22:29:00	N	IV

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indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

Analytical Results Summary

Instrument Name: K-TOC-03

Analyst: BDITZLER

Analysis Lot: 647135 Method/Testcode: 9060A/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
KQ1911605-31	Carbon, Total Organic (TOC)	TRP	K1907145-001	Water	12.25 mg/L	10 mL	12.3 mg/L	1		0.50		<1	8/13/19 22:29:00	N	IV
KQ1911605-32	Carbon, Total Organic (TOC)	QUAD	K1907145-001	Water	12.24 mg/L	10 mL	12.2 mg/L	1		0.50		<1	8/13/19 22:29:00	N	IV
KQ1911605-33	Carbon, Total Organic (TOC)	DUP	K1907145-002	Water	9.03 mg/L	10 mL	18.1 mg/L	2		1.0		<1	8/14/19 00:35:00	N	IV
KQ1911605-34	Carbon, Total Organic (TOC)	TRP	K1907145-002	Water	9.02 mg/L	10 mL	18.0 mg/L	2		1.0		<1	8/14/19 00:35:00	N	IV
KQ1911605-35	Carbon, Total Organic (TOC)	QUAD	K1907145-002	Water	9.05 mg/L	10 mL	18.1 mg/L	2		1.0		<1	8/14/19 00:35:00	N	IV
KQ1911605-36	Carbon, Total Organic (TOC)	DUP	K1907145-003	Water	6.09 mg/L	10 mL	6.09 mg/L	1		0.50		2	8/14/19 01:30:00	N	IV
KQ1911605-37	Carbon, Total Organic (TOC)	TRP	K1907145-003	Water	6.09 mg/L	10 mL	6.09 mg/L	1		0.50		1	8/14/19 01:30:00	N	IV
KQ1911605-38	Carbon, Total Organic (TOC)	QUAD	K1907145-003	Water	6.13 mg/L	10 mL	6.13 mg/L	1		0.50		<1	8/14/19 01:30:00	N	IV
KQ1911605-39	Carbon, Total Organic (TOC)	DUP	K1907144-002	Water	8.79 mg/L	10 mL	8.79 mg/L	1		0.50		2	8/14/19 03:22:00	N	IV
KQ1911605-40	Carbon, Total Organic (TOC)	TRP	K1907144-002	Water	8.75 mg/L	10 mL	8.75 mg/L	1		0.50		2	8/14/19 03:22:00	N	IV
KQ1911605-41	Carbon, Total Organic (TOC)	QUAD	K1907144-002	Water	8.79 mg/L	10 mL	8.79 mg/L	1		0.50		1	8/14/19 03:22:00	N	IV
KQ1911605-42	Carbon, Total Organic (TOC)	DUP	K1907284-001	Water	7.59 mg/L	10 mL	7.59 mg/L	1		0.50		<1	8/14/19 04:47:00	N	IV
KQ1911605-43	Carbon, Total Organic (TOC)	TRP	K1907284-001	Water	7.66 mg/L	10 mL	7.66 mg/L	1		0.50		<1	8/14/19 04:47:00	N	IV
KQ1911605-44	Carbon, Total Organic (TOC)	QUAD	K1907284-001	Water	7.62 mg/L	10 mL	7.62 mg/L	1		0.50		<1	8/14/19 04:47:00	N	IV
KQ1911605-45	Carbon, Total Organic (TOC)	DUP	K1907284-002	Water	4.68 mg/L	10 mL	4.68 mg/L	1		0.50		1	8/14/19 05:43:00	N	IV
KQ1911605-46	Carbon, Total Organic (TOC)	TRP	K1907284-002	Water	4.64 mg/L	10 mL	4.64 mg/L	1		0.50		1	8/14/19 05:43:00	N	IV
KQ1911605-47	Carbon, Total Organic (TOC)	QUAD	K1907284-002	Water	4.65 mg/L	10 mL	4.65 mg/L	1		0.50		<1	8/14/19 05:43:00	N	IV
KQ1911605-48	Carbon, Total Organic (TOC)	DUP	K1907284-003	Water	3.99 mg/L	10 mL	3.99 mg/L	1		0.50		<1	8/14/19 06:38:00	N	IV
KQ1911605-49	Carbon, Total Organic (TOC)	TRP	K1907284-003	Water	3.96 mg/L	10 mL	3.96 mg/L	1		0.50		<1	8/14/19 06:38:00	N	IV
KQ1911605-50	Carbon, Total Organic (TOC)	QUAD	K1907284-003	Water	4.02 mg/L	10 mL	4.02 mg/L	1		0.50		<1	8/14/19 06:38:00	N	IV
KQ1911605-51	Carbon, Total Organic (TOC)	DUP	K1907284-004	Water	4.62 mg/L	10 mL	37.0 mg/L	8		4.0		<1	8/14/19 07:34:00	N	IV
KQ1911605-52	Carbon, Total Organic (TOC)	TRP	K1907284-004	Water	4.64 mg/L	10 mL	37.1 mg/L	8		4.0		<1	8/14/19 07:34:00	N	IV
KQ1911605-53	Carbon, Total Organic (TOC)	QUAD	K1907284-004	Water	4.69 mg/L	10 mL	37.5 mg/L	8		4.0		<1	8/14/19 07:34:00	N	IV

indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

Analytical Results Summary

Instrument Name: K-TOC-03

Analyst: BDITZLER

Analysis Lot: 647135 Method/Testcode: 9060A/TOC T

<u>Lab Code</u>	<u>Target Analytes</u>	<u>QC</u>	<u>Parent Sample</u>	<u>Matrix</u>	<u>Raw Result</u>	<u>Sample Amt.</u>	<u>Final Result</u>	<u>Dil</u>	<u>MDL</u>	<u>PQL</u>	<u>% Rec</u>	<u>% RSD</u>	<u>Date Analyzed</u>	<u>QC?</u>	<u>Tier</u>
KQ1911605-54	Carbon, Total Organic (TOC)	DUP	K1907284-005	Water	4.55 mg/L	10 mL	36.4 mg/L	8		4.0		<1	8/14/19 08:30:00	N	IV
KQ1911605-55	Carbon, Total Organic (TOC)	TRP	K1907284-005	Water	4.53 mg/L	10 mL	36.3 mg/L	8		4.0		<1	8/14/19 08:30:00	N	IV
KQ1911605-56	Carbon, Total Organic (TOC)	QUAD	K1907284-005	Water	4.56 mg/L	10 mL	36.5 mg/L	8		4.0		<1	8/14/19 08:30:00	N	IV
KQ1911605-57	Carbon, Total Organic (TOC)	DUP	K1907144-001	Water	8.58 mg/L	10 mL	8.58 mg/L	1		0.50		<1	8/14/19 02:26:00	N	IV
KQ1911605-58	Carbon, Total Organic (TOC)	TRP	K1907144-001	Water	8.54 mg/L	10 mL	8.54 mg/L	1		0.50		<1	8/14/19 02:26:00	N	IV
KQ1911605-59	Carbon, Total Organic (TOC)	QUAD	K1907144-001	Water	8.50 mg/L	10 mL	8.50 mg/L	1		0.50		<1	8/14/19 02:26:00	N	IV

indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

Analytical Results Summary

Instrument Name: K-TOC-03

Analyst: BDITZLER

Analysis Lot: 647136 Method/Testcode: SM 5310 C/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
K1907166-001	Carbon, Total Organic	N/A		Drinking Water	0.41 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			8/14/19 09:25:00	N	I
K1907235-001	Carbon, Total Organic	N/A		Ground Water	2.50 mg/L	10 mL	2.50 mg/L	1	0.07	0.50			8/14/19 10:36:00	N	IV
K1907235-002	Carbon, Total Organic	N/A		Ground Water	2.66 mg/L	10 mL	2.66 mg/L	1	0.07	0.50			8/14/19 11:04:00	N	IV
K1907235-003	Carbon, Total Organic	N/A		Ground Water	0.85 mg/L	10 mL	0.85 mg/L	1	0.07	0.50			8/14/19 12:30:00	N	IV
K1907235-004	Carbon, Total Organic	N/A		Ground Water	0.92 mg/L	10 mL	0.92 mg/L	1	0.07	0.50			8/14/19 12:59:00	N	IV
K1907274-001	Carbon, Total Organic	N/A		Ground Water	0.56 mg/L	10 mL	0.56 mg/L	1	0.07	0.50			8/14/19 13:27:00	N	IV
K1907274-002	Carbon, Total Organic	N/A		Ground Water	0.93 mg/L	10 mL	0.93 mg/L	1	0.07	0.50			8/14/19 13:55:00	N	IV
K1907274-003	Carbon, Total Organic	N/A		Ground Water	0.94 mg/L	10 mL	0.94 mg/L	1	0.07	0.50			8/14/19 14:23:00	N	IV
K1907276-001	Carbon, Total Organic	N/A		Water	2.25 mg/L	10 mL	2.25 mg/L	1	0.07	0.50			8/14/19 14:51:00	N	IV
K1907382-001	Carbon, Total Organic	N/A		Water	1.54 mg/L	10 mL	1.54 mg/L	1	0.07	0.50			8/14/19 15:19:00	N	II
K1907383-001	Carbon, Total Organic	N/A		Water	0.29 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			8/14/19 15:47:00	N	II
K1907383-002	Carbon, Total Organic	N/A		Water	0.85 mg/L	10 mL	0.85 mg/L	1	0.07	0.50			8/14/19 16:45:00	N	II
K1907383-003	Carbon, Total Organic	N/A		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			8/14/19 17:13:00	N	II
K1907383-004	Carbon, Total Organic	N/A		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			8/14/19 17:41:00	N	II
KQ1911607-01	Carbon, Total Organic	MB		Drinking Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			8/14/19 12:01:00	N	I
KQ1911607-02	Carbon, Total Organic	LCS		Drinking Water	24.30 mg/L	10 mL	24.3 mg/L	1	0.07	0.50	97		8/14/19 12:16:00	N	I
KQ1911607-03	Carbon, Total Organic	CCV		Drinking Water	23.94 mg/L	10 mL	23.9 mg/L	1					8/14/19 04:17:00	N	I
KQ1911607-04	Carbon, Total Organic	CCV		Drinking Water	23.85 mg/L	10 mL	23.9 mg/L	1					8/14/19 11:32:00	N	I
KQ1911607-05	Carbon, Total Organic	CCV		Drinking Water	23.62 mg/L	10 mL	23.6 mg/L	1					8/14/19 16:15:00	N	I
KQ1911607-06	Carbon, Total Organic	CCV		Drinking Water	24.36 mg/L	10 mL	24.4 mg/L	1					8/14/19 20:59:00	N	I
KQ1911607-07	Carbon, Total Organic	CCB		Drinking Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			8/14/19 04:32:00	N	I
KQ1911607-08	Carbon, Total Organic	CCB		Drinking Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			8/14/19 11:47:00	N	I
KQ1911607-09	Carbon, Total Organic	CCB		Drinking Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			8/14/19 16:30:00	N	I
KQ1911607-10	Carbon, Total Organic	CCB		Drinking Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			8/14/19 21:13:00	N	I
KQ1911607-11	Carbon, Total Organic	DUP	K1907166-001	Drinking Water	0.39 mg/L	10 mL	0.39 mg/L J	1	0.07	0.50		NC	8/14/19 09:25:00	N	I
KQ1911607-12	Carbon, Total Organic	MS	K1907166-001	Drinking Water	26.15 mg/L	10 mL	26.1 mg/L	1	0.07	0.50	105		8/14/19 09:53:00	N	I
KQ1911607-13	Carbon, Total Organic	DUP	K1907235-001	Ground Water	3.10 mg/L	10 mL	3.10 mg/L	1	0.07	0.50		22*	8/14/19 10:36:00	N	IV

indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

Analytical Results Summary

Instrument Name: K-TOC-03

Analyst: BDITZLER

Analysis Lot: 647136 Method/Testcode: SM 5310 C/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
KQ1911607-14	Carbon, Total Organic	DUP	K1907235-002	Ground Water	2.59 mg/L	10 mL	2.59 mg/L	1	0.07	0.50		3	8/14/19 11:04:00	N	IV
KQ1911607-15	Carbon, Total Organic	DUP	K1907235-003	Ground Water	0.86 mg/L	10 mL	0.86 mg/L	1	0.07	0.50		1	8/14/19 12:30:00	N	IV
KQ1911607-16	Carbon, Total Organic	DUP	K1907235-004	Ground Water	0.92 mg/L	10 mL	0.92 mg/L	1	0.07	0.50		<1	8/14/19 12:59:00	N	IV
KQ1911607-17	Carbon, Total Organic	DUP	K1907274-001	Ground Water	0.51 mg/L	10 mL	0.51 mg/L	1	0.07	0.50		9	8/14/19 13:27:00	N	IV
KQ1911607-18	Carbon, Total Organic	DUP	K1907274-002	Ground Water	0.94 mg/L	10 mL	0.94 mg/L	1	0.07	0.50		1	8/14/19 13:55:00	N	IV
KQ1911607-19	Carbon, Total Organic	DUP	K1907274-003	Ground Water	1.01 mg/L	10 mL	1.01 mg/L	1	0.07	0.50		7	8/14/19 14:23:00	N	IV
KQ1911607-20	Carbon, Total Organic	DUP	K1907276-001	Water	2.18 mg/L	10 mL	2.18 mg/L	1	0.07	0.50		3	8/14/19 14:51:00	N	IV
KQ1911607-21	Carbon, Total Organic	DUP	K1907382-001	Water	1.46 mg/L	10 mL	1.46 mg/L	1	0.07	0.50		6	8/14/19 15:19:00	N	II
KQ1911607-22	Carbon, Total Organic	DUP	K1907383-001	Water	0.37 mg/L	10 mL	0.37 mg/L	J 1	0.07	0.50		NC	8/14/19 15:47:00	N	II
KQ1911607-23	Carbon, Total Organic	DUP	K1907383-002	Water	0.78 mg/L	10 mL	0.78 mg/L	1	0.07	0.50		8	8/14/19 16:45:00	N	II
KQ1911607-24	Carbon, Total Organic	DUP	K1907383-003	Water	0.00 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50		NC	8/14/19 17:13:00	N	II
KQ1911607-25	Carbon, Total Organic	DUP	K1907383-004	Water	0.06 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50		NC	8/14/19 17:41:00	N	II

indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

Analytical Results Summary

Instrument Name: K-TOC-03

Analyst: BDITZLER

Analysis Lot: 647137 Method/Testcode: SM 5310 C/TOC D

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
KQ1911608-01	Carbon, Dissolved Organic (DOC)	MB		Water	0.00 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50			8/14/19 21:28:00	N	IV
KQ1911608-02	Carbon, Dissolved Organic (DOC)	LCS		Water	25.02 mg/L	10 mL	25.0 mg/L	1	0.07	0.50	100		8/15/19 21:43:00	N	IV
KQ1911608-03	Carbon, Dissolved Organic (DOC)	CCV		Water	23.62 mg/L	10 mL	23.6 mg/L	1					8/14/19 16:15:00	N	IV
KQ1911608-04	Carbon, Dissolved Organic (DOC)	CCV		Water	24.36 mg/L	10 mL	24.4 mg/L	1					8/14/19 20:59:00	N	IV
KQ1911608-05	Carbon, Dissolved Organic (DOC)	CCV		Water	23.68 mg/L	10 mL	23.7 mg/L	1					8/15/19 01:42:00	N	IV
KQ1911608-06	Carbon, Dissolved Organic (DOC)	CCV		Water	23.27 mg/L	10 mL	23.3 mg/L	1					8/15/19 06:25:00	N	IV
KQ1911608-07	Carbon, Dissolved Organic (DOC)	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50			8/14/19 16:30:00	N	IV
KQ1911608-08	Carbon, Dissolved Organic (DOC)	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50			8/14/19 21:13:00	N	IV
KQ1911608-09	Carbon, Dissolved Organic (DOC)	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50			8/15/19 01:56:00	N	IV
KQ1911608-10	Carbon, Dissolved Organic (DOC)	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50			8/15/19 06:40:00	N	IV
KQ1911608-11	Carbon, Dissolved Organic (DOC)	MS	T1901331-001	Water	21.75 mg/L	10 mL	43.5 mg/L	2	0.2	1.0	84		8/14/19 18:37:00	N	IV
KQ1911608-12	Carbon, Dissolved Organic (DOC)	DUP	T1901331-001	Water	1.65 mg/L	10 mL	1.65 mg/L	1	0.07	0.50		2	8/14/19 18:09:00	N	IV
KQ1911608-13	Carbon, Dissolved Organic (DOC)	DUP	T1901331-002	Water	2.13 mg/L	10 mL	2.13 mg/L	1	0.07	0.50		2	8/14/19 19:06:00	N	IV
KQ1911608-14	Carbon, Dissolved Organic (DOC)	DUP	T1901331-003	Water	2.59 mg/L	10 mL	2.59 mg/L	1	0.07	0.50		5	8/14/19 19:34:00	N	IV
KQ1911608-15	Carbon, Dissolved Organic (DOC)	DUP	T1901331-004	Water	0.54 mg/L	10 mL	0.54 mg/L	1	0.07	0.50		6	8/14/19 20:02:00	N	IV
KQ1911608-16	Carbon, Dissolved Organic (DOC)	DUP	T1901331-005	Water	0.57 mg/L	10 mL	0.57 mg/L	1	0.07	0.50		8	8/14/19 20:30:00	N	IV
KQ1911608-17	Carbon, Dissolved Organic (DOC)	DUP	T1901331-006	Water	0.52 mg/L	10 mL	0.52 mg/L	1	0.07	0.50		9	8/14/19 21:57:00	N	IV
KQ1911608-18	Carbon, Dissolved Organic (DOC)	DUP	T1901331-007	Water	2.89 mg/L	10 mL	2.89 mg/L	1	0.07	0.50		1	8/14/19 22:25:00	N	IV
KQ1911608-19	Carbon, Dissolved Organic (DOC)	DUP	T1901331-008	Water	3.28 mg/L	10 mL	3.28 mg/L	1	0.07	0.50		<1	8/14/19 22:53:00	N	IV
KQ1911608-20	Carbon, Dissolved Organic (DOC)	DUP	T1901331-009	Water	3.82 mg/L	10 mL	3.82 mg/L	1	0.07	0.50		<1	8/14/19 23:21:00	N	IV
KQ1911608-21	Carbon, Dissolved Organic (DOC)	DUP	T1901331-010	Water	0.51 mg/L	10 mL	0.51 mg/L	1	0.07	0.50		NC	8/14/19 23:49:00	N	IV
KQ1911608-22	Carbon, Dissolved Organic (DOC)	DUP	T1901331-011	Water	0.66 mg/L	10 mL	0.66 mg/L	1	0.07	0.50		4	8/15/19 00:17:00	N	IV
KQ1911608-23	Carbon, Dissolved Organic (DOC)	DUP	T1901331-012	Water	1.14 mg/L	10 mL	1.14 mg/L	1	0.07	0.50		8	8/15/19 00:45:00	N	IV

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indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

Analytical Results Summary

Instrument Name: K-TOC-03

Analyst: BDITZLER

Analysis Lot: 647137 Method/Testcode: SM 5310 C/TOC D

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
KQ1911608-24	Carbon, Dissolved Organic (DOC)	DUP	T1901331-013	Water	4.49 mg/L	10 mL	4.49 mg/L	1	0.07	0.50		<1	8/15/19 01:14:00	N	IV
KQ1911608-25	Carbon, Dissolved Organic (DOC)	DUP	T1901331-014	Water	4.67 mg/L	10 mL	4.67 mg/L	1	0.07	0.50		<1	8/15/19 02:11:00	N	IV
KQ1911608-26	Carbon, Dissolved Organic (DOC)	DUP	T1901331-015	Water	4.96 mg/L	10 mL	4.96 mg/L	1	0.07	0.50		<1	8/15/19 02:39:00	N	IV
KQ1911608-27	Carbon, Dissolved Organic (DOC)	DUP	T1901331-016	Water	1.60 mg/L	10 mL	1.60 mg/L	1	0.07	0.50		9	8/15/19 03:07:00	N	IV
KQ1911608-28	Carbon, Dissolved Organic (DOC)	DUP	T1901331-017	Water	1.66 mg/L	10 mL	1.66 mg/L	1	0.07	0.50		6	8/15/19 03:35:00	N	IV
KQ1911608-29	Carbon, Dissolved Organic (DOC)	DUP	T1901331-018	Water	3.89 mg/L	10 mL	3.89 mg/L	1	0.07	0.50		<1	8/15/19 04:03:00	N	IV
KQ1911608-30	Carbon, Dissolved Organic (DOC)	DUP	T1901331-019	Water	5.15 mg/L	10 mL	5.15 mg/L	1	0.07	0.50		<1	8/15/19 04:31:00	N	IV
KQ1911608-31	Carbon, Dissolved Organic (DOC)	DUP	T1901331-020	Water	5.17 mg/L	10 mL	5.17 mg/L	1	0.07	0.50		<1	8/15/19 04:59:00	N	IV
T1901331-001	Carbon, Dissolved Organic (DOC)	N/A		Water	1.62 mg/L	10 mL	1.62 mg/L	1	0.07	0.50			8/14/19 18:09:00	N	IV
T1901331-002	Carbon, Dissolved Organic (DOC)	N/A		Water	2.18 mg/L	10 mL	2.18 mg/L	1	0.07	0.50			8/14/19 19:06:00	N	IV
T1901331-003	Carbon, Dissolved Organic (DOC)	N/A		Water	2.47 mg/L	10 mL	2.47 mg/L	1	0.07	0.50			8/14/19 19:34:00	N	IV
T1901331-004	Carbon, Dissolved Organic (DOC)	N/A		Water	0.51 mg/L	10 mL	0.51 mg/L	1	0.07	0.50			8/14/19 20:02:00	N	IV
T1901331-005	Carbon, Dissolved Organic (DOC)	N/A		Water	0.53 mg/L	10 mL	0.53 mg/L	1	0.07	0.50			8/14/19 20:30:00	N	IV
T1901331-006	Carbon, Dissolved Organic (DOC)	N/A		Water	0.57 mg/L	10 mL	0.57 mg/L	1	0.07	0.50			8/14/19 21:57:00	N	IV
T1901331-007	Carbon, Dissolved Organic (DOC)	N/A		Water	2.86 mg/L	10 mL	2.86 mg/L	1	0.07	0.50			8/14/19 22:25:00	N	IV
T1901331-008	Carbon, Dissolved Organic (DOC)	N/A		Water	3.29 mg/L	10 mL	3.29 mg/L	1	0.07	0.50			8/14/19 22:53:00	N	IV
T1901331-009	Carbon, Dissolved Organic (DOC)	N/A		Water	3.81 mg/L	10 mL	3.81 mg/L	1	0.07	0.50			8/14/19 23:21:00	N	IV
T1901331-010	Carbon, Dissolved Organic (DOC)	N/A		Water	0.50 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			8/14/19 23:49:00	N	IV
T1901331-011	Carbon, Dissolved Organic (DOC)	N/A		Water	0.64 mg/L	10 mL	0.64 mg/L	1	0.07	0.50			8/15/19 00:17:00	N	IV
T1901331-012	Carbon, Dissolved Organic (DOC)	N/A		Water	1.24 mg/L	10 mL	1.24 mg/L	1	0.07	0.50			8/15/19 00:45:00	N	IV
T1901331-013	Carbon, Dissolved Organic (DOC)	N/A		Water	4.51 mg/L	10 mL	4.51 mg/L	1	0.07	0.50			8/15/19 01:14:00	N	IV
T1901331-014	Carbon, Dissolved Organic (DOC)	N/A		Water	4.70 mg/L	10 mL	4.70 mg/L	1	0.07	0.50			8/15/19 02:11:00	N	IV
T1901331-015	Carbon, Dissolved Organic (DOC)	N/A		Water	4.99 mg/L	10 mL	4.99 mg/L	1	0.07	0.50			8/15/19 02:39:00	N	IV

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indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

Analytical Results Summary

Instrument Name: K-TOC-03

Analyst: BDITZLER

Analysis Lot: 647137 Method/Testcode: SM 5310 C/TOC D

<u>Lab Code</u>	<u>Target Analytes</u>	<u>QC</u>	<u>Parent Sample</u>	<u>Matrix</u>	<u>Raw Result</u>	<u>Sample Amt.</u>	<u>Final Result</u>	<u>Dil</u>	<u>MDL</u>	<u>PQL</u>	<u>% Rec</u>	<u>% RSD</u>	<u>Date Analyzed</u>	<u>QC?</u>	<u>Tier</u>
T1901331-016	Carbon, Dissolved Organic (DOC)	N/A		Water	1.76 mg/L	10 mL	1.76 mg/L	1	0.07	0.50			8/15/19 03:07:00	N	IV
T1901331-017	Carbon, Dissolved Organic (DOC)	N/A		Water	1.76 mg/L	10 mL	1.76 mg/L	1	0.07	0.50			8/15/19 03:35:00	N	IV
T1901331-018	Carbon, Dissolved Organic (DOC)	N/A		Water	3.91 mg/L	10 mL	3.91 mg/L	1	0.07	0.50			8/15/19 04:03:00	N	IV
T1901331-019	Carbon, Dissolved Organic (DOC)	N/A		Water	5.15 mg/L	10 mL	5.15 mg/L	1	0.07	0.50			8/15/19 04:31:00	N	IV
T1901331-020	Carbon, Dissolved Organic (DOC)	N/A		Water	5.21 mg/L	10 mL	5.21 mg/L	1	0.07	0.50			8/15/19 04:59:00	N	IV

indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

TOC: 647135
647136

DOC: 647137
647138

Schedule: 08132019

Version: 6

Instrument: Fusion1

Last Saved by: Fusion1 (Fusion1)

Last Saved on: 2019/08/13 19:09 - Tuesday

Position	Sample Type	Sample ID	Method ID (Calibration ID)	Reps	Use	State
(Clean)	Clean	Clean		1	True	Ready
(Clean)	Clean	Clean		1	True	Ready
(Clean)	Clean	Clean		1	True	Ready
(Blank)	Blank	Reagent/Acid Blank		1	True	Ready
D	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
1	Sample	MB1	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
C	Check Standard	[TOC] LCS [24.0 ppm]	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
2	Sample	ICS	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
3	Sample	K1907145-001.07	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
4	Sample	K1907145-001.07 ms 2x	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
5	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
6	Sample	K1907145-002.02 2x	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
7	Sample	K1907145-003.02	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
8	Sample	K1907144-001.02	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
9	Sample	K1907144-002.02	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
10	Sample	K1907284-001.02	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
11	Sample	K1907284-002.02	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
12	Sample	K1907284-003.02	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
13	Sample	K1907284-004.02 8x	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
14	Sample	K1907284-005.02 8x	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
15	Sample	K1907166-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
16	Sample	K1907166-001.01 ms	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
17	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
18	Sample	K1907235-001.02	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
19	Sample	K1907235-002.02	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
20	Sample	MB2	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
C	Check Standard	[TOC] LCS [24.0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
21	Sample	K1907235-003.02	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
22	Sample	K1907235-004.02	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
23	Sample	K1907274-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
24	Sample	K1907274-002.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
25	Sample	K1907274-003.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
26	Sample	K1907276-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
27	Sample	K1907382-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
28	Sample	K1907383-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
29	Sample	K1907383-002.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
30	Sample	K1907383-003.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
31	Sample	K1907383-004.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
32	Sample	T1901331-001.05 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
33	Sample	T1901331-001.05 ms doc 2x	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
34	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
35	Sample	T1901331-002.05 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
36	Sample	T1901331-003.05 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
37	Sample	T1901331-004.05 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
38	Sample	T1901331-005.05 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready

Printed on: August 15, 2019 17:44:01

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Schedule: 08132019

Position	Sample Type	Sample ID	Method ID (Calibration ID)	Reps	Use	State
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
39	Sample	MB3	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
C	Check Standard	[TOC] LCS [25.0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
40	Sample	T1901331-006.05 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
41	Sample	T1901331-007.05 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
42	Sample	T1901331-008.05 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
43	Sample	T1901331-009.05 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
44	Sample	T1901331-010.05 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
45	Sample	T1901331-011.05 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
46	Sample	T1901331-012.05 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
47	Sample	T1901331-013.05 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
48	Sample	T1901331-014.05 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
49	Sample	T1901331-015.05 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
50	Sample	T1901331-016.05 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
51	Sample	T1901331-017.05 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
52	Sample	T1901331-018.05 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
53	Sample	T1901331-019.05 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
54	Sample	T1901331-020.05 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
55	Sample	T1901331-021.05 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
56	Sample	T1901331-021.05 ms doc	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
57	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
58	Sample	MB4	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
C	Check Standard	[TOC] LCS [25.0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
59	Sample	T1901331-022.05 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
60	Sample	T1901331-023.05 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
61	Sample	T1901331-024.05 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
62	Sample	T1901331-025.05 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
63	Sample	T1901331-026.05 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
64	Sample	T1901331-027.05 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
65	Sample	T1901331-028.05 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
66	Sample	T1901331-029.05 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
67	Sample	T1901331-030.05 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
68	Sample	T1901331-031.05 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
69	Sample	T1901331-032.05 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
70	Sample	T1901331-033.05 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
71	Sample	T1901331-034.05 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
72	Sample	T1901331-035.05 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
73	Sample	T1901331-036.05 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
74	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
75	Sample	Lot check 190516	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
					False	

StarLIMS Run: 647138, 647137, 647135, 647136
Analysis: DOC/TOC
Method: SM 5310 C, 9060A

CCV: 11-GEN-05-79K 50 ppm LCS: 11-GEN-05-79J 25.0 ppm

ICAL Date: 3/6/19

ICAL ID: 11-GEN-05-76H

ICS ID: 11-GEN-05-74A

ICS TV: 25.0 ppm ICS % R = 2

Spike ID: 11-GEN-05-77J 0.05 ml of 5000 ppm stock ---> 10.0 ml = 25.0 ppm x dilution factor

Sodium Persulfate: 11-GEN-05-79O

21 % H3PO4: 11-GEN-05-80A

Equipment ID: K-TOC-03

PIPETTE ID: 124276B, 129001F, N11314F, Marge

FILTER ID: N/A

Analyzed By: <u>CES</u>	Date Analyzed: <u>8/15/19</u>
Reviewed By: <u>[Signature]</u>	Date Reviewed: <u>8/16/19</u>

Fusion Report - 08132019

Tuesday, August 13, 2019 05:58 PM

(View - Repts, Unused Repts, Meta-Data, Signature, History)
Printed on 2019/08/15 17:44 - Thursday

Report Summary Information

Company Location: Gen Chem Lab
 Schedule Name: 08132019
 Instrument Name: Fusion1
 Report Version: 1 of 1
 Report Creation by Operators (schedule version): Fusion1 (Fusion1) (v1)
 Fusion1 (Fusion1) (v2)
 Fusion1 (Fusion1) (v3)
 Fusion1 (Fusion1) (v5)
 Fusion1 (Fusion1) (v6)
 Engine Version: 1.1.5.1
 Firmware Version: 1.2.0696
 Connection: RS232 COM1
 Comment:

Report Results

Sample Type: Clean							From Schedule Version 1
Pos	Analysis Type	Sample ID			Start Time		
◆ (clean)		Clean			2019/08/13 17:58		
Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time	
1	IC Clean	12.23	17.62	5.39	49.52	05:19	
2	TC Clean	14.45	17.83	3.38	50.18	04:03	
3	TC Clean	4.21	7.69	3.47	50.18	03:48	
4	TC Clean	3.03	6.44	3.41	50.13	03:46	

Sample Type: Clean							From Schedule Version 2
Pos	Analysis Type	Sample ID			Start Time		
◆ (clean)		Clean			2019/08/13 18:20		
Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time	
1	IC Clean	11.15	14.57	3.43	49.49	05:12	
2	TC Clean	9.19	12.58	3.39	50.12	04:02	
3	TC Clean	5.21	8.67	3.47	50.21	03:46	

4	TC Clean	3.70	7.06	3.36	50.26	03:48
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Sample Type: Clean From Schedule Version 3

Pos	Analysis Type	Sample ID			Start Time	
◆ (clean)		Clean			2019/08/13 18:42	
Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	10.81	14.16	3.36	49.71	05:07
2	TC Clean	6.25	9.60	3.35	50.18	04:04
3	TC Clean	3.61	7.16	3.55	50.23	03:45
4	TC Clean	2.76	6.13	3.38	50.17	03:46

Sample Type: Blank (Creating v1284) From Schedule Version 5

Pos	Analysis Type	Sample ID			Start Time	
◆ (blank)		Reagent/Acid Blank			2019/08/13 19:05	
Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	10.85	14.22	3.37	49.55	05:12
2	TC Clean	5.97	9.31	3.34	50.19	04:04
3	TC Clean	3.05	6.43	3.38	50.20	03:47
4	TC Clean	2.42	5.81	3.38	50.12	03:52
5	Reagent Blank	3.95	7.18	3.23	50.18	05:04
6	Acid Blank	1.44	4.66	3.23	49.61	05:24

Sample Type: Sample From Schedule Version 6

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time		
◆ D	TOC	RB	0.3158 ppm	0.0000 ppm	0.0000%	2019/08/13 19:38		
Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.3158	3.1579	10.92	14.23	3.30	50.08	10:31
Dilution		Blank Contribution		Method	Calibration			
1:10		(TC) 8.7794 (IC) (v1284)		CAS_salt_010711 (v4)	CAS_salt_010711 (v30)			

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 6

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◊ B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	24.0809 ppm (PASS)	0.0000 ppm	0%	2019/08/13 19:53

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.0809	240.8087	172.92	176.23	3.31	50.13	10:29

Completion State **Success Action** **Method** **Calibration** **STD Conc - Pos B**
 Success - Criteria met. Do Nothing CAS_salt_010711 (v4) CAS_salt_010711 (v30) 50 ppmC

Sample Type: Check Standard --> CCB From Schedule Version 6

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◊ D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/08/13 20:08

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	7.08	10.50	3.42	50.11	10:30

Completion State **Success Action** **Method** **Calibration** **STD Conc - Pos D**
 Success - Criteria met. Do Nothing CAS_salt_010711 (v4) CAS_salt_010711 (v30) 0 ppmC

Sample Type: Sample From Schedule Version 6

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◊ 1	TOC	MB1	0.0000 ppm	0.0000 ppm	0.0000%	2019/08/13 20:22

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.18	9.53	3.35	50.12	10:28
2	TOC	0.0000	0.0000	6.42	9.79	3.37	50.10	10:26
3	TOC	0.0000	0.0000	5.72	9.09	3.37	50.12	10:27
4	TOC	0.0000	0.0000	5.94	9.00	3.06	50.11	10:27

Dilution **Blank Contribution** **Method** **Calibration**
 1:10 (TC) 8.7794 (IC) (v1284) CAS_salt_010711 (v4) CAS_salt_010711 (v30)

Sample Type: Check Standard --> LCS From Schedule Version 6

Concentration	Min / Max

Pos	BAT	(ppm)	Dil	Sample ID	(% dev)	Result	Std. Dev.	RSD	Start Time
♦ C	TOC	25.0000	1:1	[TOC] LCS [24.0 ppm]	0 / infinity (NA / NA)	24.5556 ppm (PASS)	0.0898 ppm	0.37%	2019/08/13 21:18

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	24.5038	245.0382	175.79	179.06	3.26	50.10	10:28
C	TOC	25.0 ppm	2	24.5673	245.6732	176.22	179.39	3.16	50.08	10:26
C	TOC	25.0 ppm	3	24.4744	244.7436	175.59	178.80	3.20	50.09	10:27
C	TOC	25.0 ppm	4	24.6771	246.7707	176.97	180.27	3.31	50.08	10:25

Completion State	Success Action	Method	Calibration	STD Conc - Pos C
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	25 ppmC

Sample Type: Sample

From Schedule Version 6

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
♦ 2	TOC	ICS	0.4496 ppm	0.0000 ppm	0.0000%	2019/08/13 22:14

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.4496	4.4956	11.83	15.28	3.45	50.10	10:32

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7794 (IC) (v1284)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
♦ 3	TOC	K1907145-001.07	12.2454 ppm	0.0079 ppm	0.0600%	2019/08/13 22:29

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	12.2497	122.4975	91.93	95.25	3.32	50.10	10:27
2	TOC	12.2437	122.4371	91.89	95.17	3.28	50.12	10:24
3	TOC	12.2531	122.5314	91.95	95.25	3.30	50.14	10:26
4	TOC	12.2352	122.3516	91.83	95.13	3.30	50.11	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7794 (IC) (v1284)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
♦ 4	TOC	K1907145-001.07 ms 2x	30.9202 ppm	0.1526 ppm	0.4900%	2019/08/13 23:25

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	30.9616	309.6161	218.94	222.21	3.27	50.14	10:29
2	TOC	31.0842	310.8418	219.78	223.09	3.32	50.14	10:25
3	TOC	30.9179	309.1785	218.65	222.05	3.40	50.14	10:30

4	TOC	30.7171	307.1706	217.28	220.53	3.25	50.17	10:27
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Dilution 1:10
Blank Contribution (TC) 8.7794 (IC) (v1284)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
5	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2019/08/14 00:20

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.64	9.99	3.34	50.19	10:34

Dilution 1:10
Blank Contribution (TC) 8.7794 (IC) (v1284)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
6	TOC	K1907145-002.02 2x	9.0108 ppm	0.0411 ppm	0.4600%	2019/08/14 00:35

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	8.9514	89.5140	69.54	72.80	3.26	50.19	10:28
2	TOC	9.0262	90.2624	70.05	73.32	3.27	50.22	10:25
3	TOC	9.0200	90.2005	70.01	73.47	3.46	50.22	10:26
4	TOC	9.0455	90.4554	70.18	73.62	3.44	50.25	10:30

Dilution 1:10
Blank Contribution (TC) 8.7794 (IC) (v1284)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
7	TOC	K1907145-003.02	6.1331 ppm	0.0584 ppm	0.9500%	2019/08/14 01:30

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	6.2177	62.1773	50.98	54.26	3.28	50.27	10:26
2	TOC	6.0944	60.9442	50.15	53.47	3.32	50.26	10:28
3	TOC	6.0941	60.9413	50.15	53.52	3.38	50.26	10:23
4	TOC	6.1261	61.2609	50.36	53.71	3.35	50.28	10:29

Dilution 1:10
Blank Contribution (TC) 8.7794 (IC) (v1284)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
8	TOC	K1907144-001.02	8.5535 ppm	0.0398 ppm	0.4700%	2019/08/14 02:26

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	8.5881	85.8811	67.08	70.51	3.43	50.28	10:24
2	TOC	8.5803	85.8030	67.02	70.41	3.38	50.30	10:30
3	TOC	8.5446	85.4465	66.78	70.07	3.29	50.31	10:27
4	TOC	8.5009	85.0089	66.48	69.90	3.41	50.32	10:28

<u>Dilution</u>		<u>Blank Contribution</u>		<u>Method</u>		<u>Calibration</u>	
1:10		(TC) 8.7794 (IC) (v1284)		CAS_salt_010711 (v4)		CAS_salt_010711 (v30)	

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
9	TOC	K1907144-002.02	8.8362 ppm	0.1188 ppm	1.3400%	2019/08/14 03:22

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	9.0122	90.1224	69.95	73.16	3.20	50.34	10:27
2	TOC	8.7923	87.9229	68.46	71.73	3.27	50.36	10:26
3	TOC	8.7519	87.5193	68.19	71.59	3.41	50.36	10:25
4	TOC	8.7882	87.8817	68.43	71.67	3.23	50.37	10:28

<u>Dilution</u>		<u>Blank Contribution</u>		<u>Method</u>		<u>Calibration</u>	
1:10		(TC) 8.7794 (IC) (v1284)		CAS_salt_010711 (v4)		CAS_salt_010711 (v30)	

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 6

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	23.9417 ppm (PASS)	0.0000 ppm	0%	2019/08/14 04:17

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	23.9417	239.4165	171.98	175.31	3.34	50.37	10:33

<u>Completion State</u>	<u>Success Action</u>	<u>Method</u>	<u>Calibration</u>	<u>STD Conc - Pos B</u>
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	50 ppmC

Sample Type: Check Standard --> CCB From Schedule Version 6

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/08/14 04:32

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	6.18	9.59	3.41	50.40	10:34

<u>Completion State</u>	<u>Success Action</u>	<u>Method</u>	<u>Calibration</u>	<u>STD Conc - Pos D</u>
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	0 ppmC

Sample Type: Sample From Schedule Version 6

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
10	TOC	K1907284-001.02	7.6325 ppm	0.0339 ppm	0.4400%	2019/08/14 04:47

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	7.6657	76.6574	60.81	64.15	3.34	50.41	10:30
2	TOC	7.5933	75.9325	60.32	63.57	3.25	50.41	10:28
3	TOC	7.6553	76.5528	60.74	64.09	3.35	50.41	10:28
4	TOC	7.6158	76.1579	60.48	63.70	3.23	50.44	10:30

Dilution 1:10 Blank Contribution (TC) 8.7794 (IC) (v1284) Method CAS_salt_010711 (v4) Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
11	TOC	K1907284-002.02	4.6789 ppm	0.0442 ppm	0.9400%	2019/08/14 05:43

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.7408	47.4084	40.96	44.32	3.36	50.47	10:26
2	TOC	4.6799	46.7985	40.55	43.86	3.32	50.47	10:28
3	TOC	4.6432	46.4317	40.30	43.59	3.29	50.47	10:28
4	TOC	4.6517	46.5171	40.36	43.62	3.26	50.47	10:27

Dilution 1:10 Blank Contribution (TC) 8.7794 (IC) (v1284) Method CAS_salt_010711 (v4) Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
12	TOC	K1907284-003.02	3.9965 ppm	0.0249 ppm	0.6200%	2019/08/14 06:38

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.0073	40.0734	35.98	39.25	3.27	50.50	10:26
2	TOC	3.9945	39.9452	35.89	39.10	3.20	50.50	10:27
3	TOC	3.9630	39.6299	35.68	38.96	3.28	50.51	10:30
4	TOC	4.0213	40.2133	36.08	39.45	3.37	50.53	10:25

Dilution 1:10 Blank Contribution (TC) 8.7794 (IC) (v1284) Method CAS_salt_010711 (v4) Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
13	TOC	K1907284-004.02 8x	4.6472 ppm	0.0317 ppm	0.6800%	2019/08/14 07:34

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.6367	46.3669	40.25	43.82	3.56	50.54	10:31
2	TOC	4.6205	46.2048	40.14	43.27	3.13	50.52	10:29
3	TOC	4.6385	46.3846	40.26	43.66	3.39	50.56	10:28
4	TOC	4.6933	46.9326	40.64	43.97	3.33	50.59	10:25

Dilution Blank Contribution Method Calibration

1:10 (TC) 8.7794 (IC) CAS_salt_010711 CAS_salt_010711
(v1284) (v4) (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
14	TOC	K1907284-005.02 8x	4.5431 ppm	0.0182 ppm	0.4000%	2019/08/14 08:30

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.5218	45.2178	39.47	42.87	3.40	50.49	10:26
2	TOC	4.5543	45.5434	39.69	42.85	3.15	50.53	10:30
3	TOC	4.5347	45.3474	39.56	42.84	3.28	50.46	10:29
4	TOC	4.5617	45.6170	39.74	42.94	3.19	50.42	10:30

Dilution 1:10 Blank Contribution (TC) 8.7794 (IC) (v1284) Method CAS_salt_010711 (v4) Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
15	TOC	K1907166-001.01	0.3970 ppm	0.0144 ppm	3.6200%	2019/08/14 09:25

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.4071	4.0713	11.54	14.63	3.08	50.42	10:27
2	TOC	0.3868	3.8680	11.40	14.59	3.19	50.38	10:24

Dilution 1:10 Blank Contribution (TC) 8.7794 (IC) (v1284) Method CAS_salt_010711 (v4) Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
16	TOC	K1907166-001.01 ms	26.1465 ppm	0.0000 ppm	0.0000%	2019/08/14 09:53

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	26.1465	261.4645	186.26	189.49	3.23	50.36	10:31

Dilution 1:10 Blank Contribution (TC) 8.7794 (IC) (v1284) Method CAS_salt_010711 (v4) Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
17	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2019/08/14 10:08

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.06	9.34	3.28	50.33	10:30
2	TOC	0.0000	0.0000	6.00	9.28	3.27	50.44	10:28

Dilution 1:10 Blank Contribution (TC) 8.7794 (IC) (v1284) Method CAS_salt_010711 (v4) Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
18	TOC	K1907235-001.02	2.8002 ppm	0.4286 ppm	15.3000%	2019/08/14 10:36

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.4972	24.9716	25.73	29.05	3.32	50.42	10:26
2	TOC	3.1032	31.0323	29.84	32.92	3.08	50.47	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7794 (IC) (v1284)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
19	TOC	K1907235-002.02	2.6271 ppm	0.0531 ppm	2.0200%	2019/08/14 11:04

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.6647	26.6466	26.87	30.24	3.37	50.43	10:27
2	TOC	2.5895	25.8953	26.36	29.84	3.48	50.48	10:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7794 (IC) (v1284)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 6

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	23.8538 ppm (PASS)	0.0000 ppm	0%	2019/08/14 11:32

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	23.8538	238.5385	171.38	174.75	3.37	50.63	10:30

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	50 ppmC

Sample Type: Check Standard --> CCB From Schedule Version 6

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/08/14 11:47

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	6.28	9.55	3.28	50.66	10:34

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	0 ppmC

Sample Type: Sample

From Schedule Version 6

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
20	TOC	MB2	0.0000 ppm	0.0000 ppm	0.0000%	2019/08/14 12:01

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	5.36	8.57	3.22	50.60	10:28

Dilution

1:10

Blank Contribution(TC) 8.7794 (IC)
(v1284)**Method**CAS_salt_010711
(v4)**Calibration**CAS_salt_010711
(v30)**Sample Type:** Check Standard --> LCS

From Schedule Version 6

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
C	TOC	25.0000	1:1	[TOC] LCS [24.0 ppm]	0 / infinity (NA / NA)	24.2958 ppm (PASS)	0.0000 ppm	0%	2019/08/14 12:16

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	24.2958	242.9581	174.38	177.72	3.34	50.58	10:30

Completion State

Success - Criteria met.

Success Action

Do Nothing

MethodCAS_salt_010711
(v4)**Calibration**CAS_salt_010711
(v30)**STD Conc - Pos C**

25 ppmC

Sample Type: Sample

From Schedule Version 6

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
21	TOC	K1907235-003.02	0.8505 ppm	0.0078 ppm	0.9200%	2019/08/14 12:30

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.8450	8.4496	14.52	18.00	3.48	50.57	10:27
2	TOC	0.8560	8.5601	14.59	17.75	3.16	50.56	10:31

Dilution

1:10

Blank Contribution(TC) 8.7794 (IC)
(v1284)**Method**CAS_salt_010711
(v4)**Calibration**CAS_salt_010711
(v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
22	TOC	K1907235-004.02	0.9212 ppm	0.0028 ppm	0.3100%	2019/08/14 12:59

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.9192	9.1921	15.02	18.27	3.25	50.53	10:30
2	TOC	0.9232	9.2319	15.05	18.37	3.32	50.51	10:25

Dilution

1:10

Blank Contribution

(TC) 8.7794 (IC)

Method

CAS_salt_010711

Calibration

CAS_salt_010711

(v1284)

(v4)

(v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
23	TOC	K1907274-001.01	0.5341 ppm	0.0350 ppm	6.5500%	2019/08/14 13:27

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.5589	5.5887	12.57	15.79	3.21	50.46	10:30
2	TOC	0.5094	5.0937	12.24	15.70	3.46	50.49	10:26

Dilution

1:10

Blank Contribution(TC) 8.7794 (IC)
(v1284)MethodCAS_salt_010711
(v4)CalibrationCAS_salt_010711
(v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
24	TOC	K1907274-002.01	0.9374 ppm	0.0074 ppm	0.7900%	2019/08/14 13:55

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.9322	9.3218	15.11	18.50	3.39	50.48	10:28
2	TOC	0.9426	9.4264	15.18	18.63	3.46	50.46	10:26

Dilution

1:10

Blank Contribution(TC) 8.7794 (IC)
(v1284)MethodCAS_salt_010711
(v4)CalibrationCAS_salt_010711
(v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
25	TOC	K1907274-003.01	0.9731 ppm	0.0490 ppm	5.0300%	2019/08/14 14:23

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.9385	9.3851	15.15	18.53	3.38	50.47	10:27
2	TOC	1.0078	10.0775	15.62	18.89	3.27	50.51	10:26

Dilution

1:10

Blank Contribution(TC) 8.7794 (IC)
(v1284)MethodCAS_salt_010711
(v4)CalibrationCAS_salt_010711
(v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
26	TOC	K1907276-001.01	2.2153 ppm	0.0508 ppm	2.2900%	2019/08/14 14:51

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.2513	22.5128	24.06	27.33	3.27	50.45	10:28
2	TOC	2.1794	21.7939	23.57	26.80	3.23	50.41	10:32

Dilution

1:10

Blank Contribution(TC) 8.7794 (IC)
(v1284)MethodCAS_salt_010711
(v4)CalibrationCAS_salt_010711
(v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
27	TOC	K1907382-001.01	1.4974 ppm	0.0598 ppm	3.9900%	2019/08/14 15:19

Rep	Base	ppm	µg	Adjusted	NDIR (Abs)	Baseline	Pressure	Run

#	Analysis Type		(Abs)	(Abs)	(psig)	Time
1	TOC	1.5397	15.3972	19.23	22.57	10:31
2	TOC	1.4552	14.5516	18.66	21.96	10:28

<u>Dilution</u>	<u>Blank Contribution</u>	<u>Method</u>	<u>Calibration</u>
1:10	(TC) 8.7794 (IC) (v1284)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
28	TOC	K1907383-001.01	0.3285 ppm	0.0576 ppm	17.5300%	2019/08/14 15:47

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.2878	2.8780	10.73	14.10	3.37	50.46	10:30
2	TOC	0.3693	3.6927	11.29	14.55	3.27	50.42	10:26

<u>Dilution</u>	<u>Blank Contribution</u>	<u>Method</u>	<u>Calibration</u>
1:10	(TC) 8.7794 (IC) (v1284)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 6

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	23.6193 ppm (PASS)	0.0000 ppm	0%	2019/08/14 16:15

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	23.6193	236.1932	169.79	172.95	3.16	50.41	10:30

<u>Completion State</u>	<u>Success Action</u>	<u>Method</u>	<u>Calibration</u>	<u>STD Conc - Pos B</u>
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	50 ppmC

Sample Type: Check Standard --> CCB From Schedule Version 6

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/08/14 16:30

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	5.80	9.05	3.25	50.40	10:36

<u>Completion State</u>	<u>Success Action</u>	<u>Method</u>	<u>Calibration</u>	<u>STD Conc - Pos D</u>
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	0 ppmC

Sample Type: Sample

From Schedule Version 6

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
29	TOC	K1907383-002.01	0.8131 ppm	0.0452 ppm	5.5600%	2019/08/14 16:45

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.8451	8.4511	14.52	17.74	3.23	50.43	10:28
2	TOC	0.7812	7.8117	14.08	17.46	3.37	50.40	10:27

Dilution 1:10
Blank Contribution (TC) 8.7794 (IC) (v1284)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
30	TOC	K1907383-003.01	0.0000 ppm	0.0000 ppm	0.0000%	2019/08/14 17:13

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	8.08	11.47	3.40	50.41	10:25
2	TOC	0.0000	0.0000	7.94	11.42	3.48	50.41	10:24

Dilution 1:10
Blank Contribution (TC) 8.7794 (IC) (v1284)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
31	TOC	K1907383-004.01	0.0307 ppm	0.0434 ppm	141.4200%	2019/08/14 17:41

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	8.43	11.84	3.41	50.45	10:28
2	TOC	0.0614	0.6137	9.20	12.28	3.08	50.43	10:24

Dilution 1:10
Blank Contribution (TC) 8.7794 (IC) (v1284)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
32	TOC	T1901331-001.05 doc	1.6386 ppm	0.0198 ppm	1.2100%	2019/08/14 18:09

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.6246	16.2458	19.81	23.15	3.34	50.46	10:25
2	TOC	1.6526	16.5257	20.00	23.30	3.31	50.45	10:26

Dilution 1:10
Blank Contribution (TC) 8.7794 (IC) (v1284)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
33	TOC	T1901331-001.05 ms doc 2x	21.7509 ppm	0.0000 ppm	0.0000%	2019/08/14 18:37

Rep	Base	ppm	µg	Adjusted	NDIR (Abs)	Baseline	Pressure	Run
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#	Analysis Type			(Abs)		(Abs)	(psig)	Time
1	TOC	21.7509	217.5086	156.42	159.77	3.34	50.43	10:30

Dilution 1:10
Blank Contribution (TC) 8.7794 (IC) (v1284)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
34	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2019/08/14 18:52

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	5.76	9.15	3.39	50.38	10:34

Dilution 1:10
Blank Contribution (TC) 8.7794 (IC) (v1284)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
35	TOC	T1901331-002.05 doc	2.1533 ppm	0.0367 ppm	1.7000%	2019/08/14 19:06

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.1792	21.7924	23.57	26.84	3.27	50.30	10:25
2	TOC	2.1274	21.2738	23.22	26.60	3.38	50.24	10:26

Dilution 1:10
Blank Contribution (TC) 8.7794 (IC) (v1284)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
36	TOC	T1901331-003.05 doc	2.5274 ppm	0.0860 ppm	3.4000%	2019/08/14 19:34

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.4665	24.6652	25.52	28.98	3.46	50.18	10:29
2	TOC	2.5882	25.8820	26.35	29.65	3.30	50.16	10:26

Dilution 1:10
Blank Contribution (TC) 8.7794 (IC) (v1284)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
37	TOC	T1901331-004.05 doc	0.5220 ppm	0.0236 ppm	4.5300%	2019/08/14 20:02

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.5052	5.0524	12.21	15.40	3.19	50.13	10:32
2	TOC	0.5387	5.3868	12.44	15.51	3.07	50.13	10:28

Dilution 1:10
Blank Contribution (TC) 8.7794 (IC) (v1284)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
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38	TOC	T1901331-005.05 doc	0.5488 ppm	0.0303 ppm	5.5200%	2019/08/14 20:30		
Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.5273	5.2734	12.36	15.64	3.28	50.12	10:32
2	TOC	0.5702	5.7021	12.65	15.83	3.18	50.10	10:30
<u>Dilution</u>		<u>Blank Contribution</u>		<u>Method</u>	<u>Calibration</u>			
1:10		(TC) 8.7794 (IC) (v1284)		CAS_salt_010711 (v4)	CAS_salt_010711 (v30)			

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 6

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time	
B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	24.3640 ppm (PASS)	0.0000 ppm	0%	2019/08/14 20:59	
Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.3640	243.6402	174.84	178.13	3.29	50.11	10:33
<u>Completion State</u>		<u>Success Action</u>		<u>Method</u>	<u>Calibration</u>		<u>STD Conc - Pos B</u>			
Success - Criteria met.		Do Nothing		CAS_salt_010711 (v4)	CAS_salt_010711 (v30)		50 ppmC			

Sample Type: Check Standard --> CCB From Schedule Version 6

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time	
D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/08/14 21:13	
Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	5.70	9.11	3.41	50.11	10:31
<u>Completion State</u>		<u>Success Action</u>		<u>Method</u>	<u>Calibration</u>		<u>STD Conc - Pos D</u>			
Success - Criteria met.		Do Nothing		CAS_salt_010711 (v4)	CAS_salt_010711 (v30)		0 ppmC			

Sample Type: Sample From Schedule Version 6

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time		
39	TOC	MB3	0.0000 ppm	0.0000 ppm	0.0000%	2019/08/14 21:28		
Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	4.97	8.33	3.36	50.10	10:32
<u>Dilution</u>		<u>Blank Contribution</u>		<u>Method</u>	<u>Calibration</u>			

1:10 (TC) 8.7794 (IC) CAS_salt_010711 CAS_salt_010711
(v1284) (v4) (v30)

Sample Type: Check Standard --> LCS

From Schedule Version 6

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◊ C	TOC	25.0000	1:1	[TOC] LCS [25.0 ppm]	0 / infinity (NA / NA)	25.0172 ppm (PASS)	0.0000 ppm	0%	2019/08/14 21:43

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	25.0172	250.1724	179.28	182.63	3.36	50.11	10:33

Completion State Success - Criteria met.
Success Action Do Nothing
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)
STD Conc - Pos C 25 ppmC

Sample Type: Sample

From Schedule Version 6

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◊ 40	TOC	T1901331-006.05 doc	0.5444 ppm	0.0344 ppm	6.3100%	2019/08/14 21:57

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.5687	5.6874	12.64	16.22	3.58	50.17	10:27
2	TOC	0.5201	5.2012	12.31	15.65	3.34	50.17	10:28

Dilution 1:10
Blank Contribution (TC) 8.7794 (IC) (v1284)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◊ 41	TOC	T1901331-007.05 doc	2.8722 ppm	0.0204 ppm	0.7100%	2019/08/14 22:25

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.8578	28.5780	28.18	31.63	3.46	50.19	10:25
2	TOC	2.8867	28.8667	28.37	31.83	3.45	50.22	10:26

Dilution 1:10
Blank Contribution (TC) 8.7794 (IC) (v1284)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◊ 42	TOC	T1901331-008.05 doc	3.2852 ppm	0.0006 ppm	0.0200%	2019/08/14 22:53

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.2856	32.8561	31.08	34.41	3.32	50.24	10:29
2	TOC	3.2847	32.8473	31.08	34.33	3.25	50.25	10:27

Dilution 1:10 **Blank Contribution** (TC) 8.7794 (IC) (v1284) **Method** CAS_salt_010711 (v4) **Calibration** CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
43	TOC	T1901331-009.05 doc	3.8142 ppm	0.0063 ppm	0.1600%	2019/08/14 23:21

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.8098	38.0978	34.64	37.97	3.33	50.26	10:24
2	TOC	3.8186	38.1862	34.70	37.89	3.19	50.27	10:25

Dilution 1:10 **Blank Contribution** (TC) 8.7794 (IC) (v1284) **Method** CAS_salt_010711 (v4) **Calibration** CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
44	TOC	T1901331-010.05 doc	0.5024 ppm	0.0078 ppm	1.5600%	2019/08/14 23:49

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.4968	4.9685	12.15	15.45	3.29	50.27	10:26
2	TOC	0.5079	5.0789	12.23	15.63	3.40	50.29	10:27

Dilution 1:10 **Blank Contribution** (TC) 8.7794 (IC) (v1284) **Method** CAS_salt_010711 (v4) **Calibration** CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
45	TOC	T1901331-011.05 doc	0.6490 ppm	0.0176 ppm	2.7100%	2019/08/15 00:17

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.6365	6.3651	13.10	16.55	3.45	50.32	10:27
2	TOC	0.6614	6.6140	13.27	16.55	3.28	50.32	10:29

Dilution 1:10 **Blank Contribution** (TC) 8.7794 (IC) (v1284) **Method** CAS_salt_010711 (v4) **Calibration** CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
46	TOC	T1901331-012.05 doc	1.1911 ppm	0.0676 ppm	5.6800%	2019/08/15 00:45

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.2389	12.3890	17.19	20.61	3.42	50.32	10:31
2	TOC	1.1433	11.4329	16.54	19.94	3.40	50.34	10:26

Dilution 1:10 **Blank Contribution** (TC) 8.7794 (IC) (v1284) **Method** CAS_salt_010711 (v4) **Calibration** CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
47	TOC	T1901331-013.05 doc	4.4992 ppm	0.0095 ppm	0.2100%	2019/08/15 01:14

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.5059	45.0587	39.36	42.76	3.40	50.37	10:26
2	TOC	4.4925	44.9246	39.27	42.64	3.37	50.37	10:24
<u>Dilution</u>		<u>Blank Contribution</u>		<u>Method</u>	<u>Calibration</u>			
1:10		(TC) 8.7794 (IC) (v1284)		CAS_salt_010711 (v4)	CAS_salt_010711 (v30)			

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 6

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time	
◊ B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	23.6803 ppm (PASS)	0.0000 ppm	0%	2019/08/15 01:42	
Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	23.6803	236.8031	170.20	173.51	3.30	50.39	10:32
<u>Completion State</u>		<u>Success Action</u>		<u>Method</u>	<u>Calibration</u>	<u>STD Conc - Pos B</u>				
Success - Criteria met.		Do Nothing		CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	50 ppmC				

Sample Type: Check Standard --> CCB From Schedule Version 6

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time	
◊ D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/08/15 01:56	
Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	5.42	8.69	3.27	50.40	10:29
<u>Completion State</u>		<u>Success Action</u>		<u>Method</u>	<u>Calibration</u>	<u>STD Conc - Pos D</u>				
Success - Criteria met.		Do Nothing		CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	0 ppmC				

Sample Type: Sample From Schedule Version 6

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time		
◊ 48	TOC	T1901331-014.05 doc	4.6869 ppm	0.0233 ppm	0.5000%	2019/08/15 02:11		
Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.7034	47.0342	40.71	43.91	3.20	50.40	10:28
2	TOC	4.6704	46.7042	40.48	43.80	3.31	50.42	10:26
<u>Dilution</u>		<u>Blank Contribution</u>		<u>Method</u>	<u>Calibration</u>			

1:10 (TC) 8.7794 (IC) CAS_salt_010711 CAS_salt_010711
(v1284) (v4) (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
49	TOC	T1901331-015.05 doc	4.9758 ppm	0.0229 ppm	0.4600%	2019/08/15 02:39

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.9920	49.9202	42.66	45.94	3.27	50.43	10:28
2	TOC	4.9596	49.5961	42.44	45.69	3.24	50.45	10:26

Dilution 1:10 Blank Contribution (TC) 8.7794 (IC) (v1284) Method CAS_salt_010711 (v4) Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
50	TOC	T1901331-016.05 doc	1.6777 ppm	0.1103 ppm	6.5800%	2019/08/15 03:07

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.7557	17.5570	20.70	23.96	3.26	50.44	10:29
2	TOC	1.5997	15.9968	19.64	23.19	3.55	50.45	10:27

Dilution 1:10 Blank Contribution (TC) 8.7794 (IC) (v1284) Method CAS_salt_010711 (v4) Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
51	TOC	T1901331-017.05 doc	1.7142 ppm	0.0704 ppm	4.1100%	2019/08/15 03:35

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.7639	17.6395	20.75	24.05	3.29	50.46	10:27
2	TOC	1.6644	16.6436	20.08	23.29	3.21	50.48	10:32

Dilution 1:10 Blank Contribution (TC) 8.7794 (IC) (v1284) Method CAS_salt_010711 (v4) Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
52	TOC	T1901331-018.05 doc	3.8977 ppm	0.0135 ppm	0.3500%	2019/08/15 04:03

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.9073	39.0731	35.30	38.62	3.32	50.49	10:25
2	TOC	3.8882	38.8815	35.17	38.59	3.41	50.49	10:27

Dilution 1:10 Blank Contribution (TC) 8.7794 (IC) (v1284) Method CAS_salt_010711 (v4) Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
53	TOC	T1901331-019.05 doc	5.1501 ppm	0.0013 ppm	0.0200%	2019/08/15 04:31

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	5.1510	51.5098	43.74	47.17	3.42	50.51	10:26
2	TOC	5.1492	51.4921	43.73	47.21	3.47	50.50	10:24

Dilution 1:10
Blank Contribution (TC) 8.7794 (IC) (v1284)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
54	TOC	T1901331-020.05 doc	5.1889 ppm	0.0324 ppm	0.6200%	2019/08/15 04:59

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	5.2118	52.1183	44.16	47.36	3.20	50.53	10:31
2	TOC	5.1660	51.6601	43.85	47.11	3.26	50.53	10:26

Dilution 1:10
Blank Contribution (TC) 8.7794 (IC) (v1284)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
55	TOC	T1901331-021.05 doc	5.1566 ppm	0.0479 ppm	0.9300%	2019/08/15 05:27

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	5.1905	51.9046	44.01	47.13	3.12	50.54	10:27
2	TOC	5.1227	51.2270	43.55	46.79	3.24	50.55	10:27

Dilution 1:10
Blank Contribution (TC) 8.7794 (IC) (v1284)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
56	TOC	T1901331-021.05 ms doc	30.7948 ppm	0.0000 ppm	0.0000%	2019/08/15 05:55

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	30.7948	307.9484	217.81	221.21	3.39	50.58	10:31

Dilution 1:10
Blank Contribution (TC) 8.7794 (IC) (v1284)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
57	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2019/08/15 06:10

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.07	9.27	3.20	50.55	10:33

Dilution 1:10
Blank Contribution (TC) 8.7794 (IC) (v1284)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 6

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
♦ B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	23.2691 ppm (PASS)	0.0000 ppm	0%	2019/08/15 06:25

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	23.2691	232.6914	167.41	170.70	3.29	50.55	10:29

Completion State Success - Criteria met. **Success Action** Do Nothing **Method** CAS_salt_010711 (v4) **Calibration** CAS_salt_010711 (v30) **STD Conc - Pos B** 50 ppmC

Sample Type: Check Standard --> CCB From Schedule Version 6

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
♦ D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/08/15 06:40

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	5.14	8.39	3.25	50.59	10:32

Completion State Success - Criteria met. **Success Action** Do Nothing **Method** CAS_salt_010711 (v4) **Calibration** CAS_salt_010711 (v30) **STD Conc - Pos D** 0 ppmC

Sample Type: Sample From Schedule Version 6

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
♦ 58	TOC	MB4	0.0000 ppm	0.0000 ppm	0.0000%	2019/08/15 06:54

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	4.38	7.65	3.27	50.57	10:31

Dilution 1:10 **Blank Contribution** (TC) 8.7794 (IC) (v1284) **Method** CAS_salt_010711 (v4) **Calibration** CAS_salt_010711 (v30)

Sample Type: Check Standard --> LCS From Schedule Version 6

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
♦ C	TOC	25.0000	1:1	[TOC] LCS [25.0 ppm]	0 / infinity (NA / NA)	24.5197 ppm (PASS)	0.0000 ppm	0%	2019/08/15 07:09

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	24.5197	245.1974	175.90	179.22	3.32	50.57	10:32

Completion State Success - Criteria met.
Success Action Do Nothing
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)
STD Conc - Pos C 25 ppmC

Sample Type: Sample

From Schedule Version 6

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
59	TOC	T1901331-022.05 doc	4.3889 ppm	0.0300 ppm	0.6800%	2019/08/15 07:24

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.4101	44.1011	38.71	42.04	3.33	50.56	10:27
2	TOC	4.3677	43.6768	38.43	41.65	3.22	50.58	10:27

Dilution 1:10
Blank Contribution (TC) 8.7794 (IC) (v1284)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
60	TOC	T1901331-023.05 doc	5.0732 ppm	0.0017 ppm	0.0300%	2019/08/15 07:52

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	5.0744	50.7438	43.22	46.64	3.42	50.58	10:28
2	TOC	5.0720	50.7202	43.21	46.59	3.39	50.58	10:25

Dilution 1:10
Blank Contribution (TC) 8.7794 (IC) (v1284)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
61	TOC	T1901331-024.05 doc	5.1299 ppm	0.0827 ppm	1.6100%	2019/08/15 08:20

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	5.1884	51.8840	44.00	47.25	3.25	50.53	10:30
2	TOC	5.0714	50.7143	43.20	46.65	3.44	50.53	10:30

Dilution 1:10
Blank Contribution (TC) 8.7794 (IC) (v1284)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
62	TOC	T1901331-025.05 doc	5.1841 ppm	0.0073 ppm	0.1400%	2019/08/15 08:48

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	5.1790	51.7897	43.93	47.30	3.37	50.52	10:29
2	TOC	5.1893	51.8929	44.00	47.41	3.41	50.53	10:29

Dilution 1:10 **Blank Contribution** (TC) 8.7794 (IC) (v1284) **Method** CAS_salt_010711 (v4) **Calibration** CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
63	TOC	T1901331-026.05 doc	5.1189 ppm	0.0020 ppm	0.0400%	2019/08/15 09:16

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	5.1203	51.2034	43.54	46.84	3.31	50.55	10:25
2	TOC	5.1175	51.1754	43.52	46.68	3.16	50.52	10:27

Dilution 1:10 **Blank Contribution** (TC) 8.7794 (IC) (v1284) **Method** CAS_salt_010711 (v4) **Calibration** CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
64	TOC	T1901331-027.05 doc	5.1991 ppm	0.0193 ppm	0.3700%	2019/08/15 09:44

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	5.1855	51.8545	43.98	47.28	3.30	50.50	10:24
2	TOC	5.2127	52.1271	44.16	47.29	3.13	50.48	10:26

Dilution 1:10 **Blank Contribution** (TC) 8.7794 (IC) (v1284) **Method** CAS_salt_010711 (v4) **Calibration** CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
65	TOC	T1901331-028.05 doc	5.0031 ppm	0.0497 ppm	0.9900%	2019/08/15 10:12

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	5.0383	50.3828	42.98	46.46	3.48	50.46	10:27
2	TOC	4.9680	49.6801	42.50	45.88	3.38	50.45	10:25

Dilution 1:10 **Blank Contribution** (TC) 8.7794 (IC) (v1284) **Method** CAS_salt_010711 (v4) **Calibration** CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
66	TOC	T1901331-029.05 doc	5.1780 ppm	0.0605 ppm	1.1700%	2019/08/15 10:40

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	5.2208	52.2081	44.22	47.44	3.22	50.41	10:29
2	TOC	5.1352	51.3522	43.64	46.85	3.21	50.41	10:27

Dilution 1:10 **Blank Contribution** (TC) 8.7794 (IC) (v1284) **Method** CAS_salt_010711 (v4) **Calibration** CAS_salt_010711 (v30)

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◊ B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	23.4380 ppm (PASS)	0.0000 ppm	0%	2019/08/15 11:09

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	23.4380	234.3796	168.56	172.00	3.44	50.39	10:32

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	50 ppmC

Sample Type: Check Standard --> CCB From Schedule Version 6

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◊ D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/08/15 11:23

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	5.47	8.71	3.24	50.37	10:34

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	0 ppmC

Sample Type: Sample From Schedule Version 6

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◊ 67	TOC	T1901331-030.05 doc	5.1021 ppm	0.0145 ppm	0.2800%	2019/08/15 11:38

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	5.0919	50.9191	43.34	46.63	3.28	50.36	10:31
2	TOC	5.1124	51.1238	43.48	46.75	3.27	50.34	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7794 (IC) (v1284)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◊ 68	TOC	T1901331-031.05 doc	4.5003 ppm	0.0581 ppm	1.2900%	2019/08/15 12:06

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.5414	45.4137	39.61	42.86	3.26	50.34	10:30
2	TOC	4.4592	44.5917	39.05	42.37	3.32	50.34	10:32

Dilution	Blank Contribution	Method	Calibration

1:10 (TC) 8.7794 (IC) CAS_salt_010711 CAS_salt_010711
(v1284) (v4) (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
69	TOC	T1901331-032.05 doc	5.1514 ppm	0.0389 ppm	0.7500%	2019/08/15 12:34

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	5.1239	51.2387	43.56	46.85	3.29	50.35	10:27
2	TOC	5.1788	51.7883	43.93	47.22	3.28	50.29	10:28

Dilution 1:10 Blank Contribution (TC) 8.7794 (IC) (v1284) Method CAS_salt_010711 (v4) Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
70	TOC	T1901331-033.05 doc	5.1841 ppm	0.0515 ppm	0.9900%	2019/08/15 13:03

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	5.2205	52.2052	44.22	47.42	3.21	50.33	10:29
2	TOC	5.1477	51.4774	43.72	47.01	3.29	50.29	10:25

Dilution 1:10 Blank Contribution (TC) 8.7794 (IC) (v1284) Method CAS_salt_010711 (v4) Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
71	TOC	T1901331-034.05 doc	4.2682 ppm	0.0058 ppm	0.1400%	2019/08/15 13:31

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.2641	42.6411	37.72	40.96	3.24	50.33	10:29
2	TOC	4.2724	42.7236	37.78	41.14	3.36	50.33	10:31

Dilution 1:10 Blank Contribution (TC) 8.7794 (IC) (v1284) Method CAS_salt_010711 (v4) Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
72	TOC	T1901331-035.05 doc	2.7757 ppm	0.0778 ppm	2.8000%	2019/08/15 13:59

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.8307	28.3069	27.99	31.31	3.32	50.30	10:28
2	TOC	2.7206	27.2064	27.25	30.49	3.25	50.32	10:27

Dilution 1:10 Blank Contribution (TC) 8.7794 (IC) (v1284) Method CAS_salt_010711 (v4) Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
73	TOC	T1901331-036.05 doc	3.8678 ppm	0.0002 ppm	0.0100%	2019/08/15 14:27

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.8680	38.6797	35.04	38.23	3.19	50.37	10:27
2	TOC	3.8677	38.6768	35.03	38.37	3.34	50.32	10:28

Dilution 1:10
Blank Contribution (TC) 8.7794 (IC) (v1284)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
74	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2019/08/15 14:55

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	5.17	8.44	3.27	50.34	10:29
2	TOC	0.0000	0.0000	6.35	9.64	3.29	50.37	10:29

Dilution 1:10
Blank Contribution (TC) 8.7794 (IC) (v1284)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
75	TOC	Lot check 190516	0.0000 ppm	0.0000 ppm	0.0000%	2019/08/15 15:23

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	4.71	8.03	3.32	50.36	10:28
2	TOC	0.0000	0.0000	4.58	8.12	3.54	50.34	10:25

Dilution 1:10
Blank Contribution (TC) 8.7794 (IC) (v1284)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm

From Schedule Version 6

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	23.4044 ppm (PASS)	0.0000 ppm	0%	2019/08/15 15:51

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	23.4044	234.0438	168.33	171.56	3.23	50.36	10:30

Completion State Success - Criteria met.
Success Action Do Nothing
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)
STD Conc - Pos B 50 ppmC

Sample Type: Check Standard --> CCB

From Schedule Version 6

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
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◆	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/08/15 16:06
Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	5.19	8.61	3.42	50.37	10:31
Completion State		Success Action		Method		Calibration		STD Conc - Pos D		
Success - Criteria met.		Do Nothing		CAS_salt_010711 (v4)		CAS_salt_010711 (v30)		0 ppmC		

Meta Data Used in this Report

Blanks

Version	Reagent (Abs)	Acid (Abs)	DI IC (Abs)	DI TC (Abs)	DI TOC (Abs)	Save Time	Operator
v1283	2.0090	1.4730	0.0000	0.0000	0.0000	2019/08/08 17:50	Fusion1 (Fusion1)
v1284	1.3160	1.4350	0.0000	0.0000	0.0000	2019/08/13 19:38	Fusion1 (Fusion1)

Calibrations

Name: CAS_salt_010711 (TOC)

Version: v30 Calibration curve formula: TOC: $y = 6.788x + 9.463$

Ver Creation: 2019/03/05 17:42 r^2 value: TOC: $r^2 = 0.99963$

Comment:

Operator: Fusion1 (Fusion1)

Basic Analysis Type: TOC

Basic Analysis Type: TOC

Sample ID	Y Raw Value	X Expected	Message	End Time
DI Water	7.8970	0.0000		2019/03/05 16:15
0.500 ppm	11.5280	0.5000		2019/03/05 16:29
1.0 ppm	14.9760	1.0000		2019/03/05 16:44
5.0 ppm	43.6500	5.0000		2019/03/05 16:58
10 ppm	79.6020	10.0000		2019/03/05 17:12
25 ppm	183.3580	25.0000		2019/03/05 17:26
50 ppm	346.3230	50.0000		2019/03/05 17:40

Methods

Name: CAS_salt_010711 (TOC)

Version: v4 Operator: Fusion1 (Fusion1)
 Ver Creation: 2019/02/21 17:57
 Comment:

Parameter	Value	Advanced Parameter	Value
SampleVolume	10.0 mL	NeedleRinseVolume	5.0 ml
Dilution	1:10	VialPrimeVolume	2.0 ml
AcidVolume	0.5 ml	ICSamplePrimeVolume	2.0 ml
ReagentVolume	2.0 ml	ICSpurgeRinseVolume	12.0 ml
UVReactorPrerinse	Off	BaselineStabilizeTime	0.70 min
UVReactorPrerinseVolume	5.0	DetectorPressureFlow	150 ml/min
NumberOfUVReactorPrerinses	1	SyringeSpeedWaste	10
ICSpurgeTime	1.00 mins	SyringeSpeedAcid	7
DetectorSweepFlow	500 ml/min	SyringeSpeedReagent	7
PreSpurgeTime	2.00 mins	SyringeSpeedDIWater	7
SystemFlow	500 ml/min	NDIRPressurization	60 psig
		SyringeSpeedSampleDispense	5
		SyringeSpeedSampleAspirate	4
		SyringeSpeedUVDispense	5
		SyringeSpeedUVAspirate	5
		SyringeSpeedICDispense	5
		SyringeSpeedICAspirate	5
		NDIRPressureStabilize	1.75 min
		SampleMixing	Off
		SampleMixingCycles	1
		SampleMixingVolume	10.0
		LowLevelFilterNDIR	Off

Acceptance / Approval

Electronic Signatures

Report Version	User Name	Acceptance	Reason	Date

Report History

Report History

Report Version	User Name	System Reason	User Reason	Date
1	Fusion1 (Fusion1)	Schedule completed	Schedule completed	2019/08/15 16:24



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LABORATORY REPORT

August 20, 2019

RJ Modashia
ALS Laboratory Group
10450 Stancliff Road Suite 210
Houston, TX 77099-4338

RE: HS19080285

Dear RJ:

Enclosed are the results of the samples submitted to our laboratory on August 8, 2019. For your reference, these analyses have been assigned our service request number P1904717.

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 1:29 pm, Aug 20, 2019

Hayden Akers
Project Manager



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

Client: ALS Laboratory Group
 Project: HS19080285

Service Request No: P1904717

CASE NARRATIVE

The samples were received intact under chain of custody on August 8, 2019 and were stored in accordance with the analytical method requirements. Please refer to the sample acceptance check form for additional information. The results reported herein are applicable only to the condition of the samples at the time of sample receipt.

Carbon Dioxide Analysis

The samples were analyzed for carbon dioxide using a gas chromatograph equipped with a thermal conductivity detector (TCD). A known amount of liquid was displaced by injecting 8.0 milliliters of helium creating a headspace in the sample vial. Each sample vial was agitated using a sonic disrupter for fifteen minutes and then allowed to equilibrate for at least four hours. A volume of the headspace was withdrawn using a gas-tight syringe and analyzed using a manual injection technique. The amount of dissolved gases (carbon dioxide) in the original sample was calculated using Henry's Law. This method was performed with guidance from RSK 175 as described in laboratory SOP VOA-DISGAS. This analyte is included on the laboratory's NELAP and DoD-ELAP scope of accreditation.

Methane, Ethene and Ethane Analysis

The samples were also analyzed for methane, ethene and ethane using a gas chromatograph equipped with a flame ionization detector (FID). A known amount of liquid was displaced by injecting 8.0 milliliters of helium creating a headspace in the sample vial. Each sample vial was agitated using a sonic disrupter for fifteen minutes and then allowed to equilibrate for at least two hours. A volume of the headspace was withdrawn using a gas-tight syringe and analyzed using a manual injection technique. The amount of dissolved gases (methane, ethene and ethane) in the original sample was calculated using Henry's Law. This method was performed with guidance from RSK 175. This method is included on the laboratory's NELAP and DoD-ELAP scope of accreditation. Any analytes flagged with an X are not included on the laboratory's NELAP or DoD-ELAP accreditation.

The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and ALS Environmental (ALS) is not responsible for utilization of less than the complete report.

Use of ALS Environmental (ALS)'s Name. Client shall not use ALS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to ALS any test result, tolerance or specification derived from ALS's data ("Attribution") without ALS's prior written consent, which may be withheld by ALS for any reason in its sole discretion. To request ALS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If ALS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use ALS's name or trademark in any Materials or Attribution shall be deemed denied. ALS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of ALS's name or trademark may cause ALS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.



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ALS Environmental – Simi Valley

CERTIFICATIONS, ACCREDITATIONS, AND REGISTRATIONS

Agency	Web Site	Number
Alaska DEC	http://dec.alaska.gov/eh/lab.aspx	17-019
Arizona DHS	http://www.azdhs.gov/preparedness/state-laboratory/lab-licensure-certification/index.php#laboratory-licensure-home	AZ0694
Florida DOH (NELAP)	http://www.floridahealth.gov/licensing-and-regulation/environmental-laboratories/index.html	E871020
Louisiana DEQ (NELAP)	http://www.deq.louisiana.gov/page/la-lab-accreditation	05071
Maine DHHS	http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/professionals/labCert.shtml	2018027
Minnesota DOH (NELAP)	http://www.health.state.mn.us/accreditation	1521096
New Jersey DEP (NELAP)	http://www.nj.gov/dep/enforcement/oqa.html	CA009
New York DOH (NELAP)	http://www.wadsworth.org/labcert/elap/elap.html	11221
Oregon PHD (NELAP)	http://www.oregon.gov/oha/ph/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	4068-006
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	CA01627201 9-10
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 Laboratory Group
 Project ID: HS19080285

Service Request: P1904717

Date Received: 8/8/2019
 Time Received: 09:10

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	RSK 175 - CO2	RSK 175 - Gases
35BWW26-190806	P1904717-001	Water	8/6/2019	10:25	X	X
35BWW14-190806	P1904717-002	Water	8/6/2019	11:25	X	X
35BWW23-190806	P1904717-003	Water	8/6/2019	12:20	X	X



P1904717

10450 Stancliff Rd, Ste 210
Houston, TX 77099
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Subcontract Chain of Custody

SAMPLING STATE: Texas

COC ID: 11930

SUBCONTRACT TO:

ALS Environmental
2655 Park Center Drive, Suite A
Simi Valley, CA 93065

Phone: +1 805 526 7161

CUSTOMER INFORMATION:

Company: ALS Houston
Contact: RJ Modashia
Address: 10450 Stancliff Rd, Ste 210
Phone: +1 281 530 5656
Email: RJ.Modashia@alsglobal.com
Alternate Contact: Jumoke M. Lawal
Email: jumoke.lawal@alsglobal.com

INVOICE INFORMATION:

Company: ALS Houston
Contact: Accounts Payable
Address: 10450 Stancliff Rd, Ste 210
Phone: +1 281 530 5656
Reference: HS19080285
TSR: Sonia West

LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
ANALYSIS REQUESTED			DUE DATE
1. HS19080285-05	35BWW26-190806	Groundwater	06 Aug 2019 10:25
MEE + CO2. DOD IV. Equis EDD. EQUIS 5.0 - Longhorn			21 Aug 2019
2. HS19080285-06	35BWW14-190806	Groundwater	06 Aug 2019 11:25
MEE + CO2. DOD IV. Equis EDD. EQUIS 5.0 - Longhorn			21 Aug 2019
3. HS19080285-07	35BWW23-190806	Groundwater	06 Aug 2019 12:20
MEE + CO2. DOD IV. Equis EDD. EQUIS 5.0 - Longhorn			21 Aug 2019

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

QC Level: DOD IV (DoD Data Package)

Relinquished By: [Signature]
Received By: [Signature]
Cooler ID(s): _____

Date/Time: 8/7/19 1800
Date/Time: 8/8/19 0910 1°C
Temperature(s): _____ uBT

ALS Environmental
Sample Acceptance Check Form

Client: ALS Laboratory Group Work order: P1904717
 Project: HS19080285
 Sample(s) received on: 8/8/19 Date opened: 8/8/19 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? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2 Did sample containers arrive in good condition? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 3 Were chain-of-custody papers used and filled out? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 4 Did sample container labels and/or tags agree with custody papers? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 5 Was sample volume received adequate for analysis? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 6 Are samples within specified holding times? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 7 Was proper temperature (thermal preservation) of cooler at receipt adhered to? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Cooler Temperature: 1° C Blank Temperature: ° C Thermometer ID T-111 Wet Ice | | | |
| 8 Were custody seals on outside of cooler/Box/Container? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Location of seal(s)? <u>Cooler lid.</u> Sealing Lid? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Were signature and date included? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Were seals intact? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 9 Do containers have appropriate preservation , according to method/SOP or Client specified information? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Is there a client indication that the submitted samples are pH preserved? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Were VOA vials checked for presence/absence of air bubbles? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Does the client/method/SOP require that the analyst check the sample pH and <u>if necessary</u> alter it? | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 10 Tubes: Are the tubes capped and intact? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 11 Badges: Are the badges properly capped and intact? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Are dual bed badges separated and individually capped and intact? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P1904717-001.01	40mL VOA NP		7		A	wh 8/13/19
P1904717-001.02	40mL VOA NP				A	
P1904717-001.03	40mL VOA NP				A	
P1904717-001.04	40ml VOA HCL		1		A	wh 8/14/19
P1904717-001.05	40ml VOA HCL				A	
P1904717-001.06	40ml VOA HCL				A	
P1904717-002.01	40mL VOA NP		7		A	wh 8/13/19
P1904717-002.02	40mL VOA NP				A	
P1904717-002.03	40mL VOA NP				A	
P1904717-002.04	40ml VOA HCL		1		A	wh 8/14/19
P1904717-002.05	40ml VOA HCL				A	
P1904717-002.06	40ml VOA HCL				A	
P1904717-003.01	40mL VOA NP		7		A	wh 8/13/19
P1904717-003.02	40mL VOA NP				A	
P1904717-003.03	40mL VOA NP				A	

Explain any discrepancies: (include lab sample ID numbers): _____

ALS Environmental
Sample Acceptance Check Form

Client: ALS Laboratory Group Work order: P1904717
Project: HS19080285
Sample(s) received on: 8/8/19 Date opened: 8/8/19 by: ADAVID

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P1904717-003.04	40ml VOA HCL		1		A	wh 8/14/19
P1904717-003.05	40ml VOA HCL				A	
P1904717-003.06	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

Page 1 of 1

Client: ALS Laboratory Group
Client Project ID: HS19080285

ALS Project ID: P1904717

Carbon Dioxide

Test Code: RSK 175
Instrument ID: HP5890A/GC10/TCD
Analyst: Wade Henton
Matrix: Water
Test Notes:

Date(s) Collected: 8/6/19
Date Received: 8/8/19
Date Analyzed: 8/13/19

Client Sample ID	ALS Sample ID	Injection Volume ml(s)	Result µg/L	LOQ µg/L	LOD µg/L	MDL µg/L	Data Qualifier
35BWW26-190806	P1904717-001	0.10	140,000	1,000	860	370	
35BWW14-190806	P1904717-002	0.10	42,000	1,000	860	370	
35BWW23-190806	P1904717-003	0.10	73,000	1,000	860	370	
Method Control Sample	P190813-MB	0.10	860	1,000	860	370	U

The Method Control Sample is laboratory water carried through the entire analytical process.

U = Compound was analyzed for, but not detected above the laboratory detection limit.

LOQ = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

LABORATORY CONTROL SAMPLE / DUPLICATE LABORATORY CONTROL SAMPLE SUMMARY

Page 1 of 1

Client: ALS Laboratory Group
Client Sample ID: Duplicate Lab Control Sample
Client Project ID: HS19080285

ALS Project ID: P1904717
 ALS Sample ID: P190813-DLCS

Test Code: RSK 175
 Instrument ID: HP5890A/GC10/TCD
 Analyst: Wade Henton
 Matrix: Water
 Test Notes:

Date Collected: NA
 Date Received: NA
 Date Analyzed: 8/13/19
 Volume(s) Analyzed: NA ml(s)

CAS #	Compound	Spike Amount		Result ₁			DOD			Data Qualifier
		LCS / DLCS	LCS	DLCS	% Recovery		Acceptance	RPD	RPD	
		ug/L	ug/L	ug/L	LCS	DLCS	Limits		Limit	
124-38-9	Carbon Dioxide	22,900	19,700	20,000	86	87	80-122	1	12	

₁ = The concentration shown includes a subtraction of the Method Control Sample value, even if the result is less than the MRL.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 1

Client: ALS Laboratory Group
Client Sample ID: 35BWW26-190806
Client Project ID: HS19080285

ALS Project ID: P1904717
 ALS Sample ID: P1904717-001

Test Code: RSK 175
 Instrument ID: HP5890A/GC10/FID
 Analyst: Wade Henton
 Matrix: Water
 Test Notes:

Date Collected: 8/6/19
 Date Received: 8/8/19
 Date Analyzed: 8/14/19
 Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result µg/L	LOQ µg/L	LOD µg/L	MDL µg/L	Data Qualifier
74-82-8	Methane	1.0	1.3	1.0	0.51	U
74-85-1	Ethene	0.55	1.0	0.55	0.24	U
74-84-0	Ethane	0.47	0.60	0.47	0.16	U

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

Page 1 of 1

Client: ALS Laboratory Group
Client Sample ID: 35BWW14-190806
Client Project ID: HS19080285

ALS Project ID: P1904717
 ALS Sample ID: P1904717-002

Test Code: RSK 175
 Instrument ID: HP5890A/GC10/FID
 Analyst: Wade Henton
 Matrix: Water
 Test Notes:

Date Collected: 8/6/19
 Date Received: 8/8/19
 Date Analyzed: 8/14/19
 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	4.6	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

Page 1 of 1

Client: ALS Laboratory Group
Client Sample ID: 35BWW23-190806
Client Project ID: HS19080285

ALS Project ID: P1904717
 ALS Sample ID: P1904717-003

Test Code: RSK 175
 Instrument ID: HP5890A/GC10/FID
 Analyst: Wade Henton
 Matrix: Water
 Test Notes:

Date Collected: 8/6/19
 Date Received: 8/8/19
 Date Analyzed: 8/14/19
 Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result µg/L	LOQ µg/L	LOD µg/L	MDL µg/L	Data Qualifier
74-82-8	Methane	1.0	1.3	1.0	0.51	U
74-85-1	Ethene	0.55	1.0	0.55	0.24	U
74-84-0	Ethane	0.47	0.60	0.47	0.16	U

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

Page 1 of 1

Client: ALS Laboratory Group
Client Sample ID: Method Control Sample
Client Project ID: HS19080285

ALS Project ID: P1904717
 ALS Sample ID: P190814-MB

Test Code: RSK 175
 Instrument ID: HP5890A/GC10/FID
 Analyst: Wade Henton
 Matrix: Water
 Test Notes:

Date Collected: NA
 Date Received: NA
 Date Analyzed: 8/14/19
 Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result µg/L	LOQ µg/L	LOD µg/L	MDL µg/L	Data Qualifier
74-82-8	Methane	1.0	1.3	1.0	0.51	U
74-85-1	Ethene	0.55	1.0	0.55	0.24	U
74-84-0	Ethane	0.47	0.60	0.47	0.16	U

The Method Control Sample is laboratory water carried through the entire analytical process.

U = Compound was analyzed for, but not detected above the laboratory detection limit.

LOQ = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

LABORATORY CONTROL SAMPLE / DUPLICATE LABORATORY CONTROL SAMPLE SUMMARY

Page 1 of 1

Client: ALS Laboratory Group
Client Sample ID: Duplicate Lab Control Sample
Client Project ID: HS19080285

ALS Project ID: P1904717
 ALS Sample ID: P190814-LCS
 P190814-DLCS

Test Code: RSK 175
 Instrument ID: HP5890A/GC10/FID
 Analyst: Wade Henton
 Matrix: Water
 Test Notes:

Date Collected: NA
 Date Received: NA
 Date Analyzed: 8/14/19
 Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Spike Amount	Result ₁		% Recovery		DOD	RPD	RPD	Data
		LCS / DLCS µg/L	LCS µg/L	DLCS µg/L	LCS	DLCS	Acceptance Limits			
74-82-8	Methane	2.52	2.54	2.46	101	98	73-125	3	26	
74-85-1	Ethene	4.40	4.37	4.45	99	101	72-133	2	11	
74-84-0	Ethane	4.72	4.65	4.71	99	100	74-131	1	10	

₁ = The concentration shown includes a subtraction of the Method Control Sample value, even if the result is less than the MRL.

Data Path : J:\GC10\DATA\RSK_FID\2019_08\13CO2\
 Data File : 08131911.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 13-Aug-2019, 14:49:05
 Operator : WH
 Sample : p1904717-001 0.1ml
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Aug 13 15:53:56 2019
 Quant Method : I:\GC10\METHODS\RS082817_CO2.M
 Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 QLast Update : Tue Aug 29 16:13:13 2017
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :

Compound	R.T.	Response	Conc	Units

Target Compounds				
1) Oxygen/Argon	1.967f	1627060	0.342	ppm
2) Carbon monoxide	1.967f	1627060	N.D.	ppm
3) Methane (TCD)	0.000	0	N.D.	ppm
4) Carbon dioxide	6.042	1512783	6444.801	ppm
6) Methane (FID)	0.000	0	N.D.	ppm
7) Ethylene	0.000	0	N.D.	ppm
8) Ethane	0.000	0	N.D.	ppm
9) Propylene	0.000	0	N.D.	ppm
10) Propane	0.000	0	N.D.	ppm
11) Isobutylene	0.000	0	N.D.	ppm
12) Isobutane	0.000	0	N.D.	ppm
13) n-Butane	0.000	0	N.D.	ppm

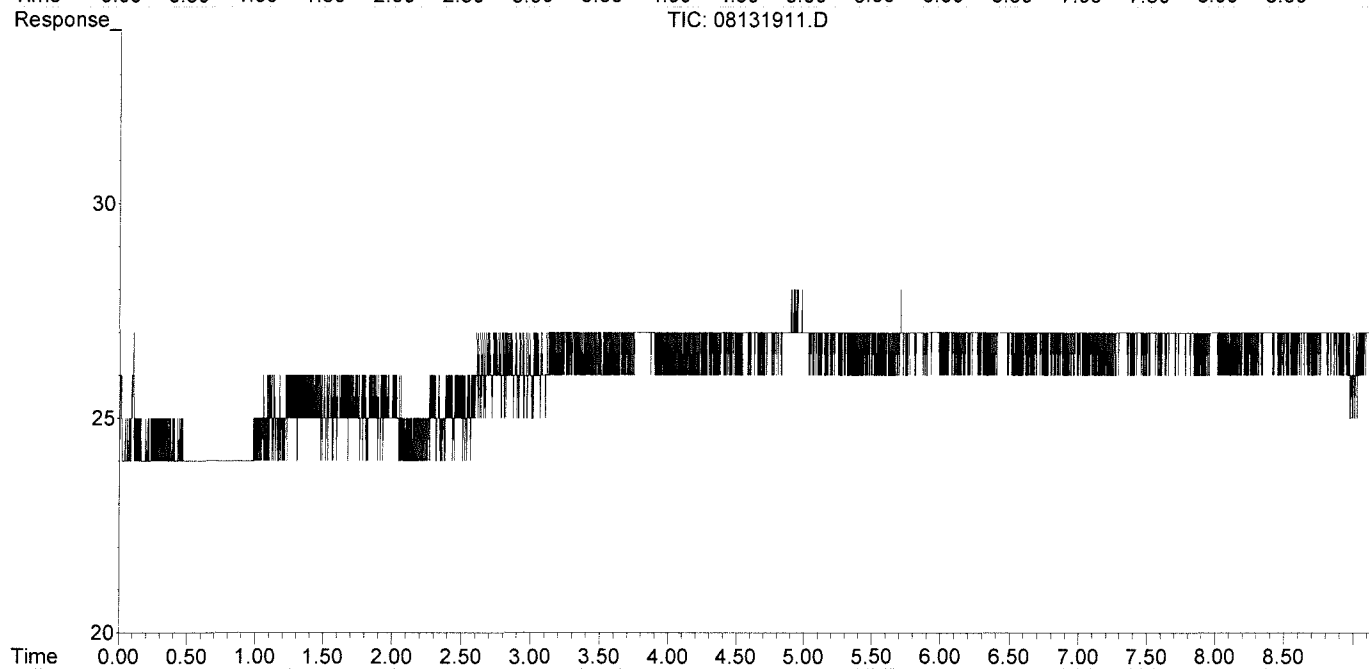
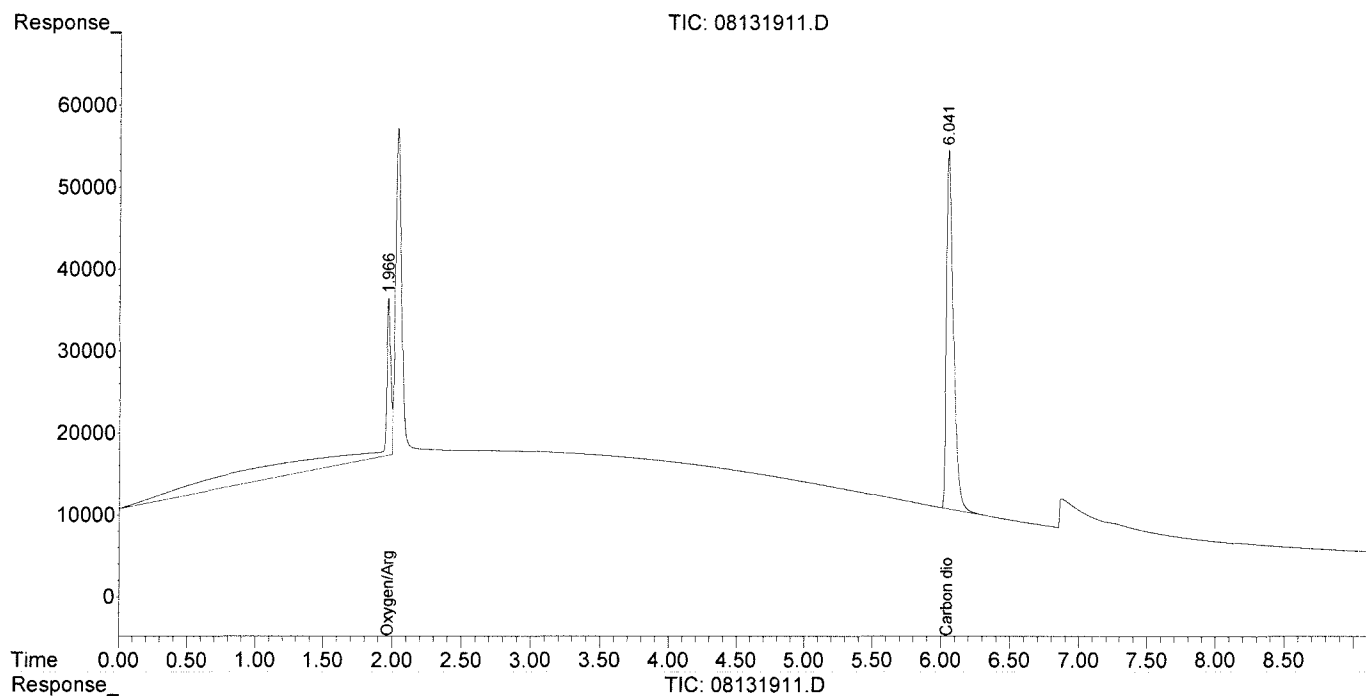
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(m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2019_08\13CO2\
Data File : 08131911.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 13-Aug-2019, 14:49:05
Operator : WH
Sample : p1904717-001 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 13 15:53:56 2019
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-T03C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



Data Path : J:\GC10\DATA\RSK_FID\2019_08\13CO2\
 Data File : 08131912.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 13-Aug-2019, 15:00:41
 Operator : WH
 Sample : p1904717-002 0.1ml
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Aug 13 15:54:05 2019
 Quant Method : I:\GC10\METHODS\RS082817_CO2.M
 Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 QLast Update : Tue Aug 29 16:13:13 2017
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :

Compound	R.T.	Response	Conc	Units

Target Compounds				
1) Oxygen/Argon	1.961f	1682022	0.353	ppm
2) Carbon monoxide	1.961f	1682022	N.D.	ppm
3) Methane (TCD)	0.000	0	N.D.	ppm
4) Carbon dioxide	6.060	446619	1902.701	ppm
6) Methane (FID)	0.000	0	N.D.	ppm
7) Ethylene	0.000	0	N.D.	ppm
8) Ethane	0.000	0	N.D.	ppm
9) Propylene	0.000	0	N.D.	ppm
10) Propane	0.000	0	N.D.	ppm
11) Isobutylene	0.000	0	N.D.	ppm
12) Isobutane	0.000	0	N.D.	ppm
13) n-Butane	0.000	0	N.D.	ppm

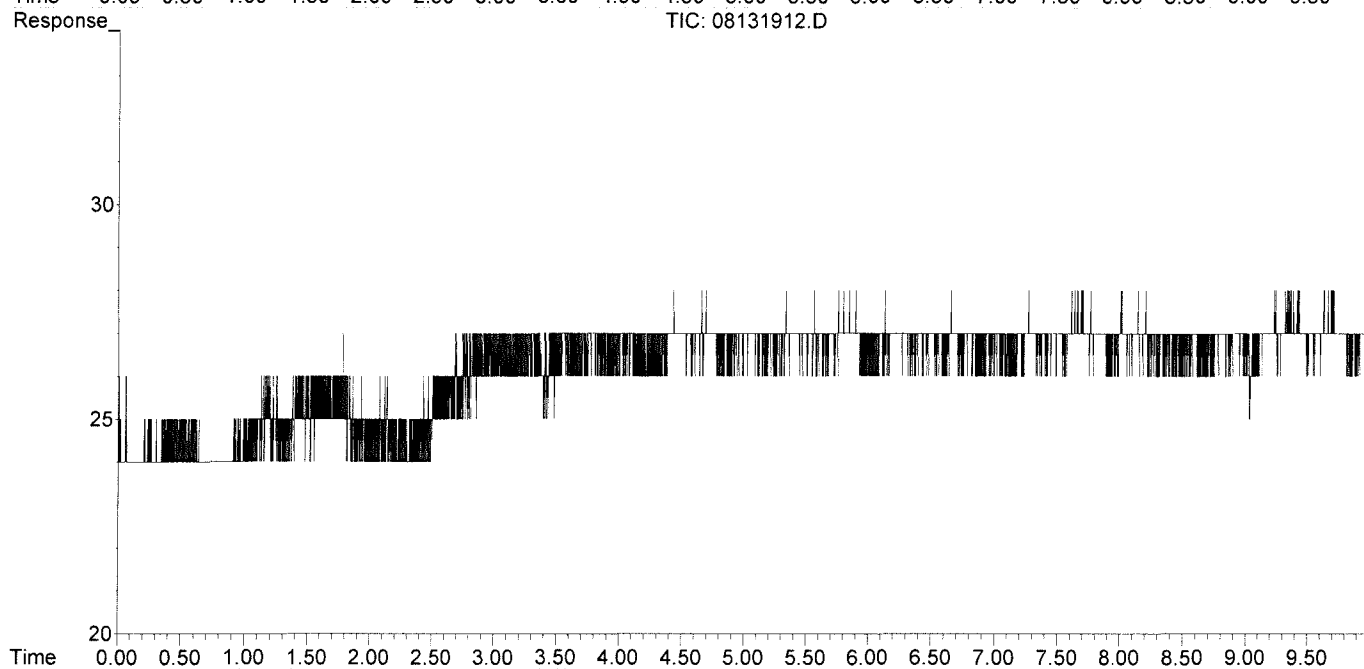
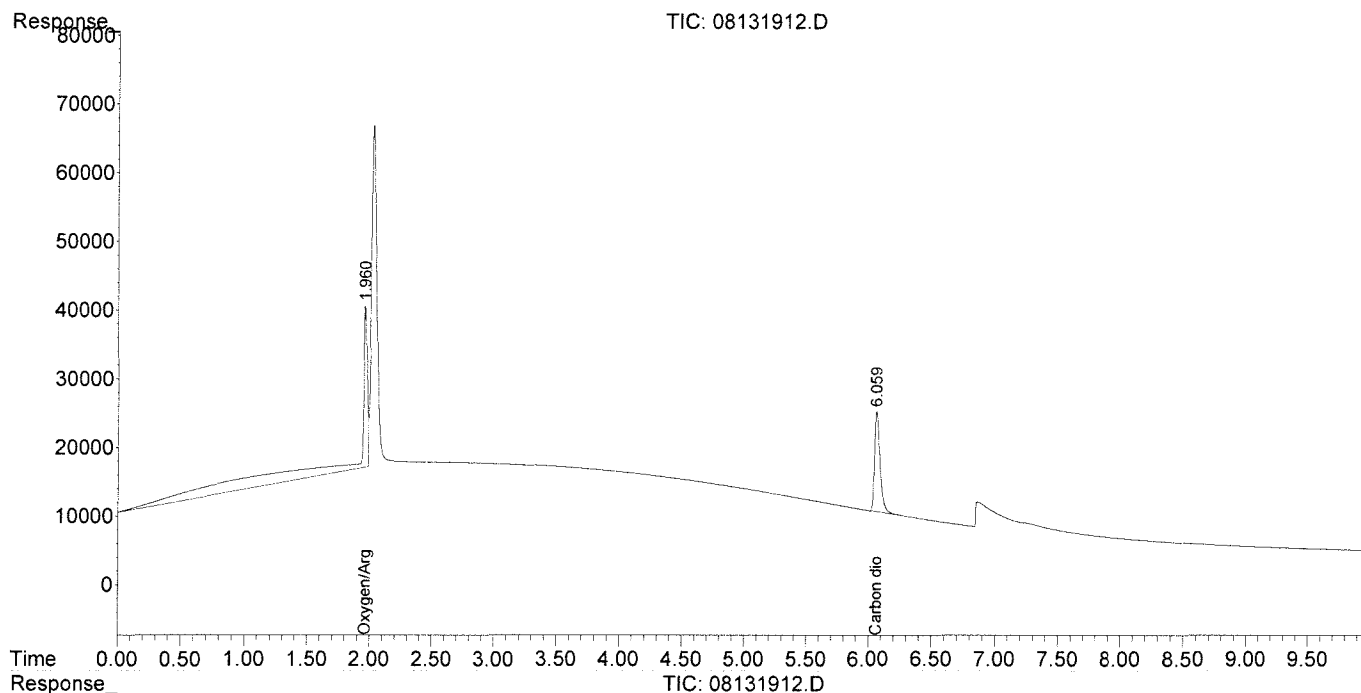
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(m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2019_08\13CO2\
 Data File : 08131912.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 13-Aug-2019, 15:00:41
 Operator : WH
 Sample : p1904717-002 0.1ml
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Aug 13 15:54:05 2019
 Quant Method : I:\GC10\METHODS\RS082817_CO2.M
 Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 QLast Update : Tue Aug 29 16:13:13 2017
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :



Data Path : J:\GC10\DATA\RSK_FID\2019_08\13CO2\
 Data File : 08131913.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 13-Aug-2019, 15:24:57
 Operator : WH
 Sample : p1904717-003 0.1ml
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Aug 13 15:54:19 2019
 Quant Method : I:\GC10\METHODS\RS082817_CO2.M
 Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 QLast Update : Tue Aug 29 16:13:13 2017
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :

Compound	R.T.	Response	Conc	Units

Target Compounds				
1) Oxygen/Argon	1.969f	414831	0.087	ppm
2) Carbon monoxide	1.969f	414831	N.D.	ppm
3) Methane (TCD)	0.000	0	N.D.	ppm
4) Carbon dioxide	6.055	783771	3339.046	ppm
6) Methane (FID)	0.000	0	N.D.	ppm
7) Ethylene	0.000	0	N.D.	ppm
8) Ethane	0.000	0	N.D.	ppm
9) Propylene	0.000	0	N.D.	ppm
10) Propane	0.000	0	N.D.	ppm
11) Isobutylene	0.000	0	N.D.	ppm
12) Isobutane	0.000	0	N.D.	ppm
13) n-Butane	0.000	0	N.D.	ppm

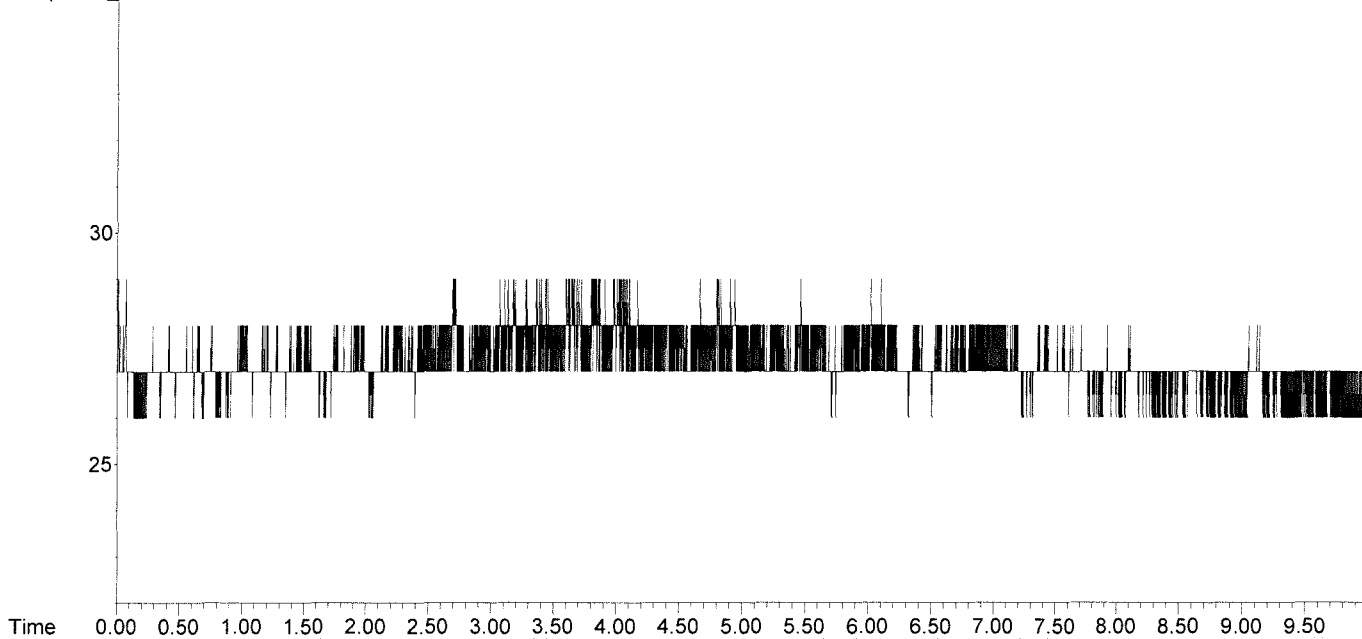
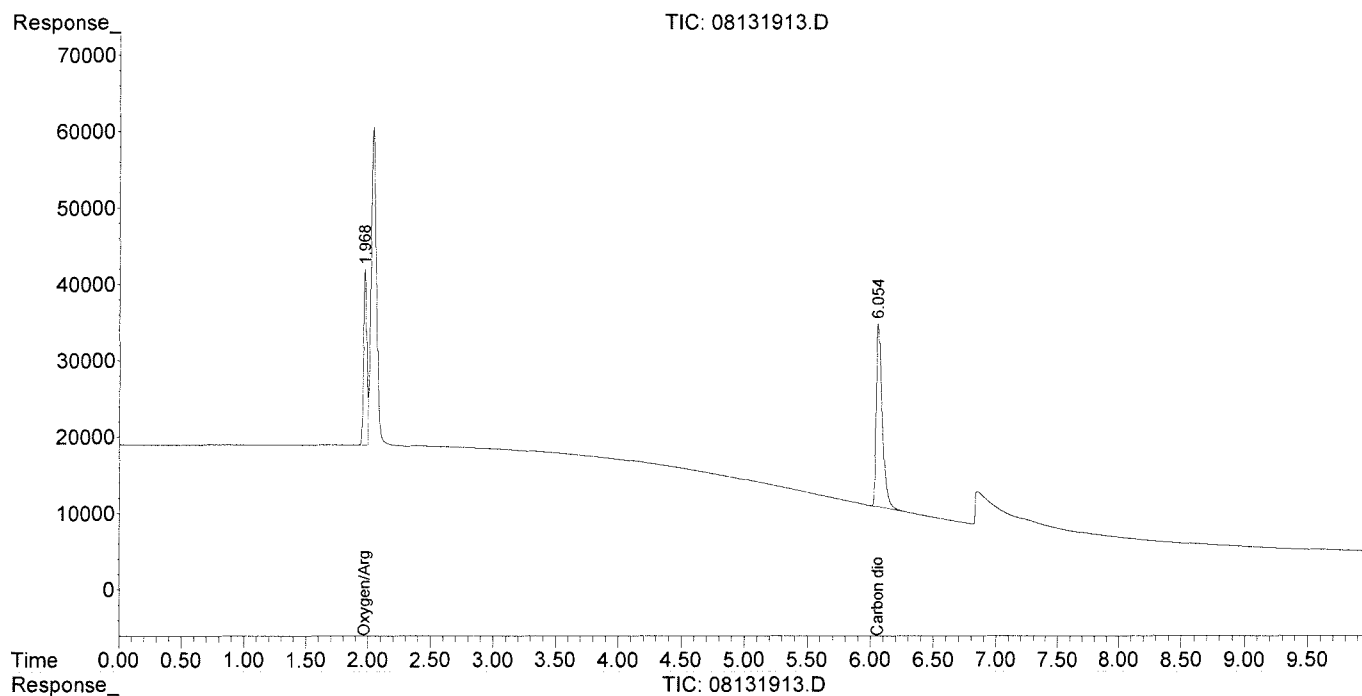
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(m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2019_08\13CO2\
Data File : 08131913.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 13-Aug-2019, 15:24:57
Operator : WH
Sample : p1904717-003 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 13 15:54:19 2019
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



Data Path : J:\GC10\DATA\RSK_FID\2019_08\13CO2\
 Data File : 08131903.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 13-Aug-2019, 12:01:26
 Operator : WH
 Sample : MCS 0.1ml
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Aug 13 12:24:01 2019
 Quant Method : I:\GC10\METHODS\RS082817_CO2.M
 Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 QLast Update : Tue Aug 29 16:13:13 2017
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Oxygen/Argon	1.974f	163795	0.034 ppm
2) Carbon monoxide	1.974f	163795	N.D. ppm
3) Methane (TCD)	0.000	0	N.D. ppm
4) Carbon dioxide	0.000	0	N.D. ppm
6) Methane (FID)	0.000	0	N.D. ppm
7) Ethylene	0.000	0	N.D. ppm
8) Ethane	0.000	0	N.D. ppm
9) Propylene	0.000	0	N.D. ppm
10) Propane	0.000	0	N.D. ppm
11) Isobutylene	0.000	0	N.D. ppm
12) Isobutane	0.000	0	N.D. ppm
13) n-Butane	0.000	0	N.D. ppm

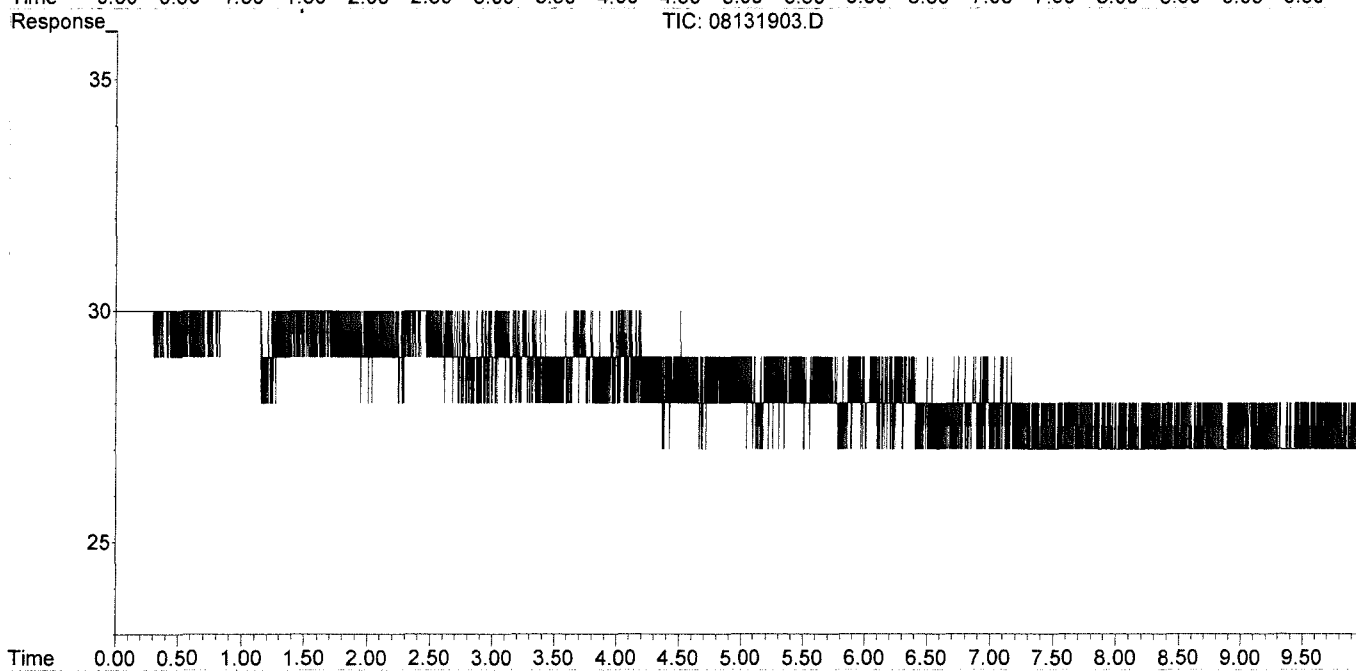
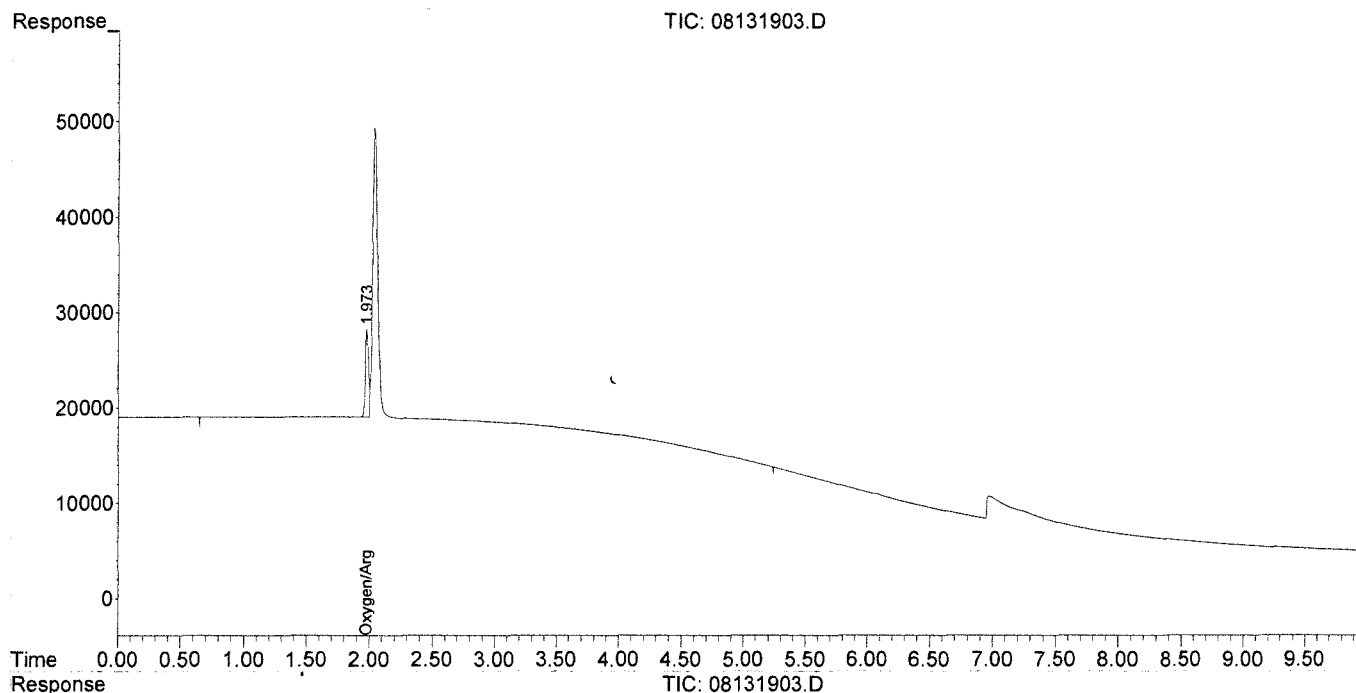
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2019_08\13CO2\
 Data File : 08131903.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 13-Aug-2019, 12:01:26
 Operator : WH
 Sample : MCS 0.1ml
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Aug 13 12:24:01 2019
 Quant Method : I:\GC10\METHODS\RS082817_CO2.M
 Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 QLast Update : Tue Aug 29 16:13:13 2017
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :



Data Path : J:\GC10\DATA\RSK_FID\2019_08\13CO2\
 Data File : 08131905.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 13-Aug-2019, 12:36:48
 Operator : WH
 Sample : LCS TCD
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Aug 13 12:45:59 2019
 Quant Method : I:\GC10\METHODS\RS082817_CO2.M
 Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 QLast Update : Tue Aug 29 16:13:13 2017
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Oxygen/Argon	1.949f	1771658	0.372 ppm
2) Carbon monoxide	1.949f	1771658	N.D. ppm
3) Methane (TCD)	0.000	0	N.D. ppm
4) Carbon dioxide	6.075	212163	903.862 ppm m
6) Methane (FID)	0.000	0	N.D. ppm
7) Ethylene	0.000	0	N.D. ppm
8) Ethane	0.000	0	N.D. ppm
9) Propylene	0.000	0	N.D. ppm
10) Propane	0.000	0	N.D. ppm
11) Isobutylene	0.000	0	N.D. ppm
12) Isobutane	0.000	0	N.D. ppm
13) n-Butane	0.000	0	N.D. ppm

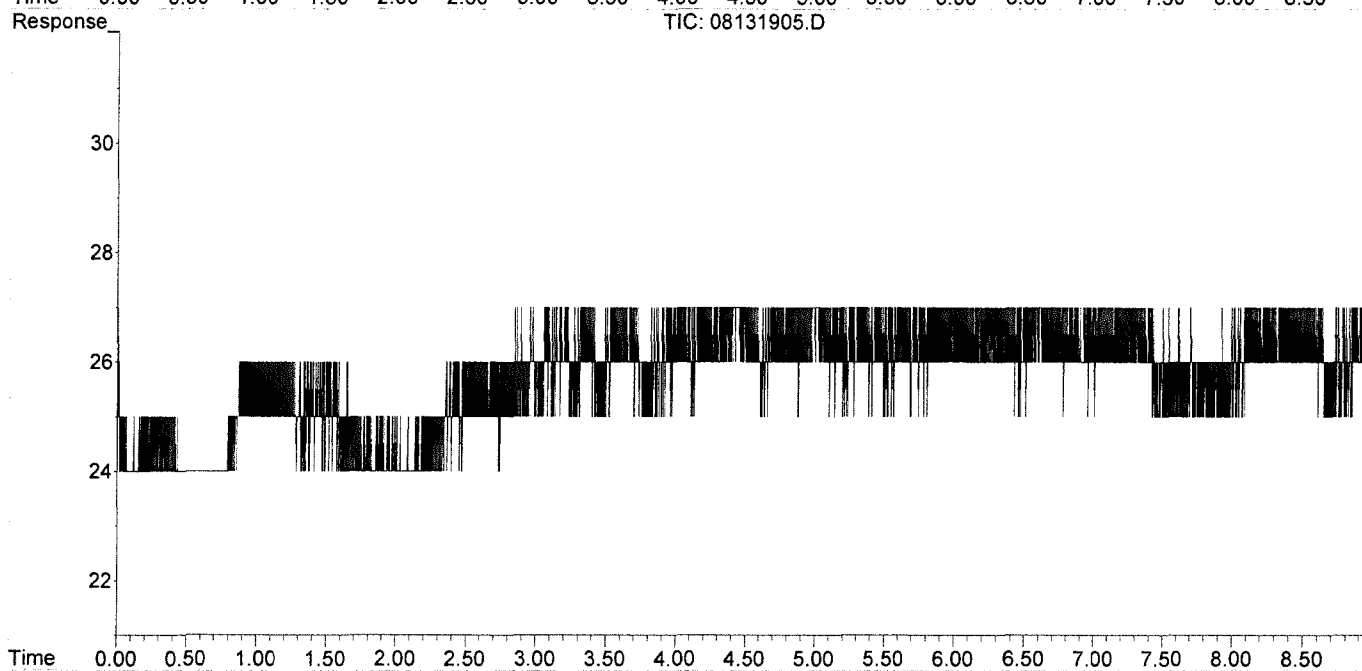
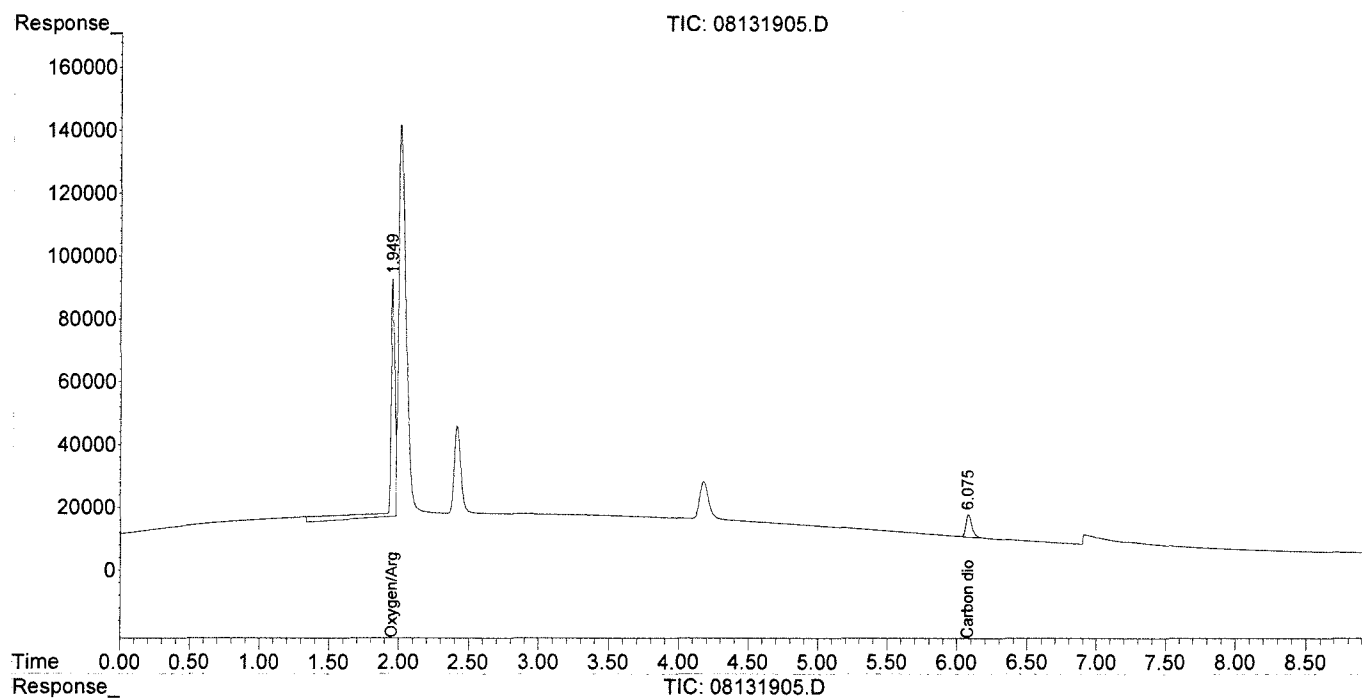
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2019_08\13CO2\
Data File : 08131905.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 13-Aug-2019, 12:36:48
Operator : WH
Sample : LCS TCD
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 13 12:45:59 2019
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

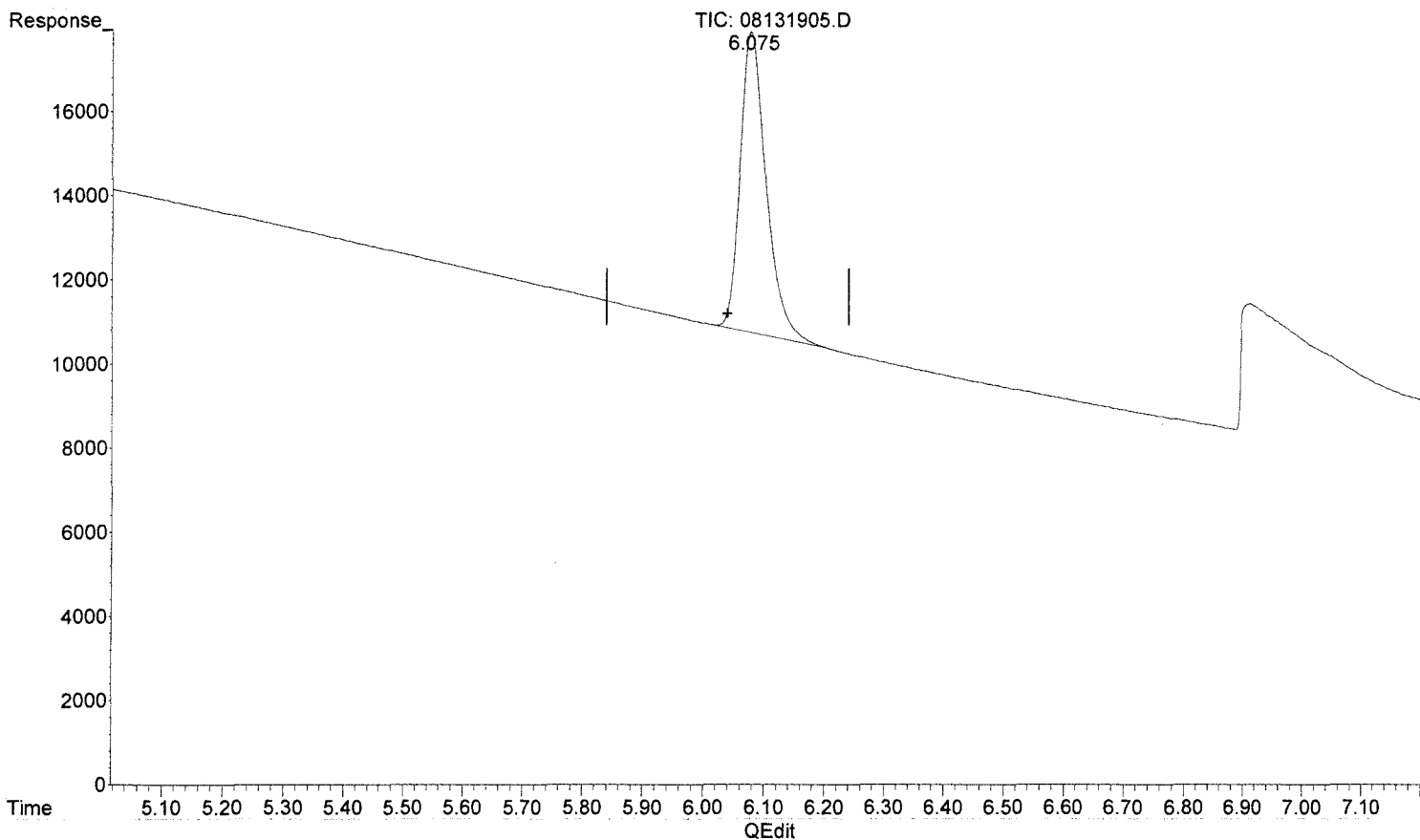
Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



Data Path : J:\GC10\DATA\RSK_FID\2019_08\13CO2\
 Data File : 08131905.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 13-Aug-2019, 12:36:48
 Operator : WH
 Sample : LCS TCD
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Aug 13 12:45:59 2019
 Quant Method : I:\GC10\METHODS\RS082817_CO2.M
 Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 QLast Update : Tue Aug 29 16:13:13 2017
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :



(4) Carbon dioxide
 6.075min 903.862 ppm m
 response 212163

*MR
8/14/19*

*WH 8/13/19
Blue
no previous*

Data Path : J:\GC10\DATA\RSK_FID\2019_08\13CO2\
 Data File : 08131906.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 13-Aug-2019, 12:48:06
 Operator : WH
 Sample : LCSD TCD
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Aug 13 13:55:18 2019
 Quant Method : I:\GC10\METHODS\RS082817_CO2.M
 Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 QLast Update : Tue Aug 29 16:13:13 2017
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :

Compound	R.T.	Response	Conc	Units

Target Compounds				
1) Oxygen/Argon	1.929f	2849642	0.599	ppm
2) Carbon monoxide	1.929f	2849642	N.D.	ppm
3) Methane (TCD)	0.000	0	N.D.	ppm
4) Carbon dioxide	6.066	214633	914.386	ppm m
6) Methane (FID)	0.000	0	N.D.	ppm
7) Ethylene	0.000	0	N.D.	ppm
8) Ethane	0.000	0	N.D.	ppm
9) Propylene	0.000	0	N.D.	ppm
10) Propane	0.000	0	N.D.	ppm
11) Isobutylene	0.000	0	N.D.	ppm
12) Isobutane	0.000	0	N.D.	ppm
13) n-Butane	0.000	0	N.D.	ppm

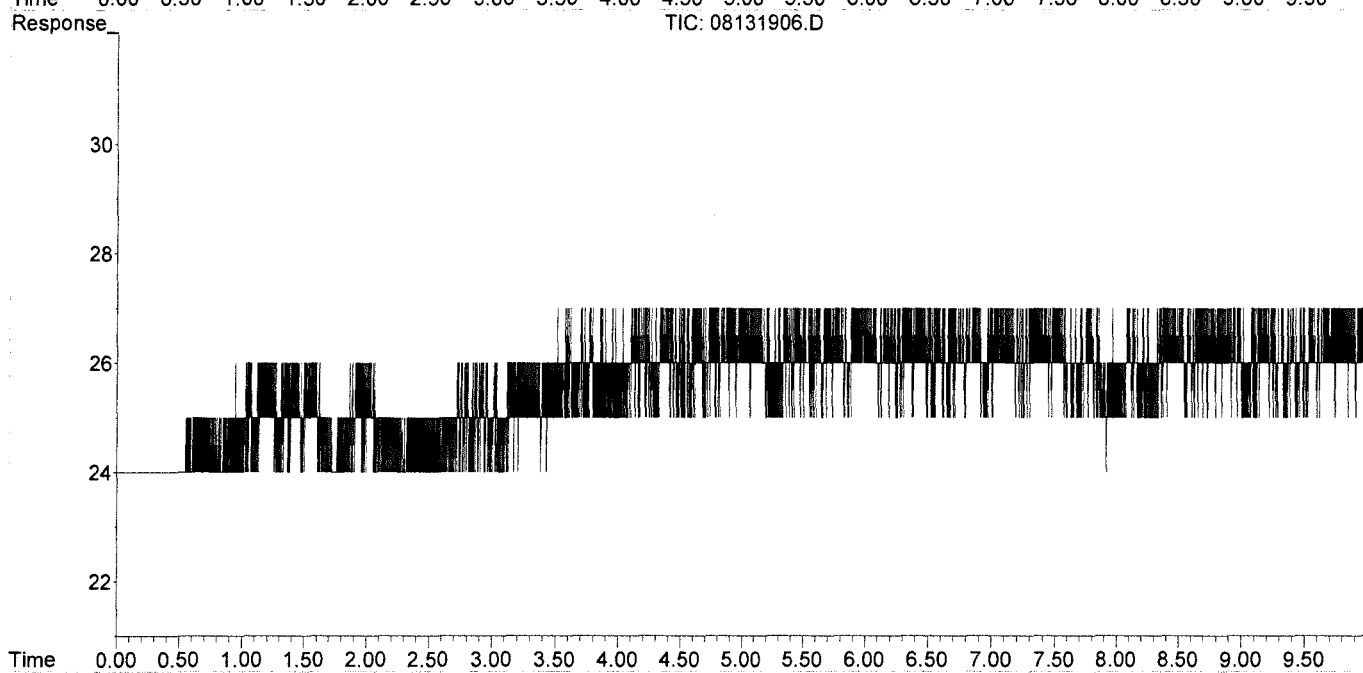
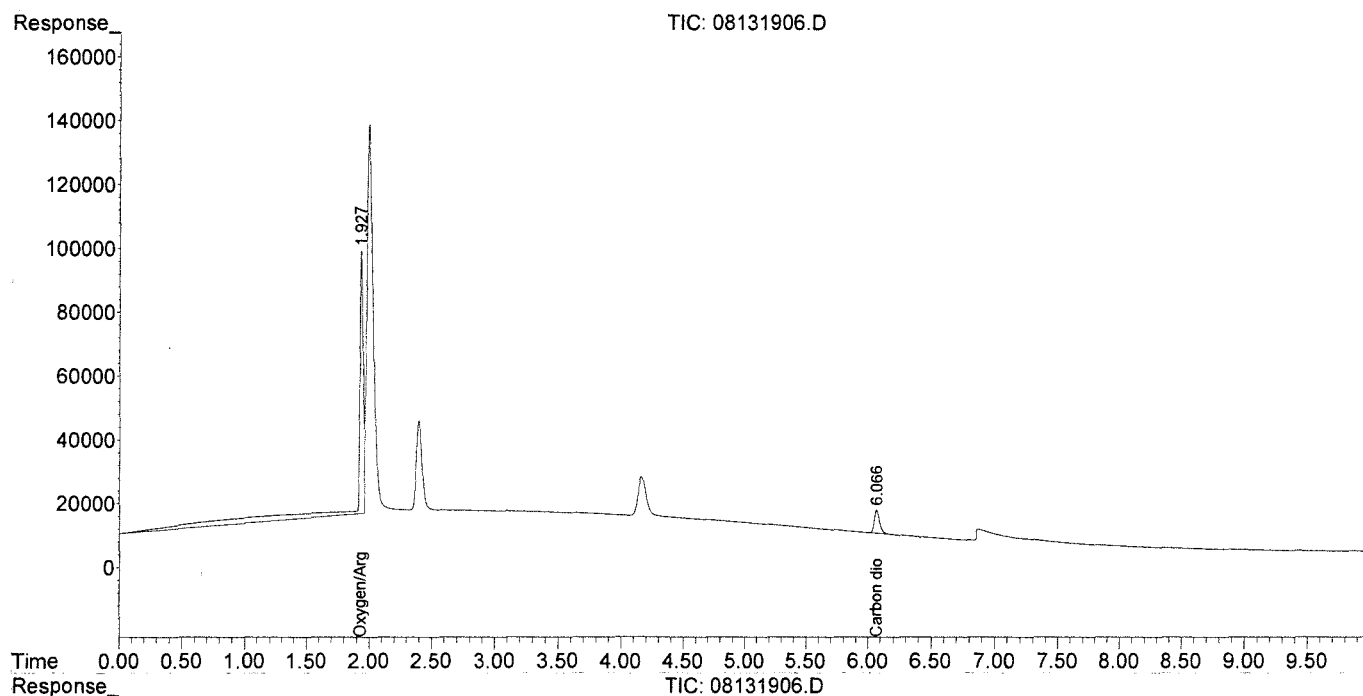
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2019_08\13CO2\
 Data File : 08131906.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 13-Aug-2019, 12:48:06
 Operator : WH
 Sample : LCSD TCD
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Aug 13 13:55:18 2019
 Quant Method : I:\GC10\METHODS\RS082817_CO2.M
 Quant Title : RSK175, VOA-DISGAS, VOA-T03C1C6
 QLast Update : Tue Aug 29 16:13:13 2017
 Response via : Initial Calibration
 Integrator: ChemStation

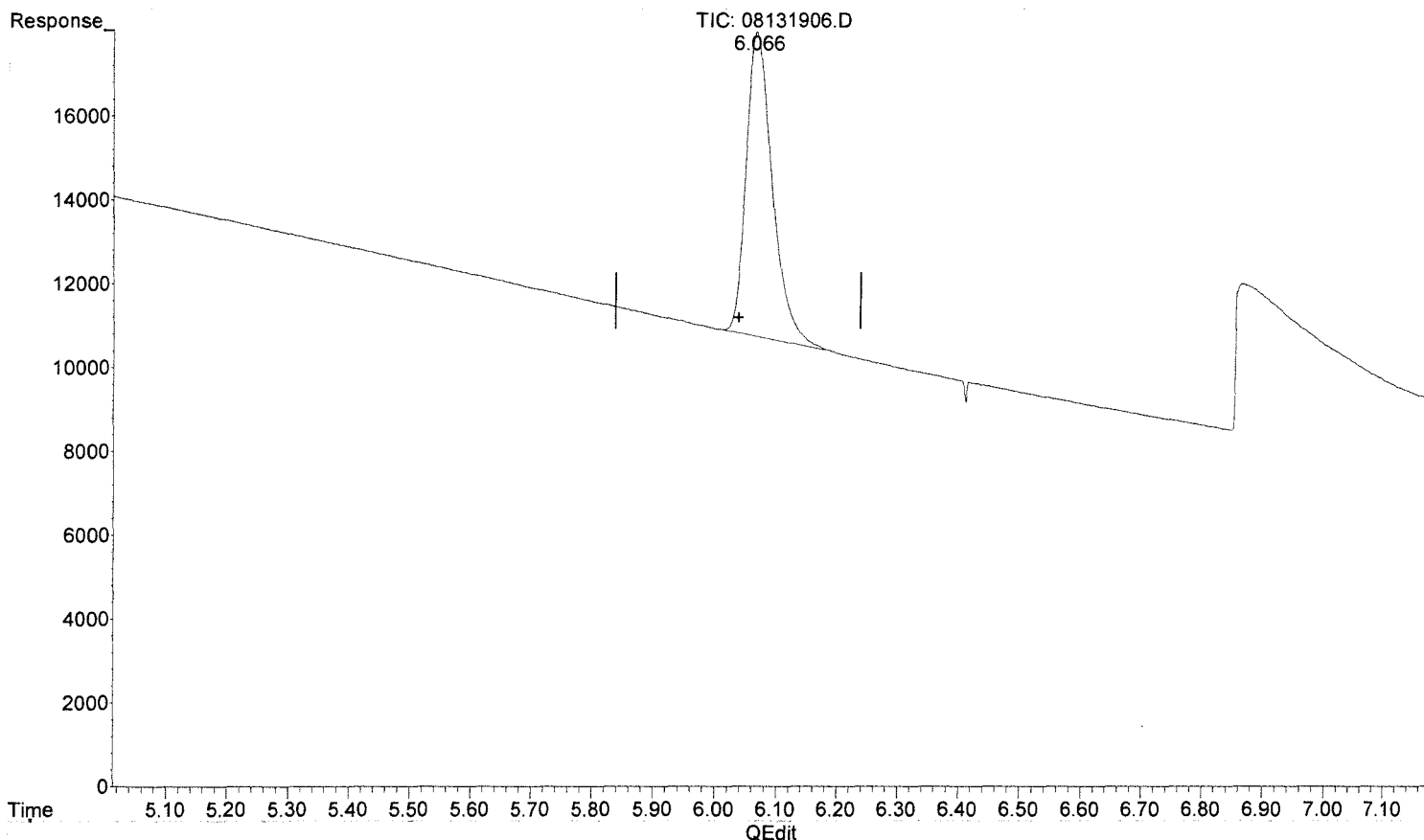
Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :



Data Path : J:\GC10\DATA\RSK_FID\2019_08\13CO2\
 Data File : 08131906.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 13-Aug-2019, 12:48:06
 Operator : WH
 Sample : LCSD TCD
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Aug 13 13:55:18 2019
 Quant Method : I:\GC10\METHODS\RS082817_CO2.M
 Quant Title : RSK175, VOA-DISGAS, VOA-T03C1C6
 QLast Update : Tue Aug 29 16:13:13 2017
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :



(4) Carbon dioxide
 6.066min 914.386 ppm m
 response 214633

*MR
8/14/19*

*low of 13619
BLE
no previous*

Method Path : I:\GC10\METHODS\
 Method File : RS082817_CO2.M
 Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 Last Update : Tue Aug 29 16:13:13 2017
 Response Via : Initial Calibration

Calibration Files

1 =08291715.D 2 =08291716.D 3 =08291717.D
 4 =08291719.D 5 =08291720.D 6 =08291721.D

Compound	1	2	3	4	5	6	Avg	%RSD
1) Oxygen/Argon	4.760						4.760 E6	0.00
2) Carbon monoxide	2.775		1.066	0.043	0.033	0.027	0.657 E6	170.12
3) Methane (TCD)							9.457	0.00
4) Carbon dioxide	2.717	2.193	2.338	2.272	2.265	2.298	2.347 E2	7.99

Signal #2 Calibration Files

1 =08291715.D 2 =08291716.D 3 =08291717.D
 4 =08291719.D 5 =08291720.D 6 =08291721.D

Compound	1	2	3	4	5	6	Avg	%RSD
6) Methane (FID)	1.253	1.160	1.005	0.927	0.848	0.848	0.945 E4	15.85
7) Ethylene	1.677	1.605	1.900	1.749	1.597	1.579	1.684 E4	7.30
8) Ethane	1.769	1.631	1.866	1.767	1.639	1.667	1.723 E4	5.40
9) Propylene	2.402	2.309	2.767	2.551	2.331	2.333	2.449 E4	7.32
10) Propane	2.906	2.737	2.817	2.639	2.410	2.420	2.655 E4	7.75
11) Isobutylene							0.000	-1.00
12) Isobutane							0.000	-1.00
13) n-Butane							0.000	-1.00

(#) = Out of Range ### Number of calibration levels exceeded format ###

RS082817_CO2.M Wed Aug 30 13:24:19 2017

dit Compounds: -- Compound #4 -- Carbon dioxide

Search by: Ret Time

Compound Database
External Standard Compound

- Oxygen/Argon
- Carbon monoxide
- Methane (TCD)
- Carbon dioxide
- Signal #2
- Methane (FID)
- Ethylene
- Ethane
- Propylene
- Propane
- Isobutylene
- Isobutane
- n-Butane

Name

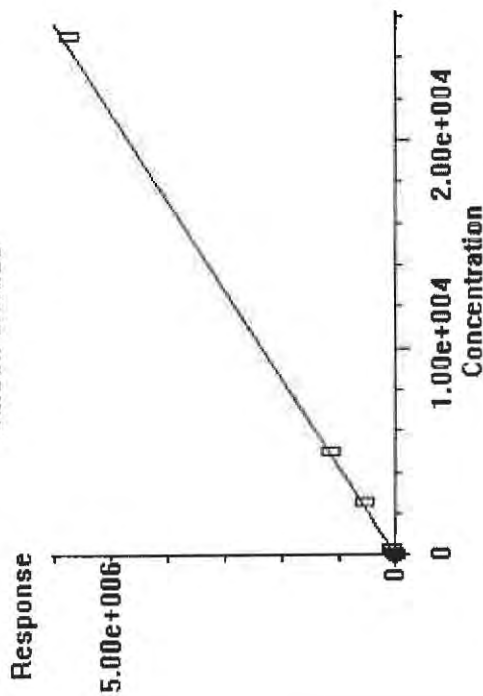
Identification Calibration User-Defined Advanced Reporting

Index

Find Compound

Lvl ID	Concentration	Response	Lvl ID	Concentration	Response
1	25.000000	6793.665186			
2	100.000000	21932.418000			
3	250.000000	58460.642510			
4	2500.000000	568043.388750			
5	5000.000000	1132363.215937			
6	25000.000000	5744294.891563			
7	25000.000000				
8	25000.000000				
9	2000.000000				
10	30000.000000				

Carbon dioxide



0.000e+000	Quadratic term
2.347e+002	Linear term
0.000e+000	Constant term
7.987%	RF Rel Std Dev

OK

Cancel

Help

Print Calibration Curve

Copy Calibration Curve

Method Path : I:\GC10\METHODS\
 Method File : RS082817_CO2.M
 Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 Last Update : Tue Aug 29 16:13:13 2017
 Response Via : Initial Calibration

#	ID	Conc	ISTD Conc	Path\File
1	1	0	0	J:\GC10\DATA\RSK_FID\2017_08\29\08291715.D
2	2	0	0	J:\GC10\DATA\RSK_FID\2017_08\29\08291716.D
3	3	3	0	J:\GC10\DATA\RSK_FID\2017_08\29\08291717.D
4	4	10	0	J:\GC10\DATA\RSK_FID\2017_08\29\08291719.D
5	5	25	0	J:\GC10\DATA\RSK_FID\2017_08\29\08291720.D
6	6	125	0	J:\GC10\DATA\RSK_FID\2017_08\29\08291721.D
7	7	5000	0	J:\GC10\DATA\RSK_FID\2017_08\24\08241708.D
8	8	25000	0	J:\GC10\DATA\RSK_FID\2017_08\24\08241709.D
9	9	2000	0	J:\GC10\DATA\RSK_FID\2017_08\24\08241710.D
10	10	30000	0	J:\GC10\DATA\RSK_FID\2017_08\24\08241711.D

#	ID	Update Time	Quant Time	Acquisition Time
1	1	Aug 29 14:21 2017	Aug 29 14:20 2017	29-Aug-2017, 14:07
2	2	Aug 29 14:52 2017	Aug 29 14:51 2017	29-Aug-2017, 14:22
3	3	Aug 29 15:04 2017	Aug 29 15:04 2017	29-Aug-2017, 14:53
4	4	Aug 29 15:36 2017	Aug 29 15:36 2017	29-Aug-2017, 15:23
5	5	Aug 29 15:57 2017	Aug 29 15:57 2017	29-Aug-2017, 15:44
6	6	Aug 29 16:13 2017	Aug 29 16:13 2017	29-Aug-2017, 16:00
7	7	Aug 25 09:05 2017	Aug 24 16:00 2017	24-Aug-2017, 15:44
8	8	Aug 25 09:06 2017	Aug 24 16:13 2017	24-Aug-2017, 16:02
9	9	Aug 25 09:06 2017	Aug 24 16:31 2017	24-Aug-2017, 16:16
10	10	Aug 25 09:07 2017	Aug 24 16:42 2017	24-Aug-2017, 16:33

RS082817_CO2.M Wed Aug 30 13:24:30 2017

Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
 Data File : 08291715.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 29-Aug-2017, 14:07
 Operator : MC
 Sample : 25ppm s32-08291701 0.25ml
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Aug 29 14:20:06 2017
 Quant Method : I:\GC10\METHODS\RS082417.M
 Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 QLast Update : Fri Aug 25 09:19:14 2017
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :

Compound	R.T.	Response	Conc	Units

Target Compounds				
1) Oxygen/Argon	0.000	0	N.D.	ppm d
2) Carbon monoxide	1.776	277465	N.D.	ppm
3) Methane (TCD)	0.000	0	N.D.	ppm
4) Carbon dioxide	5.978	6794	27.870	ppm m
6) Methane (FID)	0.000	0	N.D.	ppm d
7) Ethylene	0.000	0	N.D.	ppm
8) Ethane	0.000	0	N.D.	ppm
9) Propylene	0.000	0	N.D.	ppm
10) Propane	0.000	0	N.D.	ppm
11) Isobutylene	0.000	0	N.D.	ppm
12) Isobutane	0.000	0	N.D.	ppm
13) n-Butane	0.000	0	N.D.	ppm

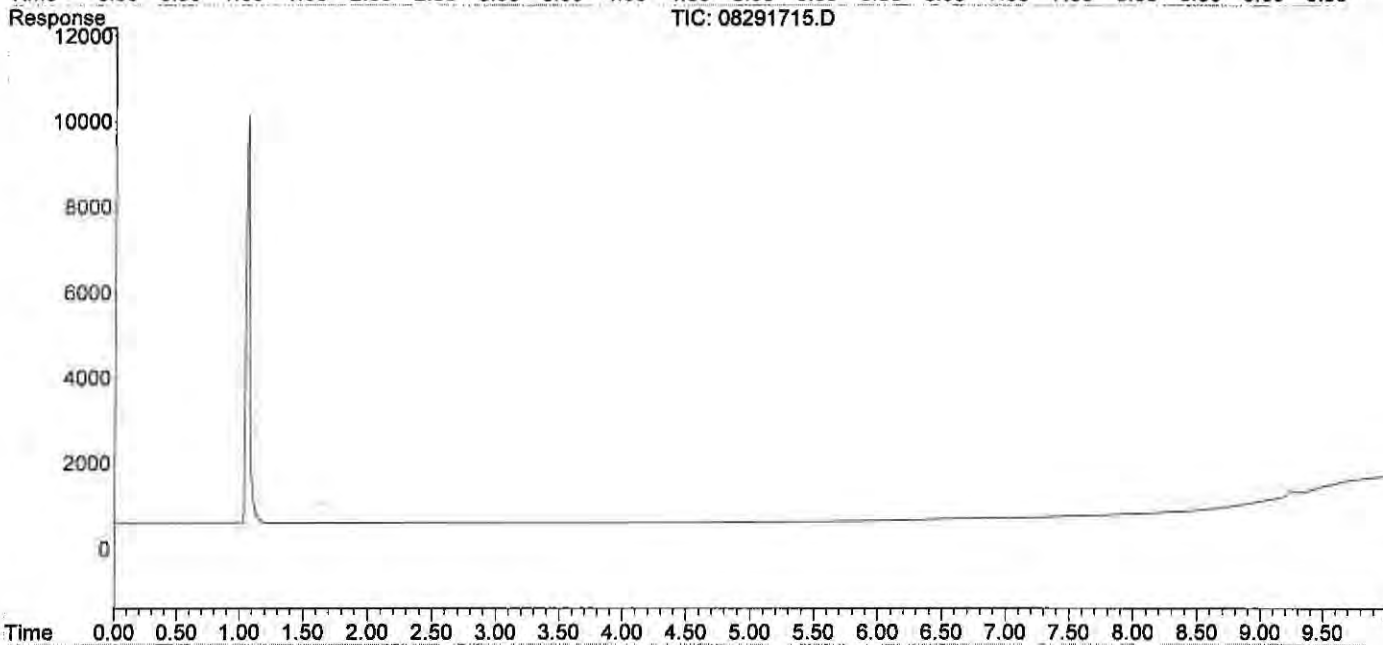
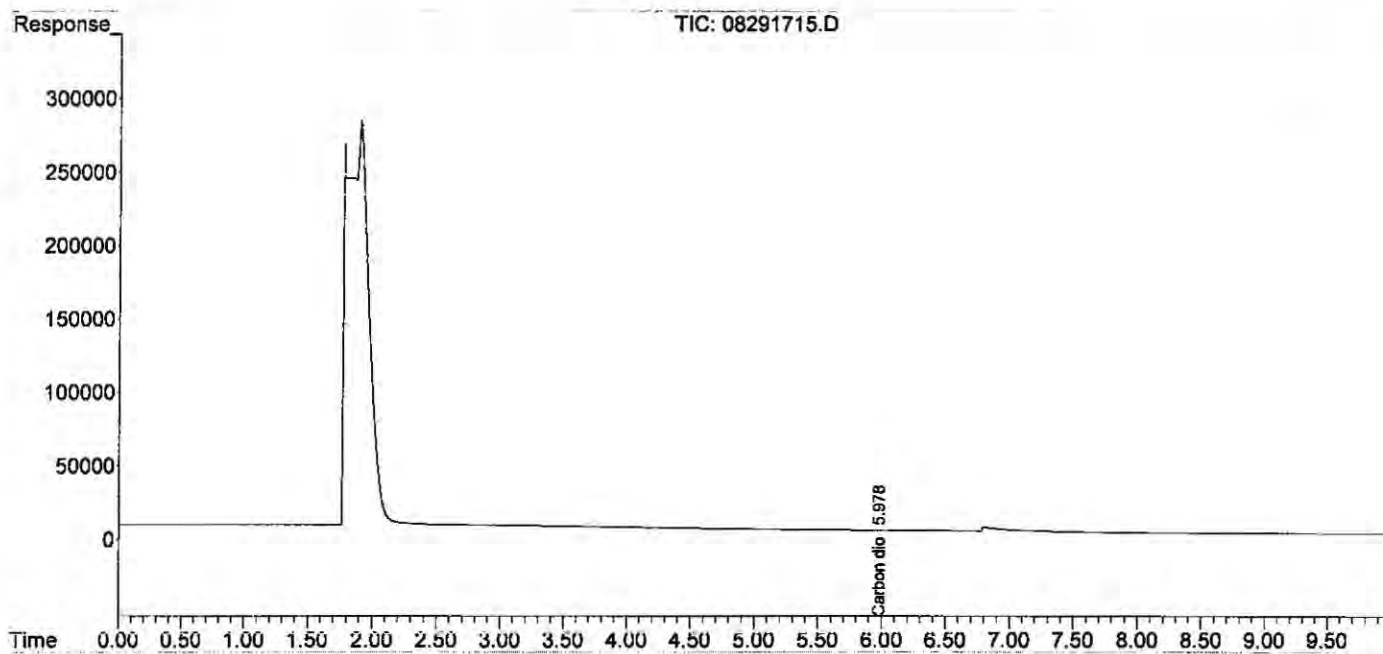
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
 Data File : 08291715.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 29-Aug-2017, 14:07
 Operator : MC
 Sample : 25ppm s32-08291701 0.25ml
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Aug 29 14:20:06 2017
 Quant Method : I:\GC10\METHODS\RS082417.M
 Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 QLast Update : Fri Aug 25 09:19:14 2017
 Response via : Initial Calibration
 Integrator: ChemStation

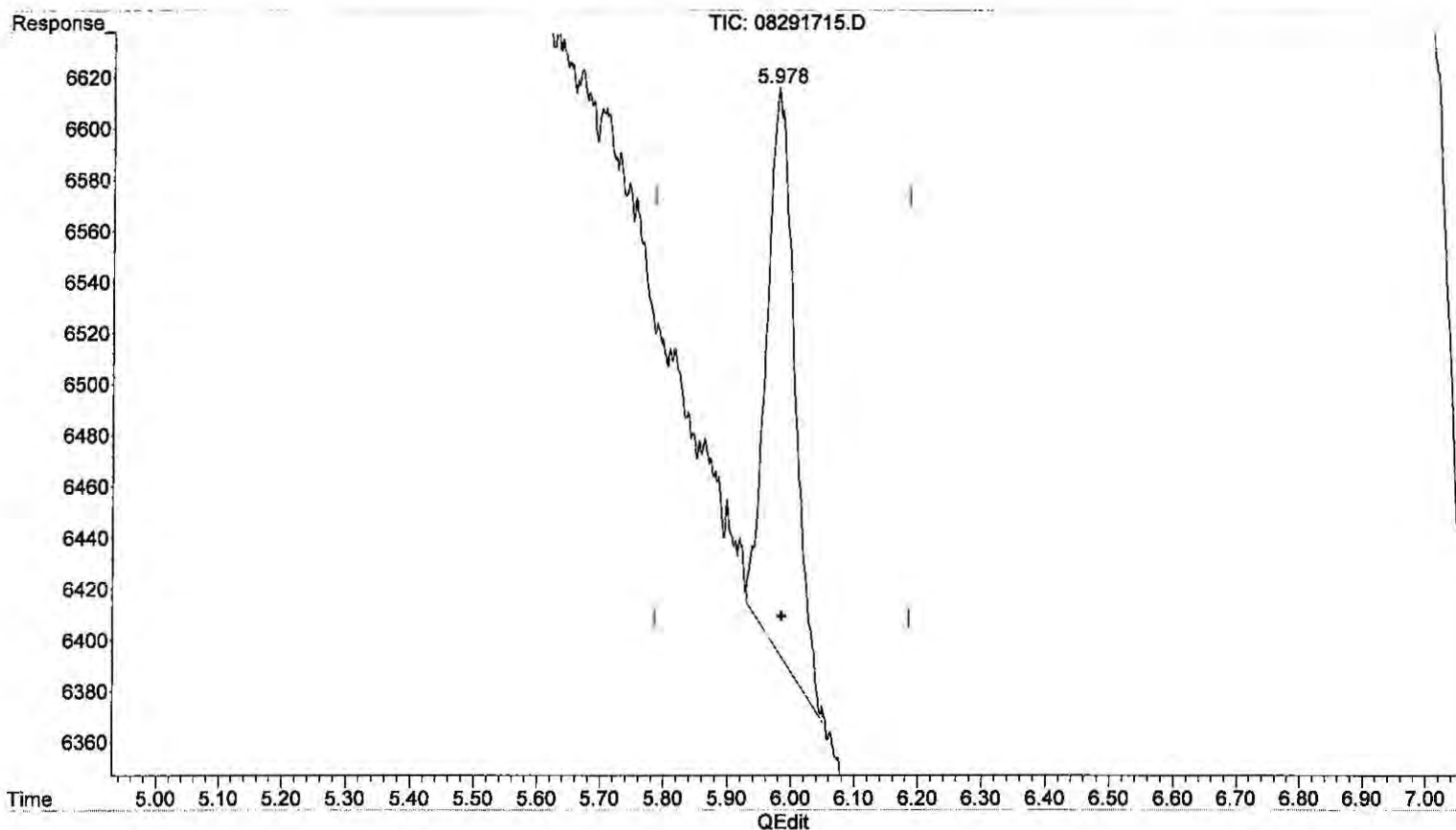
Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :



Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
 Data File : 08291715.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 29-Aug-2017, 14:07
 Operator : MC
 Sample : 25ppm s32-08291701 0.25ml
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Aug 29 14:20:06 2017
 Quant Method : I:\GC10\METHODS\RS082417.M
 Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 QLast Update : Fri Aug 25 09:19:14 2017
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :



(4) Carbon dioxide
 5.978min 27.870 ppm m
 response 6794

MC
8/30/17
BL
MC
ppm

8/14/17

Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
 Data File : 08291716.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 29-Aug-2017, 14:22
 Operator : MC
 Sample : 100ppm s32-08291702 0.2ml
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Aug 29 14:51:38 2017
 Quant Method : I:\GC10\METHODS\RS082817_CO2.M
 Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 QLast Update : Tue Aug 29 14:21:08 2017
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :

Compound	R.T.	Response	Conc	Units
Target Compounds				
1) Oxygen/Argon	1.790	-598962	N.D.	ppm
2) Carbon monoxide	0.000	0	N.D.	ppm d
3) Methane (TCD)	0.000	0	N.D.	ppm
4) Carbon dioxide	5.978	21932	87.858	ppm
6) Methane (FID)	0.000	0	N.D.	ppm d
7) Ethylene	0.000	0	N.D.	ppm
8) Ethane	0.000	0	N.D.	ppm
9) Propylene	0.000	0	N.D.	ppm
10) Propane	0.000	0	N.D.	ppm
11) Isobutylene	0.000	0	N.D.	ppm
12) Isobutane	0.000	0	N.D.	ppm
13) n-Butane	0.000	0	N.D.	ppm

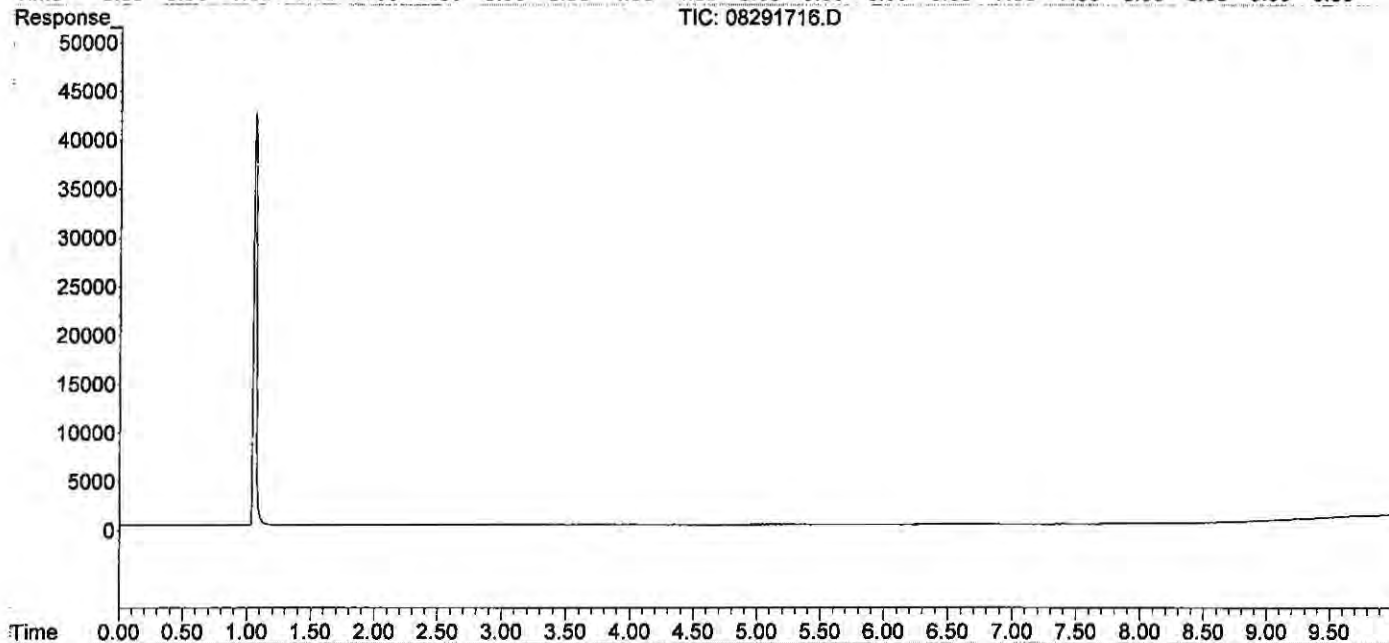
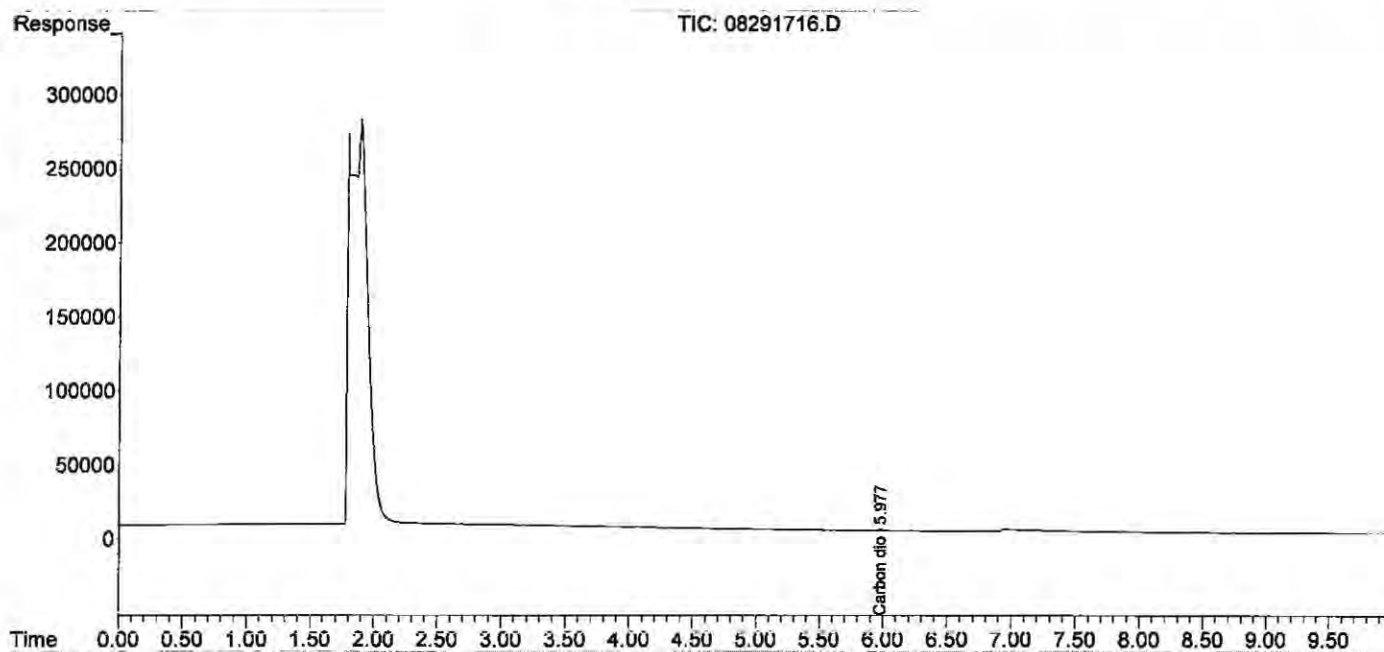
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
 Data File : 08291716.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 29-Aug-2017, 14:22
 Operator : MC
 Sample : 100ppm s32-08291702 0.2ml
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Aug 29 14:51:38 2017
 Quant Method : I:\GC10\METHODS\RS082817_CO2.M
 Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 QLast Update : Tue Aug 29 14:21:08 2017
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :



Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
 Data File : 08291717.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 29-Aug-2017, 14:53
 Operator : MC
 Sample : 250ppm s32-08291702 0.5ml
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Aug 29 15:03:42 2017
 Quant Method : I:\GC10\METHODS\RS082817_CO2.M
 Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 QLast Update : Tue Aug 29 14:52:06 2017
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :

Compound	R.T.	Response	Conc	Units

Target Compounds				
1) Oxygen/Argon	1.920f	-30716454	N.D.	ppm
2) Carbon monoxide	0.000	0	N.D.	ppm d
3) Methane (TCD)	0.000	0	N.D.	ppm d
4) Carbon dioxide	5.970	58461	240.204	ppm m
6) Methane (FID)	0.000	0	N.D.	ppm d
7) Ethylene	0.000	0	N.D.	ppm
8) Ethane	0.000	0	N.D.	ppm
9) Propylene	0.000	0	N.D.	ppm
10) Propane	0.000	0	N.D.	ppm
11) Isobutylene	0.000	0	N.D.	ppm
12) Isobutane	0.000	0	N.D.	ppm
13) n-Butane	0.000	0	N.D.	ppm

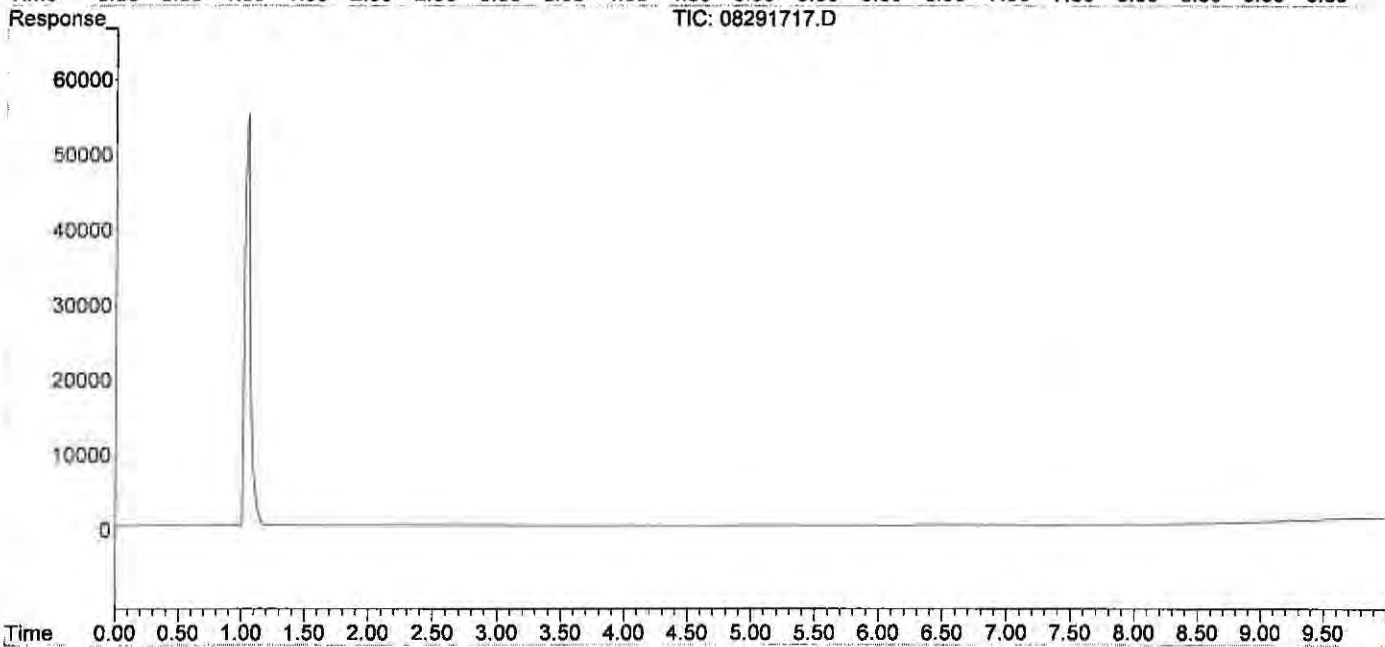
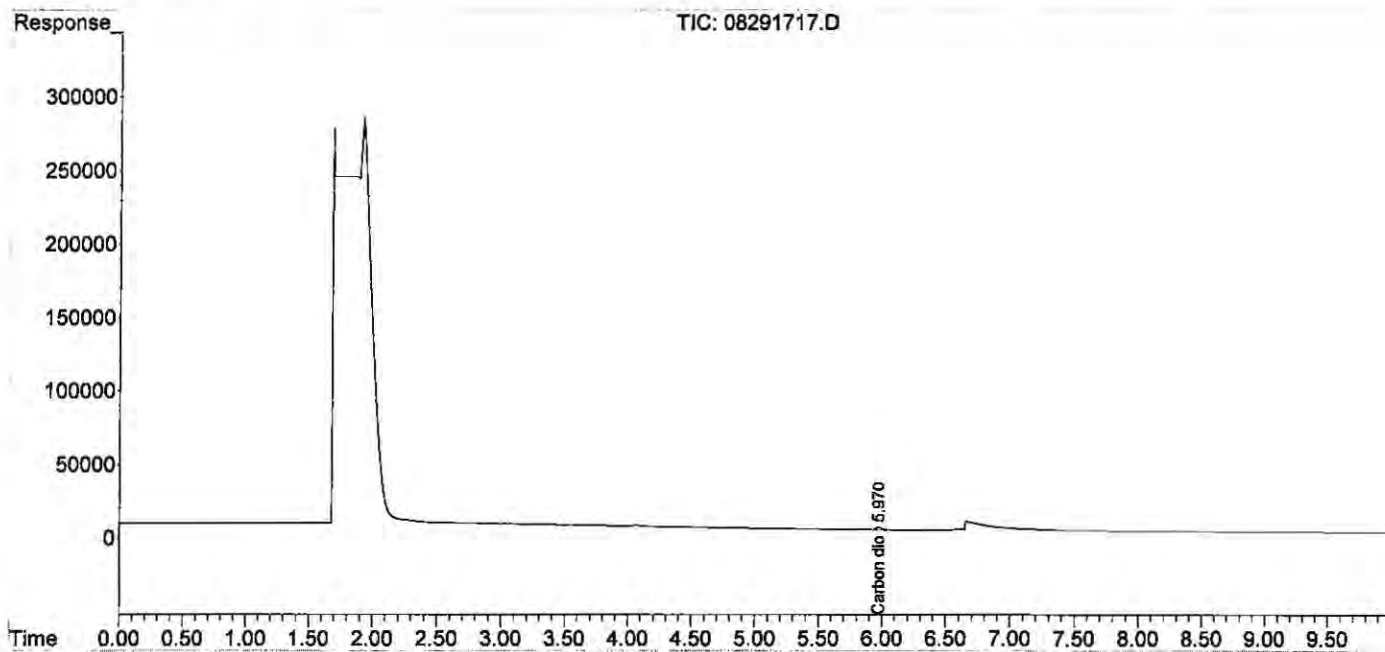
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
 Data File : 08291717.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 29-Aug-2017, 14:53
 Operator : MC
 Sample : 250ppm s32-08291702 0.5ml
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Aug 29 15:03:42 2017
 Quant Method : I:\GC10\METHODS\RS082817_CO2.M
 Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 QLast Update : Tue Aug 29 14:52:06 2017
 Response via : Initial Calibration
 Integrator: ChemStation

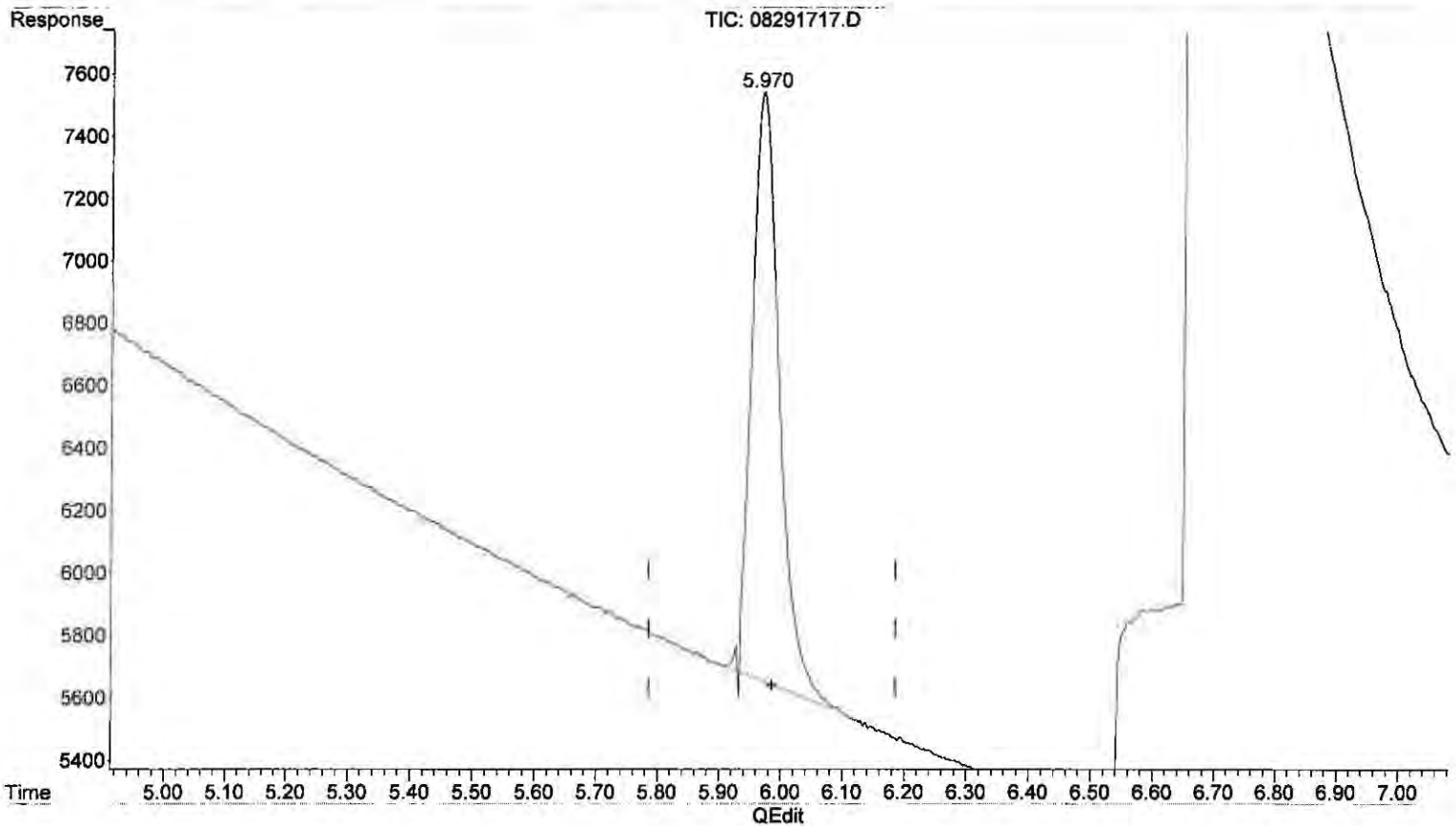
Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :



Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
 Data File : 08291717.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 29-Aug-2017, 14:53
 Operator : MC
 Sample : 250ppm s32-08291702 0.5ml
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Aug 29 15:03:42 2017
 Quant Method : I:\GC10\METHODS\RS082817_CO2.M
 Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 QLast Update : Tue Aug 29 14:52:06 2017
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :



(4) Carbon dioxide
 5.970min 240.204 ppm m
 response 58461

*Mc
 8/1/17
 PL
 Ms
 Prewer*

Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
 Data File : 08291719.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 29-Aug-2017, 15:23
 Operator : MC
 Sample : 2500ppm s32-08231701 50ul
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Aug 29 15:35:50 2017
 Quant Method : I:\GC10\METHODS\RS082817_CO2.M
 Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 QLast Update : Tue Aug 29 15:04:14 2017
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :

Compound	R.T.	Response	Conc	Units

Target Compounds				
1) Oxygen/Argon	0.000	0	N.D.	ppm d
2) Carbon monoxide	1.891	425113	N.D.	ppm
3) Methane (TCD)	0.000	0	N.D.	ppm d
4) Carbon dioxide	5.962	568043	2369.673	ppm
6) Methane (FID)	0.000	0	N.D.	ppm d
7) Ethylene	0.000	0	N.D.	ppm
8) Ethane	0.000	0	N.D.	ppm
9) Propylene	0.000	0	N.D.	ppm
10) Propane	0.000	0	N.D.	ppm
11) Isobutylene	0.000	0	N.D.	ppm
12) Isobutane	0.000	0	N.D.	ppm
13) n-Butane	0.000	0	N.D.	ppm

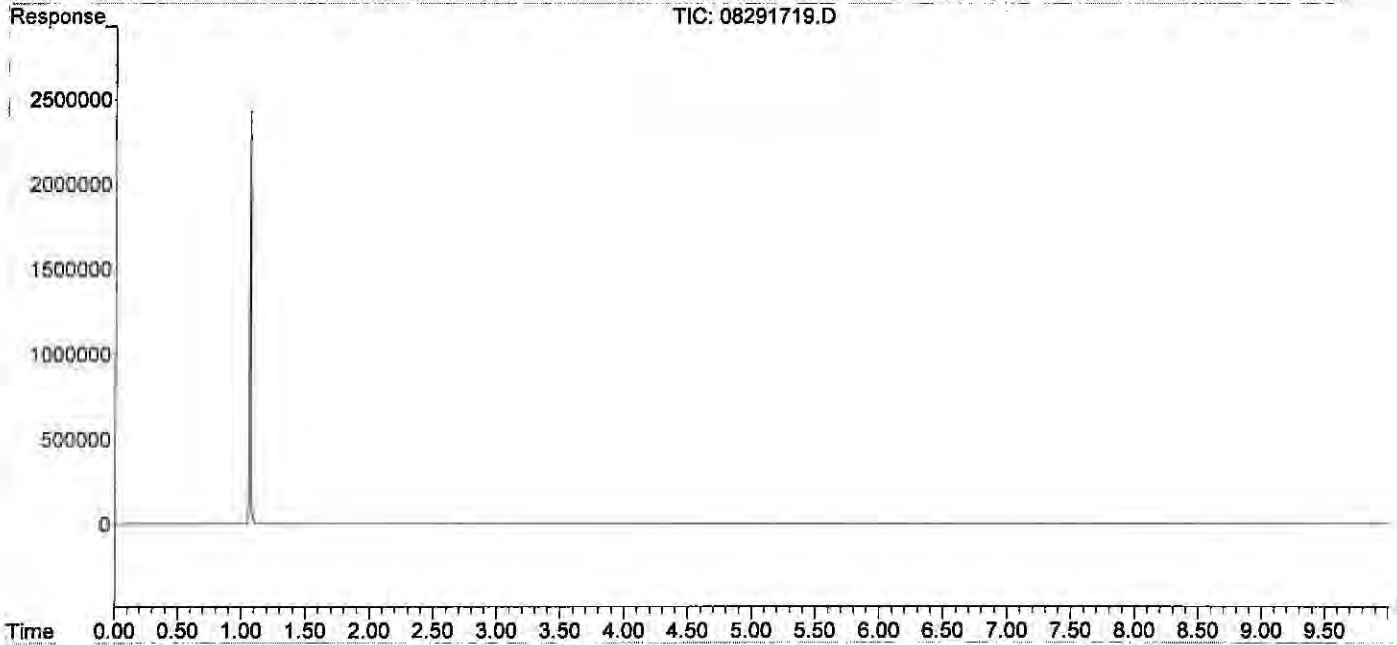
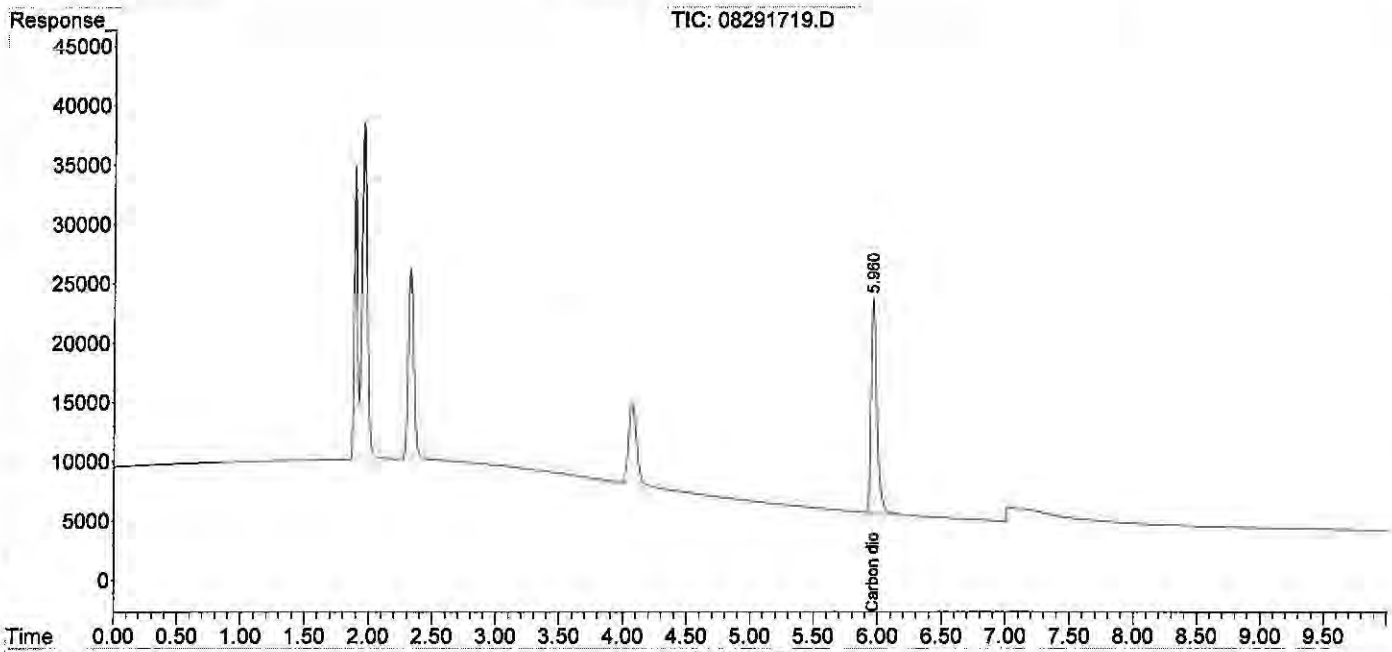
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
 Data File : 08291719.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 29-Aug-2017, 15:23
 Operator : MC
 Sample : 2500ppm s32-08231701 50ul
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Aug 29 15:35:50 2017
 Quant Method : I:\GC10\METHODS\RS082817_CO2.M
 Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 QLast Update : Tue Aug 29 15:04:14 2017
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :



Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
 Data File : 08291720.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 29-Aug-2017, 15:44
 Operator : MC
 Sample : 5000ppm s32-08231701 0.1ml
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Aug 29 15:57:17 2017
 Quant Method : I:\GC10\METHODS\RS082817_CO2.M
 Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 QLast Update : Tue Aug 29 15:36:14 2017
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :

Compound	R.T.	Response	Conc	Units
Target Compounds				
1) Oxygen/Argon	0.000	0	N.D.	ppm d
2) Carbon monoxide	1.880	819221	N.D.	ppm
3) Methane (TCD)	0.000	0	N.D.	ppm d
4) Carbon dioxide	5.948	1132363	4753.126	ppm
6) Methane (FID)	0.000	0	N.D.	ppm d
7) Ethylene	0.000	0	N.D.	ppm
8) Ethane	0.000	0	N.D.	ppm
9) Propylene	0.000	0	N.D.	ppm
10) Propane	0.000	0	N.D.	ppm
11) Isobutylene	0.000	0	N.D.	ppm
12) Isobutane	0.000	0	N.D.	ppm
13) n-Butane	0.000	0	N.D.	ppm

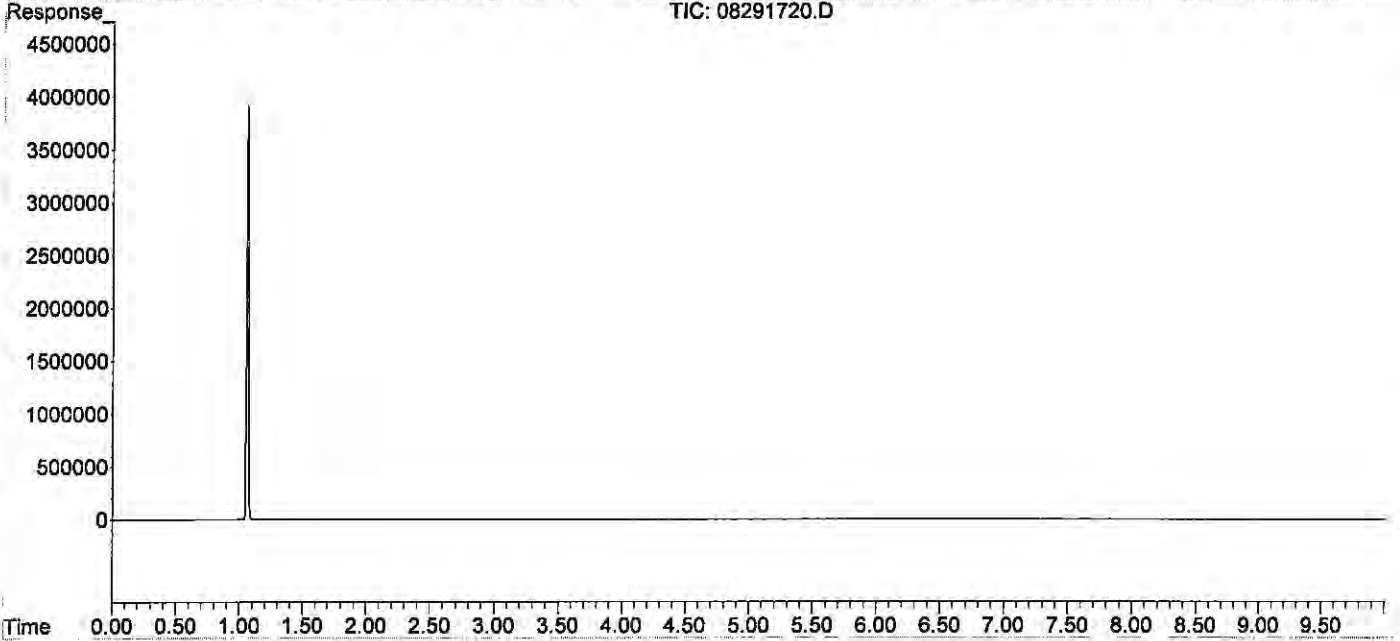
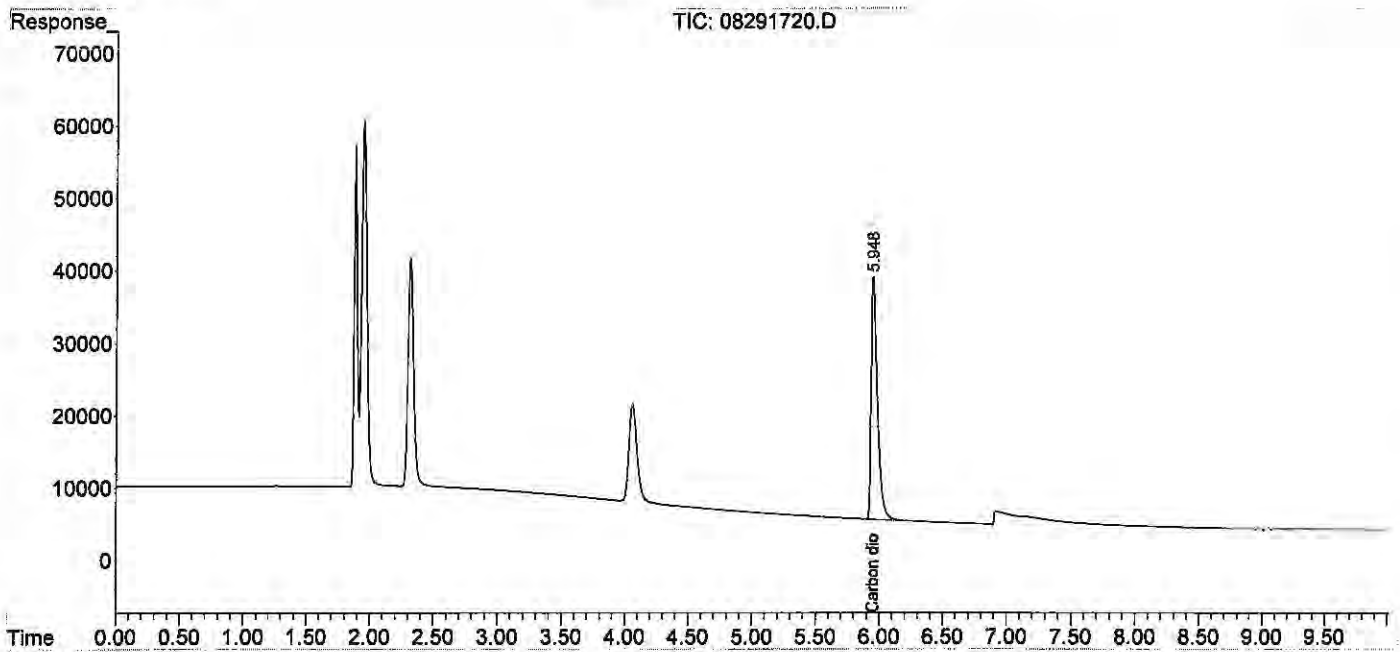
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
 Data File : 08291720.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 29-Aug-2017, 15:44
 Operator : MC
 Sample : 5000ppm s32-08231701 0.1ml
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Aug 29 15:57:17 2017
 Quant Method : I:\GC10\METHODS\RS082817_CO2.M
 Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 QLast Update : Tue Aug 29 15:36:14 2017
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :



Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
 Data File : 08291721.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 29-Aug-2017, 16:00
 Operator : MC
 Sample : 25000ppm s32-08231701 0.5ml
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Aug 29 16:12:53 2017
 Quant Method : I:\GC10\METHODS\RS082817_CO2.M
 Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 QLast Update : Tue Aug 29 15:57:37 2017
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :

Compound	R.T.	Response	Conc	Units
Target Compounds				
1) Oxygen/Argon	0.000	0	N.D.	ppm d
2) Carbon monoxide	1.827	3325463	N.D.	ppm
3) Methane (TCD)	0.000	0	N.D.	ppm d
4) Carbon dioxide	5.879f	5744295	24443.288	ppm
6) Methane (FID)	0.000	0	N.D.	ppm d
7) Ethylene	0.000	0	N.D.	ppm
8) Ethane	0.000	0	N.D.	ppm
9) Propylene	0.000	0	N.D.	ppm
10) Propane	0.000	0	N.D.	ppm
11) Isobutylene	0.000	0	N.D.	ppm
12) Isobutane	0.000	0	N.D.	ppm
13) n-Butane	0.000	0	N.D.	ppm

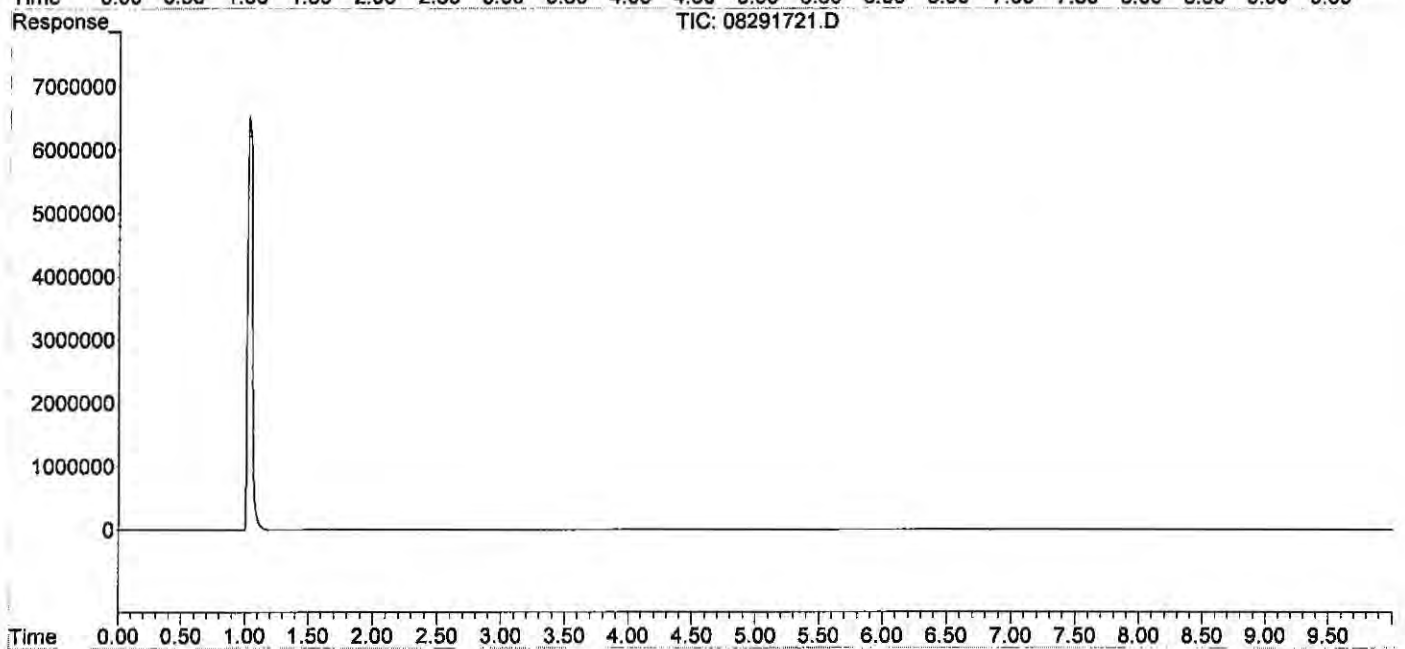
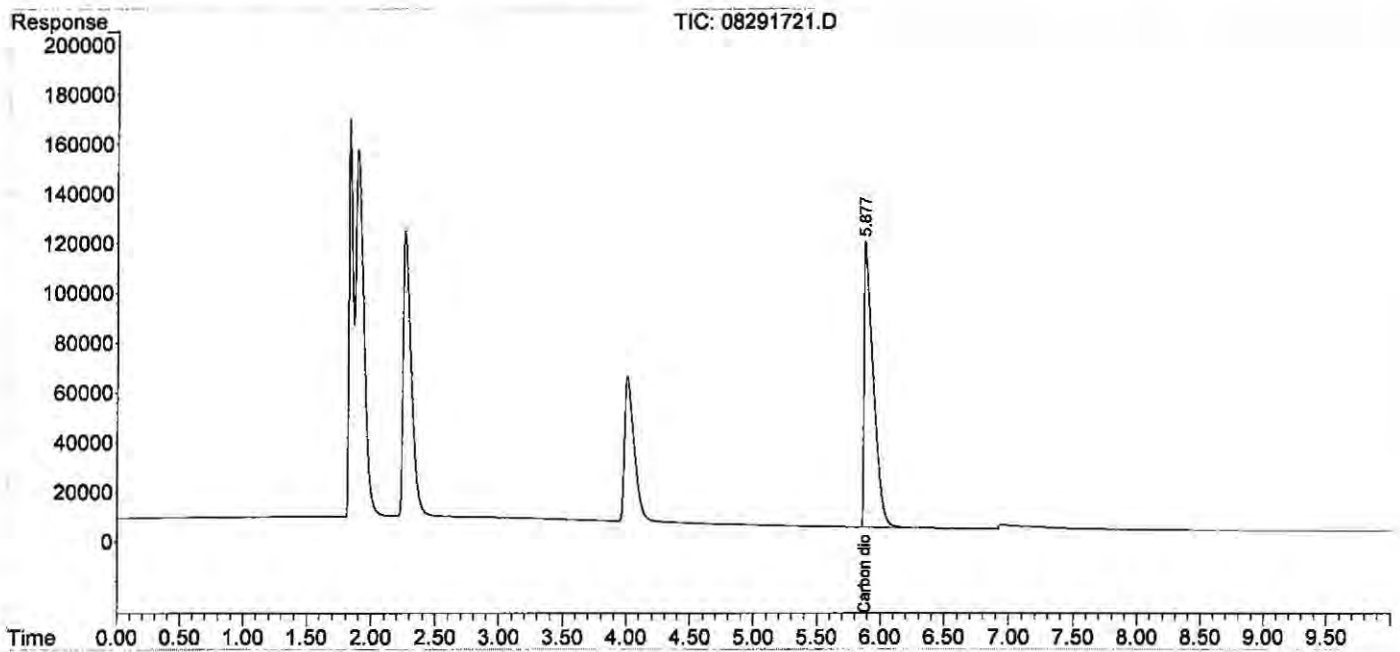
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
 Data File : 08291721.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 29-Aug-2017, 16:00
 Operator : MC
 Sample : 25000ppm s32-08231701 0.5ml
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Aug 29 16:12:53 2017
 Quant Method : I:\GC10\METHODS\RS082817_CO2.M
 Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 QLast Update : Tue Aug 29 15:57:37 2017
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :



Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
 Data File : 08291723.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 29-Aug-2017, 16:35
 Operator : MC
 Sample : icv s30-07071701
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Aug 29 16:54:07 2017
 Quant Method : I:\GC10\METHODS\RS082817_CO2.M
 Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 QLast Update : Tue Aug 29 16:13:13 2017
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :

Compound	R.T.	Response	Conc Units	

Target Compounds				
1) Oxygen/Argon	1.886	536422	0.113 ppm	Actual %D
2) Carbon monoxide	1.886	536422	N.D. ppm	
3) Methane (TCD)	4.059f	626500	66244.710 ppm	
4) Carbon dioxide	5.947	1163775	4957.948 ppm	5000 99.16
6) Methane (FID)	1.062	37290742	3947.023 ppm	
7) Ethylene	0.000	0	N.D. ppm	
8) Ethane	0.000	0	N.D. ppm	
9) Propylene	0.000	0	N.D. ppm	
10) Propane	0.000	0	N.D. ppm	
11) Isobutylene	0.000	0	N.D. ppm	
12) Isobutane	0.000	0	N.D. ppm	
13) n-Butane	0.000	0	N.D. ppm	

(f)=RT Delta > 1/2 Window

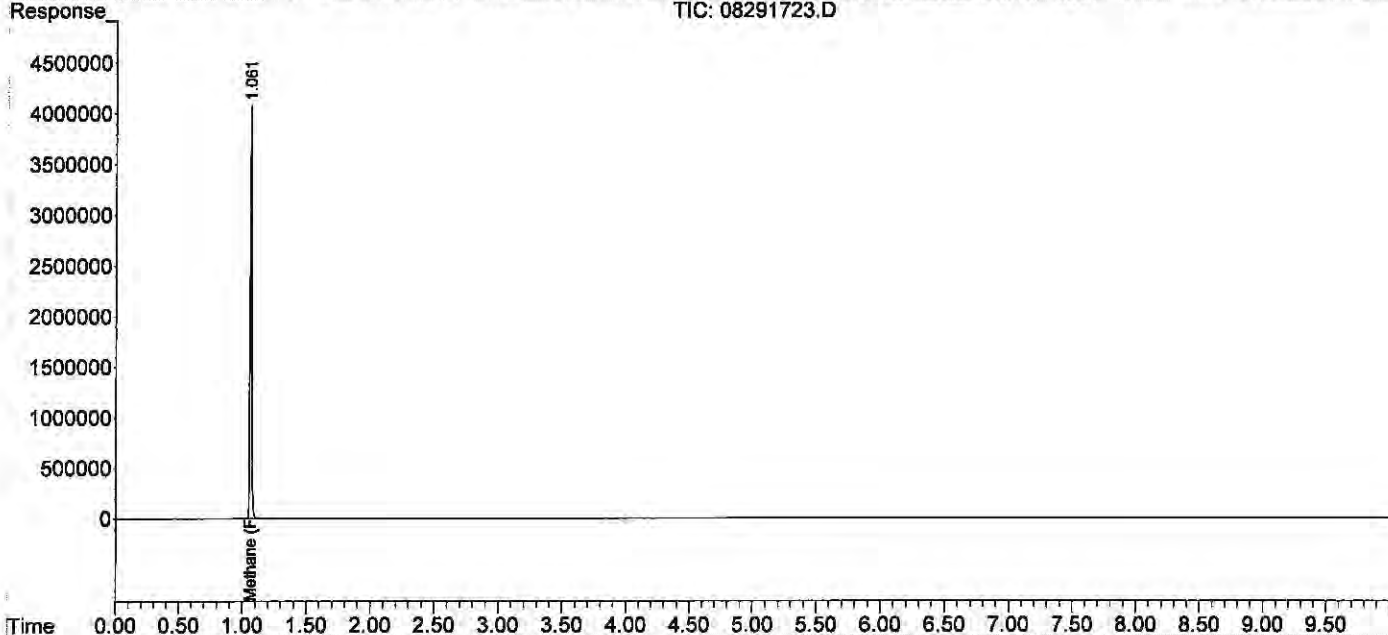
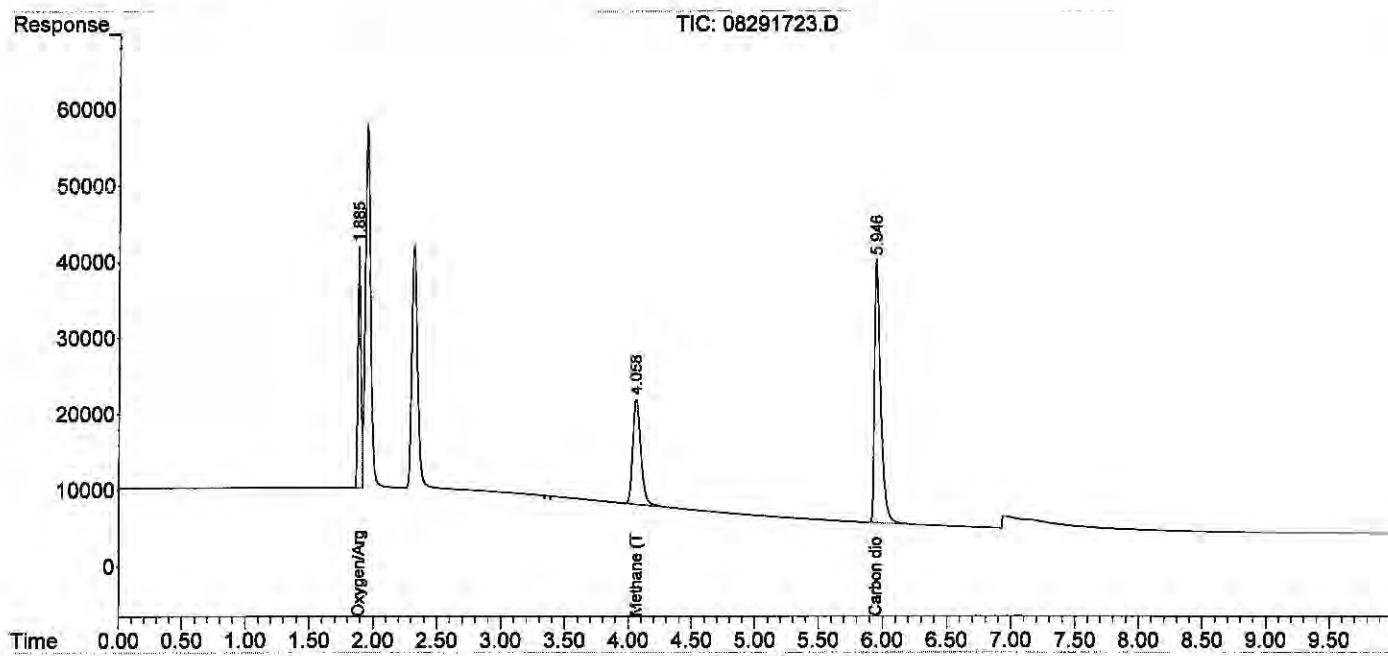
(m)=manual int.

W 9/4/17

Data Path : J:\GC10\DATA\RSK_FID\2017_08\29\
 Data File : 08291723.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 29-Aug-2017, 16:35
 Operator : MC
 Sample : icv s30-07071701
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Aug 29 16:54:07 2017
 Quant Method : I:\GC10\METHODS\RS082817_CO2.M
 Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 QLast Update : Tue Aug 29 16:13:13 2017
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :



ALS Environmental

Method : RSK175 Headspace Method for Dissolved Hydrocarbon in Water by FID/TCD

Client : ALS Laboratory Group

Analyst : WH

Service Request : P1904717 Date Analysis : 08/13/19

Sample Vol. (ml) : 32.00 ml Head Space Vol. (ml) : 8.00 ml

Instrument : GC#10

Detector : FID#10, TCD#10

Gas Constant : 24.05684 (20°C)

HEAD SPACE RESULT (ppm)

FINAL HEAD SPACE RESULT (ppm)

Sample ID	Ini. Vol.	Carbon Dioxide	WWL	Carbon Dioxide
std s32-06271901	0.100	5010.748		44.10
ACTUAL		5000.00		1.42E+03
%Difference		0.2%		100.00
MCS 0.1ml	0.100	0.000	MCS 0.1ml	0.000
RB 0.1ml	0.100	0.000		
LCS TCD	0.100	903.862	LCS TCD	9038.620
LCSD TCD	0.100	914.386	LCSD TCD	9143.860
p1904717-001 0.1ml	0.100	6444.801	p1904717-001 0.1ml	64448.010
p1904717-002 0.1ml	0.100	1902.701	p1904717-002 0.1ml	19027.010
p1904717-003 0.1ml	0.100	3339.046	p1904717-003 0.1ml	33390.460

STD s32-06271901
ACTUAL
%Difference

4550.171
5000.00
9.0%

Data Path : J:\GC10\DATA\RSK_FID\2019_08\13CO2\
 Data File : 08131901.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 13-Aug-2019, 11:16:08
 Operator : WH
 Sample : std s32-06271901
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Aug 13 11:41:50 2019
 Quant Method : I:\GC10\METHODS\RS082817_CO2.M
 Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 QLast Update : Tue Aug 29 16:13:13 2017
 Response via : Initial Calibration
 Integrator: ChemStation

W# 8/13/19

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :

Compound	R.T.	Response	Conc	Units

Target Compounds				
1) Oxygen/Argon	1.956f	1122305	0.236	ppm
2) Carbon monoxide	1.956f	1122305	N.D.	ppm
3) Methane (TCD)	0.000	0	N.D.	ppm
4) Carbon dioxide	6.044	1176169	5010.748	ppm m
6) Methane (FID)	0.000	0	N.D.	ppm
7) Ethylene	0.000	0	N.D.	ppm
8) Ethane	0.000	0	N.D.	ppm
9) Propylene	0.000	0	N.D.	ppm
10) Propane	0.000	0	N.D.	ppm
11) Isobutylene	0.000	0	N.D.	ppm
12) Isobutane	0.000	0	N.D.	ppm
13) n-Butane	0.000	0	N.D.	ppm

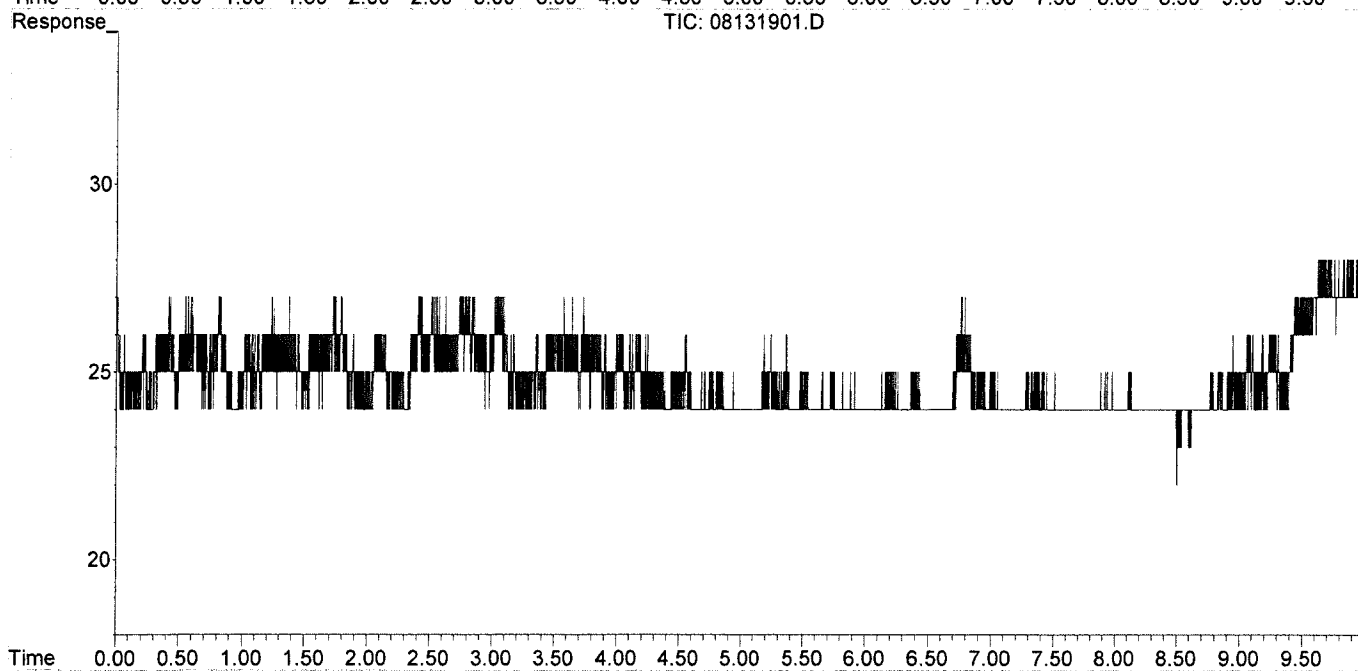
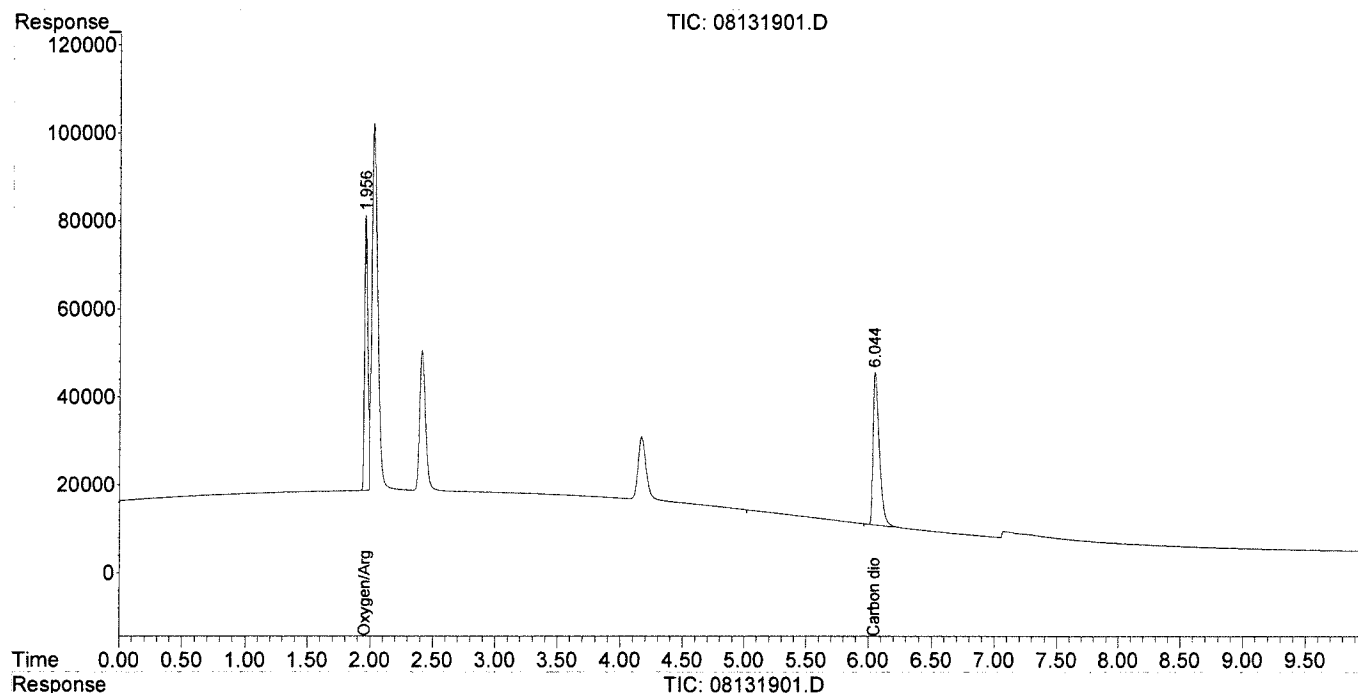
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2019_08\13CO2\
 Data File : 08131901.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 13-Aug-2019, 11:16:08
 Operator : WH
 Sample : std s32-06271901
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Aug 13 11:41:50 2019
 Quant Method : I:\GC10\METHODS\RS082817_CO2.M
 Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 QLast Update : Tue Aug 29 16:13:13 2017
 Response via : Initial Calibration
 Integrator: ChemStation

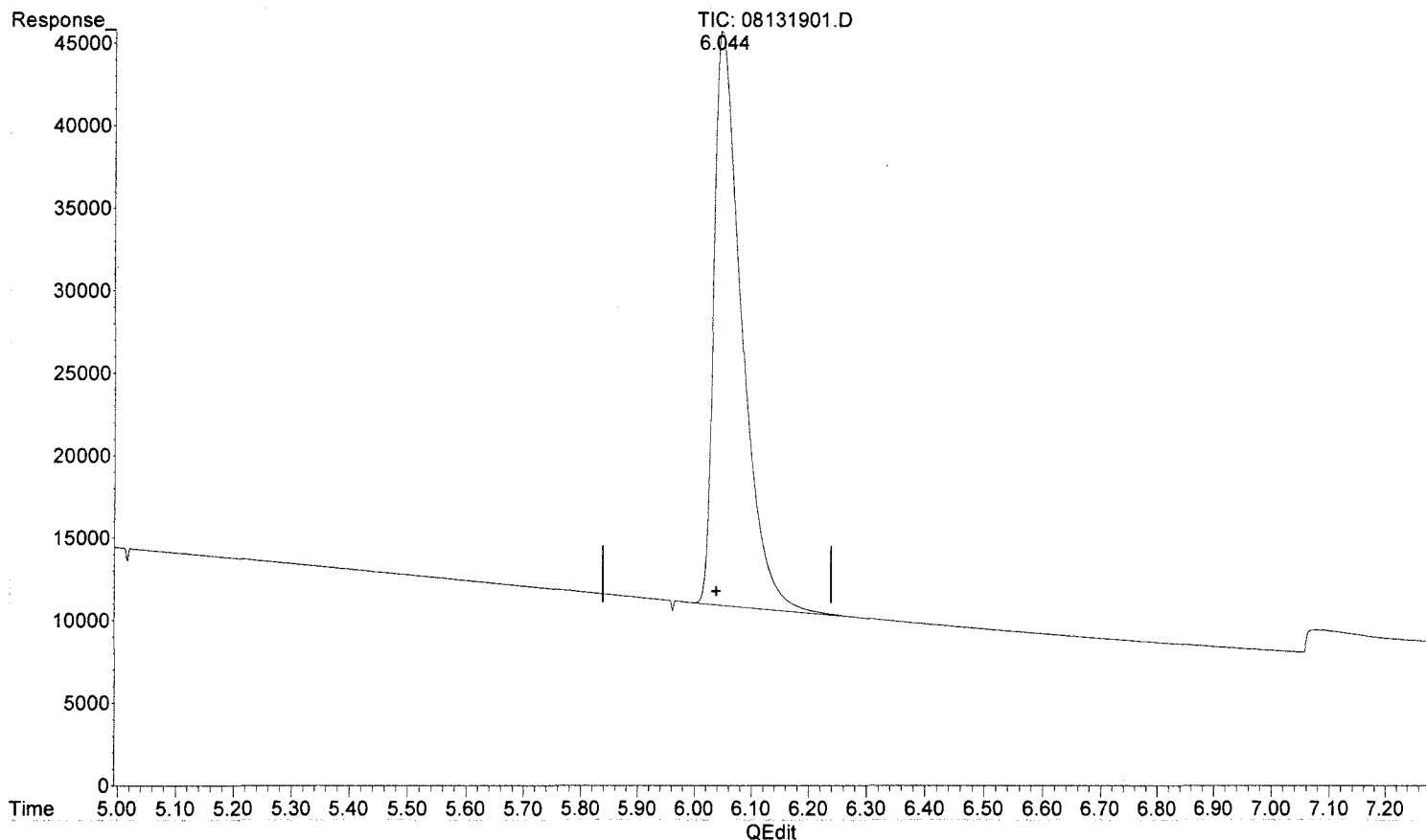
Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :



Data Path : J:\GC10\DATA\RSK_FID\2019_08\13CO2\
 Data File : 08131901.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 13-Aug-2019, 11:16:08
 Operator : WH
 Sample : std s32-06271901
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Aug 13 11:41:50 2019
 Quant Method : I:\GC10\METHODS\RS082817_CO2.M
 Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 QLast Update : Tue Aug 29 16:13:13 2017
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :



(4) Carbon dioxide
 6.044min 5010.748 ppm m
 response 1176169

*MP
8/14/19* *Wm StBla
BLC
w/ (fingerprint)*

Data Path : J:\GC10\DATA\RSK_FID\2019_08\13CO2\
 Data File : 08131914.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 13-Aug-2019, 15:39:25
 Operator : WH
 Sample : STD s32-06271901
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Aug 13 15:48:36 2019
 Quant Method : I:\GC10\METHODS\RS082817_CO2.M
 Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 QLast Update : Tue Aug 29 16:13:13 2017
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Oxygen/Argon	1.951f	1166042	0.245 ppm
2) Carbon monoxide	1.951f	1166042	N.D. ppm
3) Methane (TCD)	0.000	0	N.D. ppm
4) Carbon dioxide	6.048	1068058	4550.171 ppm m
6) Methane (FID)	0.000	0	N.D. ppm
7) Ethylene	0.000	0	N.D. ppm
8) Ethane	0.000	0	N.D. ppm
9) Propylene	0.000	0	N.D. ppm
10) Propane	0.000	0	N.D. ppm
11) Isobutylene	0.000	0	N.D. ppm
12) Isobutane	0.000	0	N.D. ppm
13) n-Butane	0.000	0	N.D. ppm

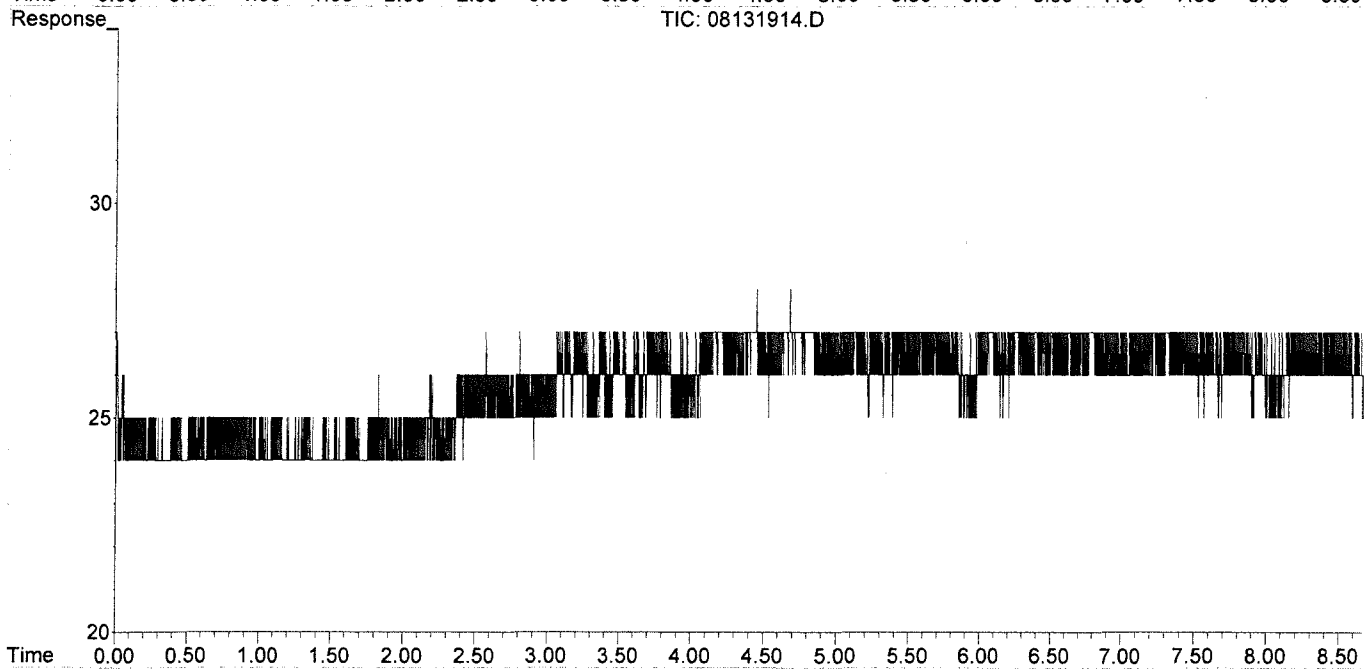
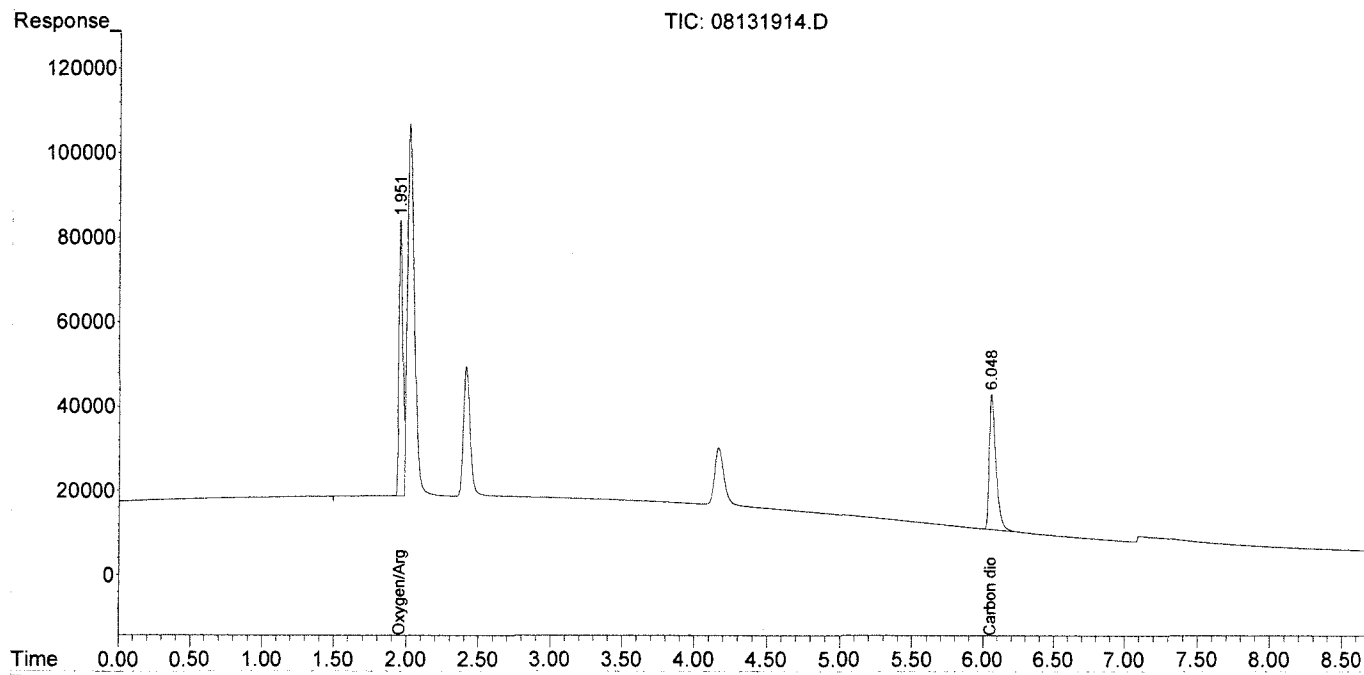
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2019_08\13CO2\
 Data File : 08131914.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 13-Aug-2019, 15:39:25
 Operator : WH
 Sample : STD s32-06271901
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Aug 13 15:48:36 2019
 Quant Method : I:\GC10\METHODS\RS082817_CO2.M
 Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 QLast Update : Tue Aug 29 16:13:13 2017
 Response via : Initial Calibration
 Integrator: ChemStation

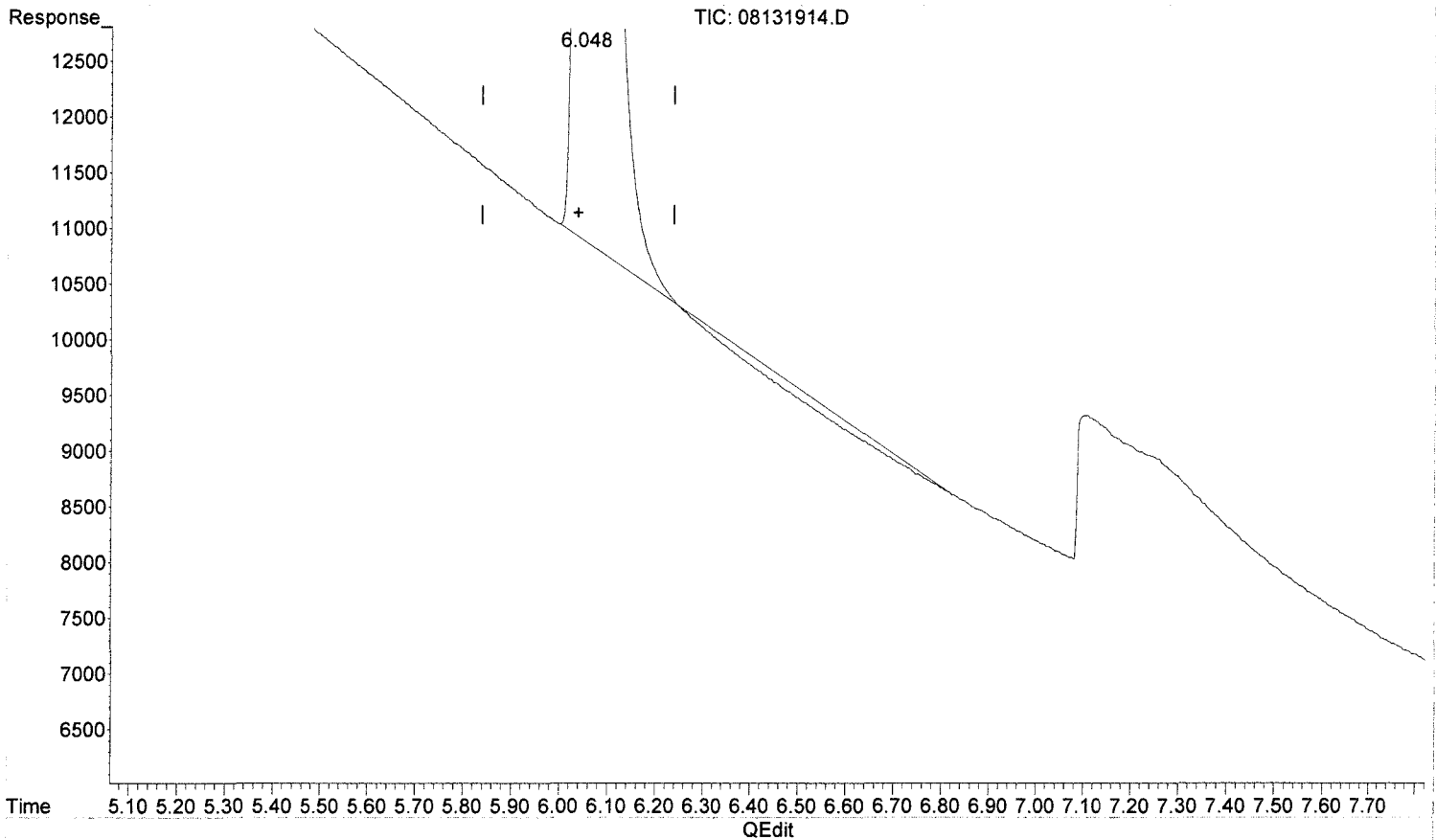
Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :



Data Path : J:\GC10\DATA\RSK_FID\2019_08\13CO2\
Data File : 08131914.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 13-Aug-2019, 15:39:25
Operator : WH
Sample : STD s32-06271901
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 13 15:48:36 2019
Quant Method : I:\GC10\METHODS\RS082817_CO2.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Tue Aug 29 16:13:13 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



(4) Carbon dioxide

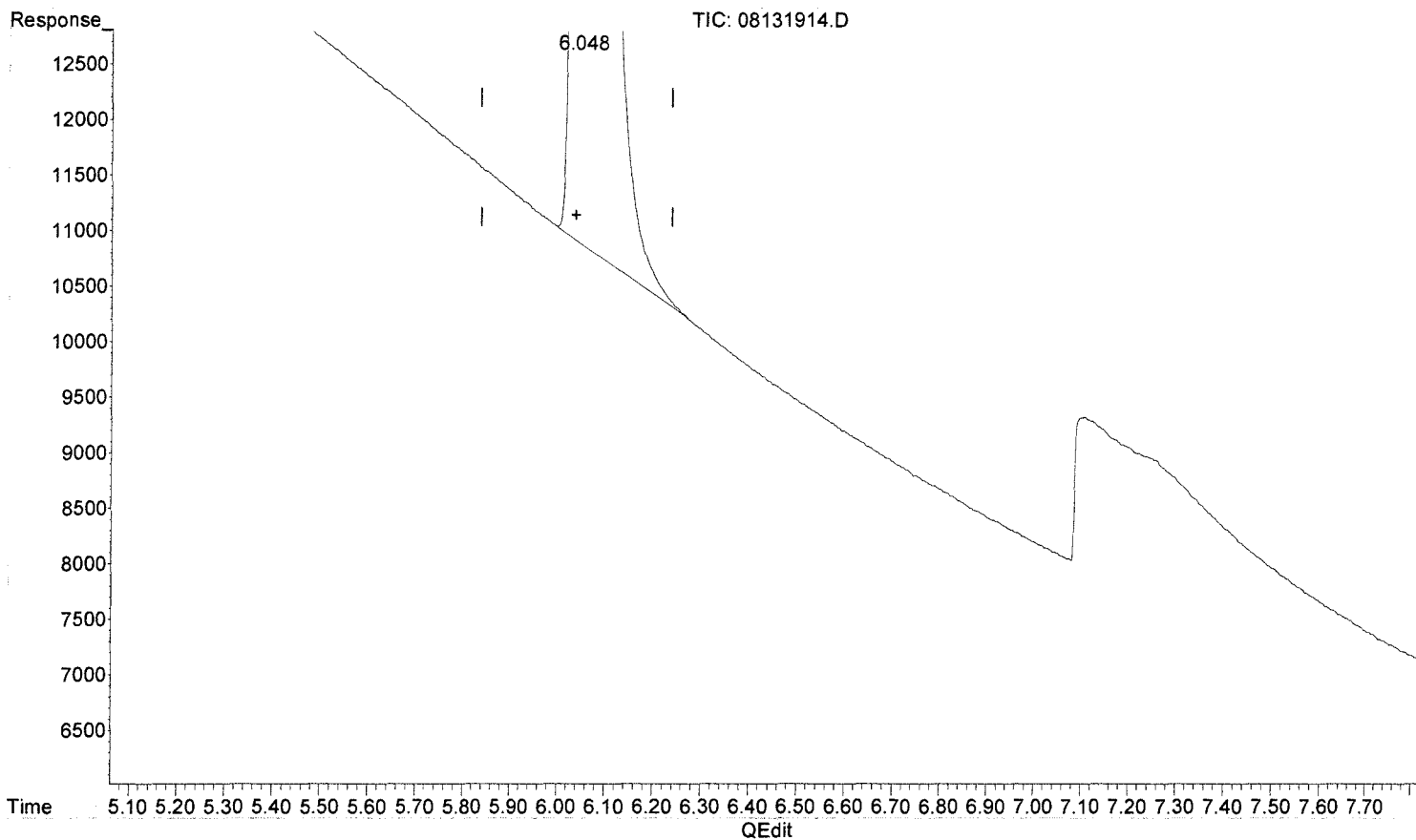
6.048min 4451.090 ppm

response 1044801

Data Path : J:\GC10\DATA\RSK_FID\2019_08\13CO2\
 Data File : 08131914.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 13-Aug-2019, 15:39:25
 Operator : WH
 Sample : STD s32-06271901
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Aug 13 15:48:36 2019
 Quant Method : I:\GC10\METHODS\RS082817_CO2.M
 Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 QLast Update : Tue Aug 29 16:13:13 2017
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :



(4) Carbon dioxide
 6.048min 4550.171 ppm m
 response 1068058

*ME
8/14/19*

*WH 8/13/19
BVC*

Injection Log

00957126

Directory: I:\GC10\DATA\RSK_FID\2017_08\29\

	Date/Time	File Name	Sample ID	Misc Info	Operator	Acquisition Method	Comments
1	29-Aug-17, 07:58:00	08291701.D	std s30-06161601		MC	RSKBOTH.M	Pass
2	29-Aug-17, 08:11:02	08291702.D	mb 0.5ml		MC	RSKBOTH.M	Pass
3	29-Aug-17, 08:24:13	08291703.D	4089-001 0.5ml		MC	RSKBOTH.M	
4	29-Aug-17, 08:39:29	08291704.D	4089-002 0.5ml		MC	RSKBOTH.M	
5	29-Aug-17, 08:53:38	08291705.D	4089-003 0.5ml		MC	RSKBOTH.M	
6	29-Aug-17, 09:33:52	08291706.D	4089-004 0.5ml		MC	RSKBOTH.M	
7	29-Aug-17, 09:50:51	08291707.D	4089-005 0.5ml		MC	RSKBOTH.M	
8	29-Aug-17, 10:07:54	08291708.D	4089-006 0.5ml		MC	RSKBOTH.M	
9	29-Aug-17, 10:42:34	08291709.D	4089-007 0.5ml		MC	RSKBOTH.M	
10	29-Aug-17, 11:06:01	08291710.D	4089-008 0.5ml		MC	RSKBOTH.M	
11	29-Aug-17, 11:23:53	08291711.D	4089-009 0.5ml		MC	RSKBOTH.M	
12	29-Aug-17, 11:37:17	08291712.D	lcs s30-05241604		MC	RSKBOTH.M	Pass
13	29-Aug-17, 11:50:31	08291713.D	lcs s30-05241604		MC	RSKBOTH.M	Pass
14	29-Aug-17, 12:29:45	08291714.D	std s30-06161601		MC	RSKBOTH.M	Pass
15	29-Aug-17, 14:07:01	08291715.D	25ppm s32-08291701 0.25ml		MC	RSKBOTH.M	Curve
16	29-Aug-17, 14:22:12	08291716.D	100ppm s32-08291702 0.2ml		MC	RSKBOTH.M	Curve
17	29-Aug-17, 14:53:00	08291717.D	250ppm s32-08291702 0.5ml		MC	RSKBOTH.M	Curve
18	29-Aug-17, 15:07:43	08291718.D	mis Inject		MC	RSKBOTH.M	
19	29-Aug-17, 15:23:21	08291719.D	2500ppm s32-08231701 50ul		MC	RSKBOTH.M	Curve
20	29-Aug-17, 15:44:54	08291720.D	5000ppm s32-08231701 0.1ml		MC	RSKBOTH.M	Curve
21	29-Aug-17, 16:00:09	08291721.D	25000ppm s32-08231701 0.5ml		MC	RSKBOTH.M	Curve
22	29-Aug-17, 16:15:43	08291722.D	mb 0.1ml		MC	RSKBOTH.M	Pass
23	29-Aug-17, 16:35:37	08291723.D	lcv s30-07071701		MC	RSKBOTH.M	Pass

Injection Log

Directory: I:\GC10\DATA\RSK_TCD\2019_08\13\

	Date/Time	File Name	Sample ID	Misc Info	Operator	Acquisition Method	Comments
1	13-Aug-19, 11:16:08	08131901.D	std s32-06271901		WH	RSKBOTH.M	
2	13-Aug-19, 11:43:23	08131902.D	RB 0.1 ml		WH	RSKBOTH.M	
3	13-Aug-19, 12:01:26	08131903.D	MCS 0.1 ml		WH	RSKBOTH.M	
4	13-Aug-19, 12:25:01	08131904.D	xLCS TCD		WH	RSKBOTH.M	
5	13-Aug-19, 12:36:48	08131905.D	LCS TCD		WH	RSKBOTH.M	
6	13-Aug-19, 12:48:06	08131906.D	LCS D TCD		WH	RSKBOTH.M	
7	13-Aug-19, 13:56:48	08131907.D	p1904674-001 0.1 ml		WH	RSKBOTH.M	
8	13-Aug-19, 14:13:47	08131908.D	p1904674-002 0.1 ml		WH	RSKBOTH.M	
9	13-Aug-19, 14:26:54	08131909.D	p1904674-003 0.1 ml		WH	RSKBOTH.M	
10	13-Aug-19, 14:36:36	08131910.D	p1904674-004 0.1 ml		WH	RSKBOTH.M	
11	13-Aug-19, 14:49:05	08131911.D	p1904717-001 0.1 ml		WH	RSKBOTH.M	
12	13-Aug-19, 15:00:41	08131912.D	p1904717-002 0.1 ml		WH	RSKBOTH.M	
13	13-Aug-19, 15:24:57	08131913.D	p1904717-003 0.1 ml		WH	RSKBOTH.M	
14	13-Aug-19, 15:39:25	08131914.D	STD s32-06271901		WH	RSKBOTH.M	

Data Path : J:\GC10\DATA\RSK_FID\2019_08\14\
 Data File : 08141906.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 14-Aug-2019, 12:04:18
 Operator : WH
 Sample : P1904717-001 0.1ml
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Aug 14 12:17:29 2019
 Quant Method : I:\GC10\METHODS\RS091217_R.M
 Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 QLast Update : Wed Sep 13 11:14:47 2017
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :

Compound	R.T.	Response	Conc	Units

Target Compounds				
1) Oxygen/Argon	0.000	0	N.D.	ppm
2) Carbon monoxide	0.000	0	N.D.	ppm
3) Methane (TCD)	0.000	0	N.D.	ppm
4) Carbon dioxide	0.000	0	N.D.	ppm
6) Methane (FID)	1.113	609	0.067	ppm m
7) Ethylene	0.000	0	N.D.	ppm
8) Ethane	0.000	0	N.D.	ppm
9) Propylene	0.000	0	N.D.	ppm
10) Propane	0.000	0	N.D.	ppm
11) Isobutylene	0.000	0	N.D.	ppm
12) Isobutane	0.000	0	N.D.	ppm
13) n-Butane	0.000	0	N.D.	ppm

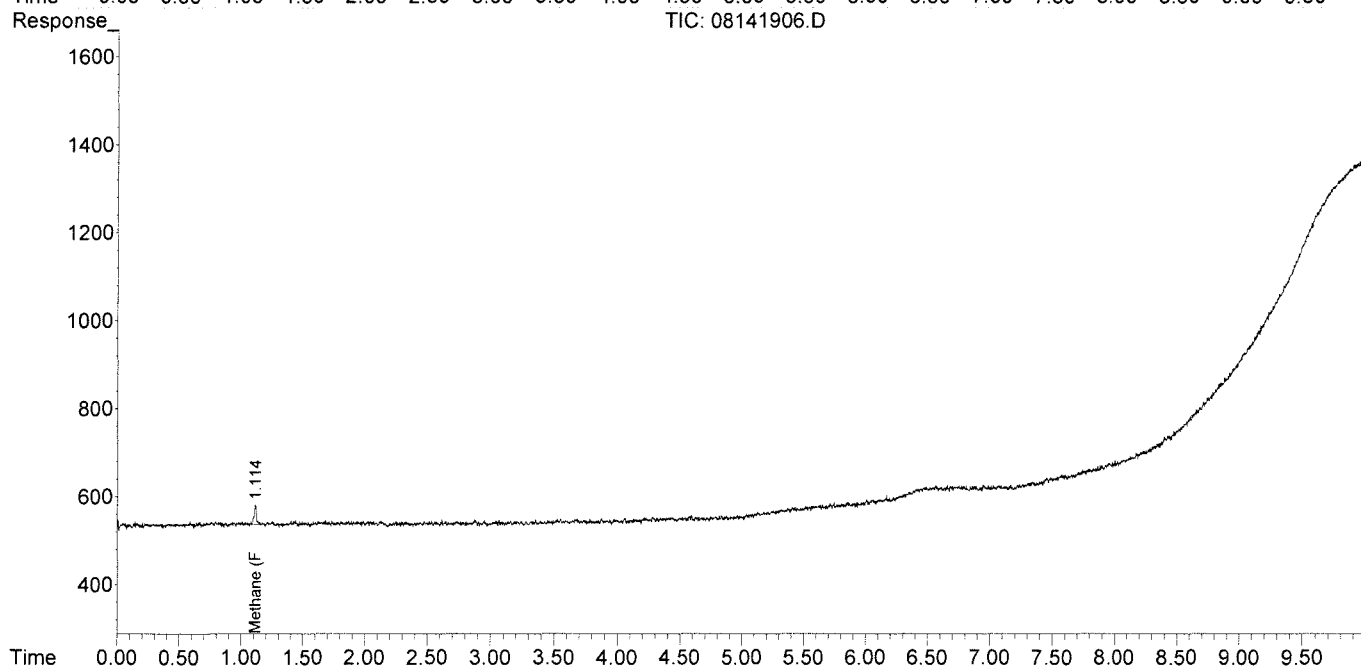
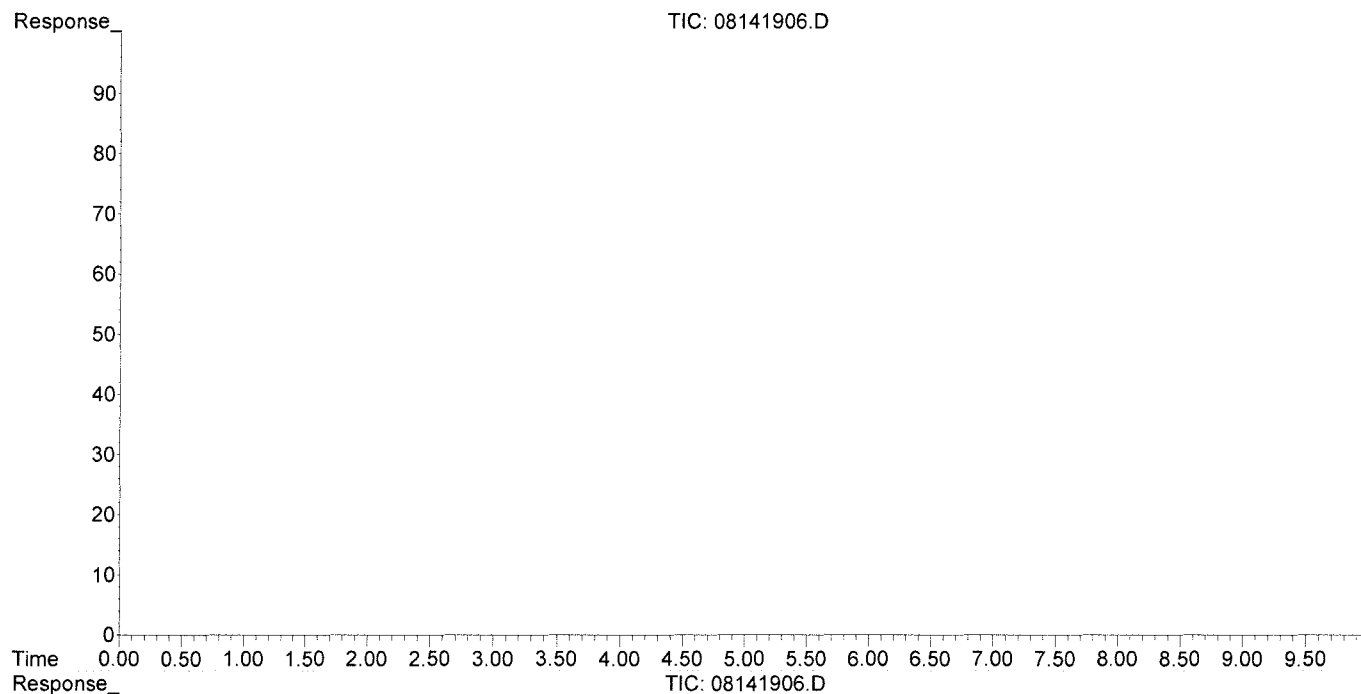
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2019_08\14\
Data File : 08141906.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 14-Aug-2019, 12:04:18
Operator : WH
Sample : P1904717-001 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 14 12:17:29 2019
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

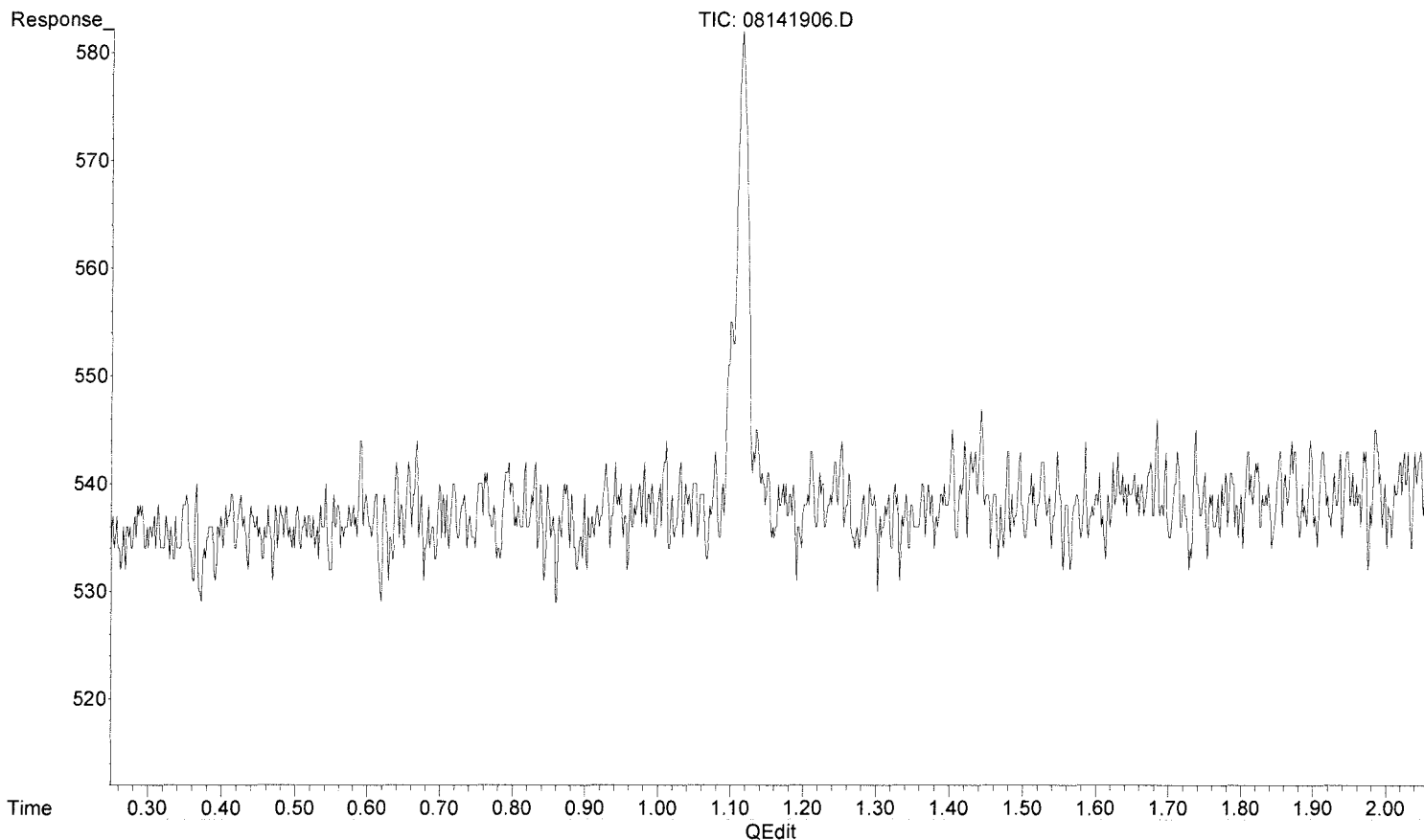
Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



Data Path : J:\GC10\DATA\RSK_FID\2019_08\14\
Data File : 08141906.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 14-Aug-2019, 12:04:18
Operator : WH
Sample : P1904717-001 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 14 12:17:29 2019
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



(6) Methane (FID)

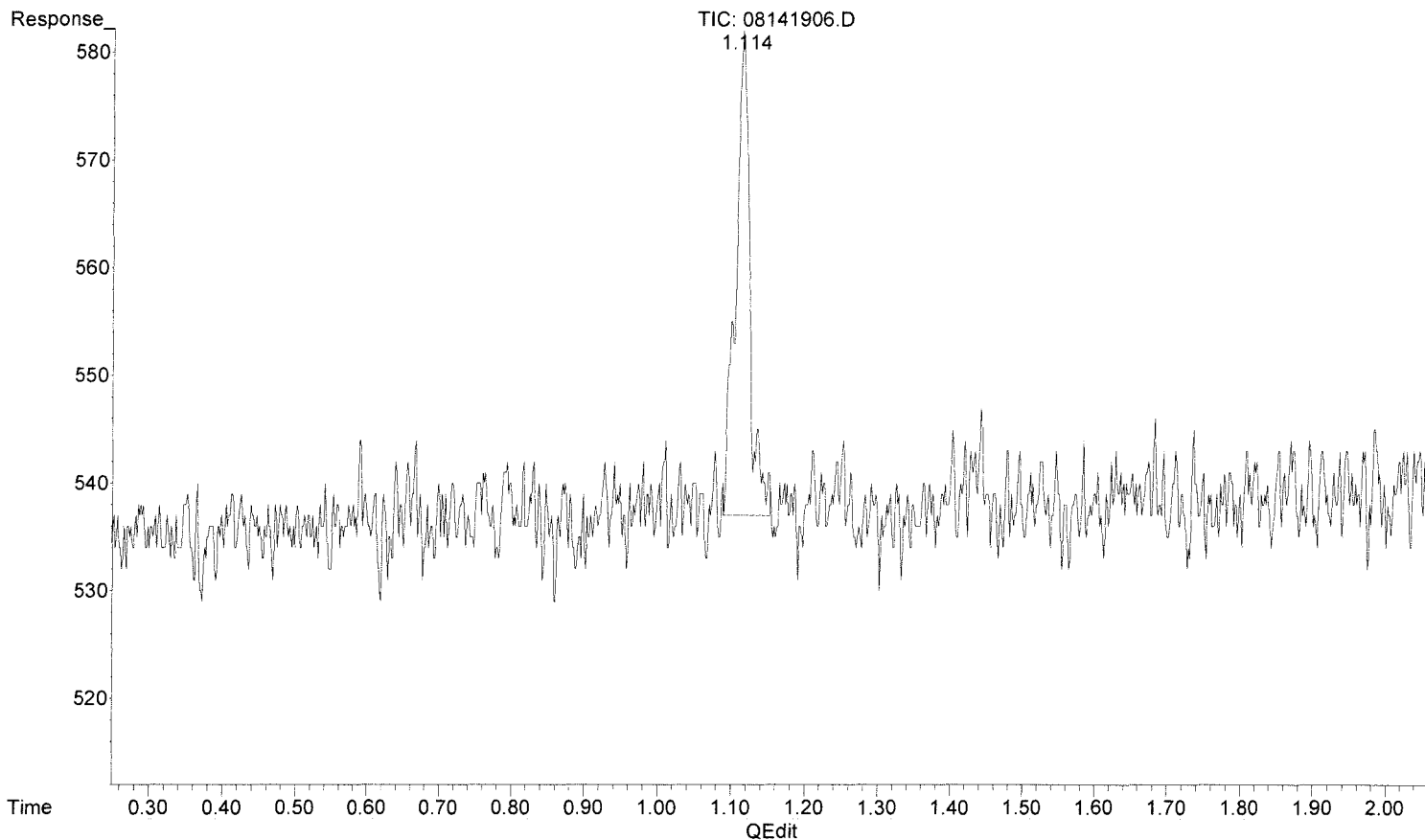
1.115min 0.000 ppm

response 0

Data Path : J:\GC10\DATA\RSK_FID\2019_08\14\
Data File : 08141906.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 14-Aug-2019, 12:04:18
Operator : WH
Sample : P1904717-001 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 14 12:17:29 2019
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



(6) Methane (FID)
1.113min 0.067 ppm m
response 609

MR
8/14/19

Long / 8/14/19
MR

Data Path : J:\GC10\DATA\RSK_FID\2019_08\14\
 Data File : 08141907.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 14-Aug-2019, 12:18:46
 Operator : WH
 Sample : P1904717-002 0.1ml
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Aug 14 13:01:25 2019
 Quant Method : I:\GC10\METHODS\RS091217_R.M
 Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 QLast Update : Wed Sep 13 11:14:47 2017
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :

Compound	R.T.	Response	Conc	Units

Target Compounds				
1) Oxygen/Argon	0.000	0	N.D.	ppm
2) Carbon monoxide	0.000	0	N.D.	ppm
3) Methane (TCD)	0.000	0	N.D.	ppm
4) Carbon dioxide	0.000	0	N.D.	ppm
6) Methane (FID)	1.106	21939	2.419	ppm
7) Ethylene	0.000	0	N.D.	ppm
8) Ethane	0.000	0	N.D.	ppm
9) Propylene	0.000	0	N.D.	ppm
10) Propane	0.000	0	N.D.	ppm
11) Isobutylene	0.000	0	N.D.	ppm
12) Isobutane	0.000	0	N.D.	ppm
13) n-Butane	0.000	0	N.D.	ppm

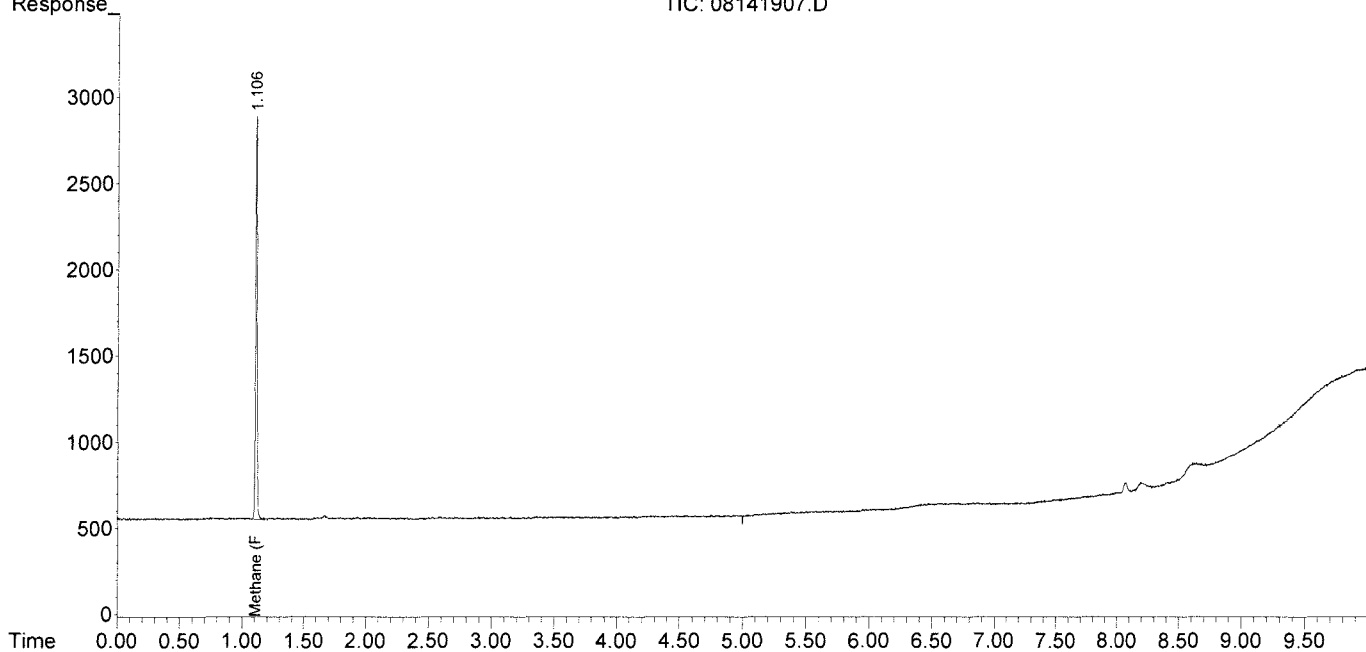
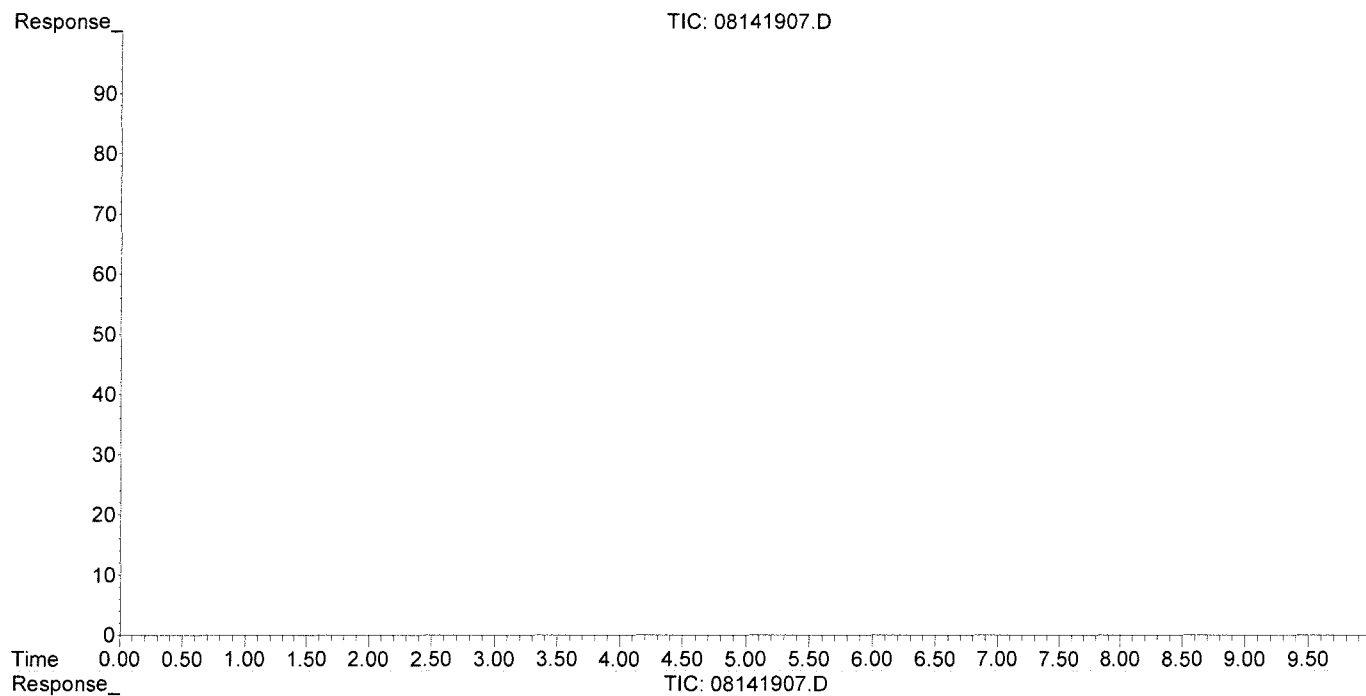
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2019_08\14\
Data File : 08141907.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 14-Aug-2019, 12:18:46
Operator : WH
Sample : P1904717-002 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 14 13:01:25 2019
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



Data Path : J:\GC10\DATA\RSK_FID\2019_08\14\
 Data File : 08141908.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 14-Aug-2019, 12:32:31
 Operator : WH
 Sample : P1904717-003 0.1ml
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Aug 14 13:01:43 2019
 Quant Method : I:\GC10\METHODS\RS091217_R.M
 Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 QLast Update : Wed Sep 13 11:14:47 2017
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :

Compound	R.T.	Response	Conc	Units

Target Compounds				
1) Oxygen/Argon	0.000	0	N.D.	ppm
2) Carbon monoxide	0.000	0	N.D.	ppm
3) Methane (TCD)	0.000	0	N.D.	ppm
4) Carbon dioxide	0.000	0	N.D.	ppm
6) Methane (FID)	1.111	527	0.058	ppm m
7) Ethylene	0.000	0	N.D.	ppm
8) Ethane	0.000	0	N.D.	ppm
9) Propylene	0.000	0	N.D.	ppm
10) Propane	0.000	0	N.D.	ppm
11) Isobutylene	0.000	0	N.D.	ppm
12) Isobutane	0.000	0	N.D.	ppm
13) n-Butane	0.000	0	N.D.	ppm

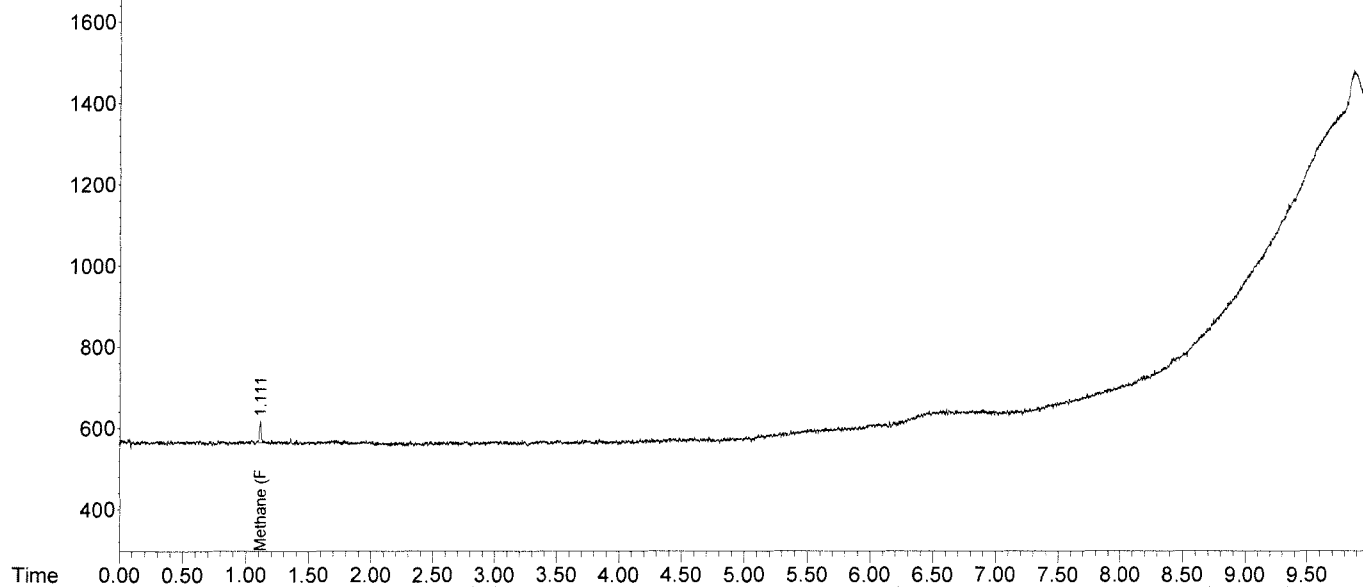
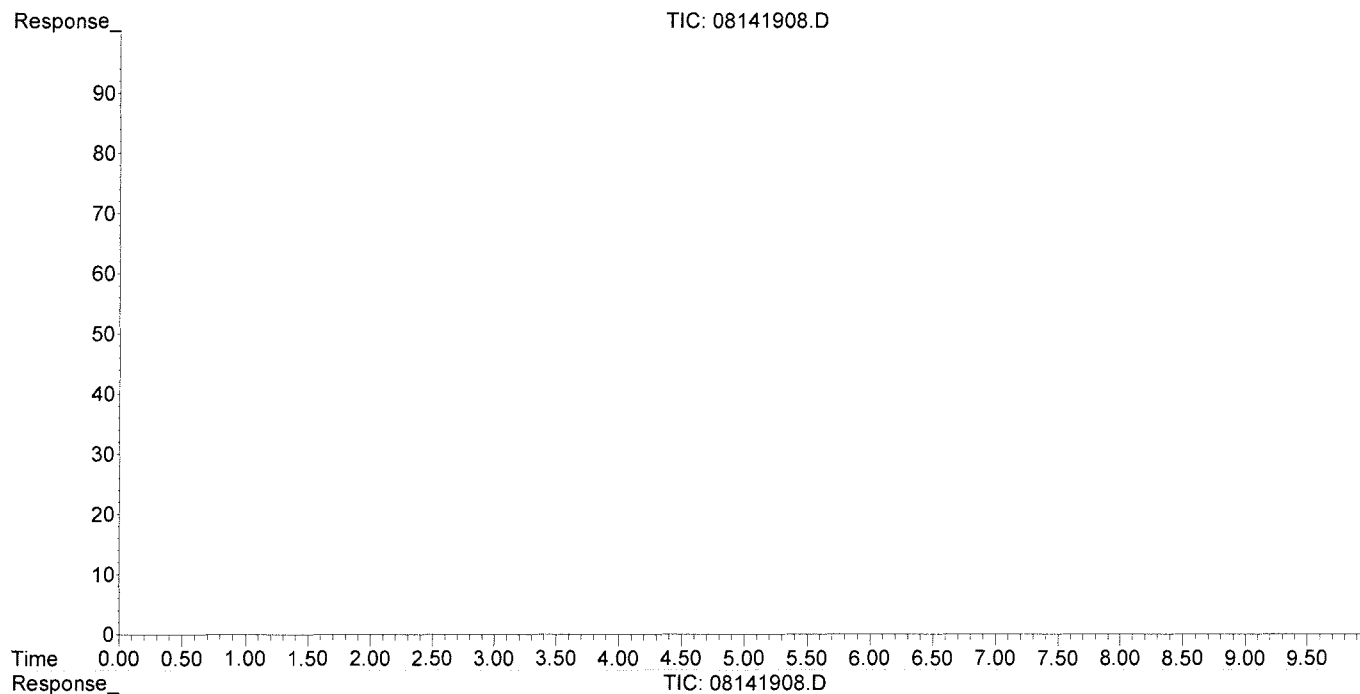
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2019_08\14\
Data File : 08141908.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 14-Aug-2019, 12:32:31
Operator : WH
Sample : P1904717-003 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 14 13:01:43 2019
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

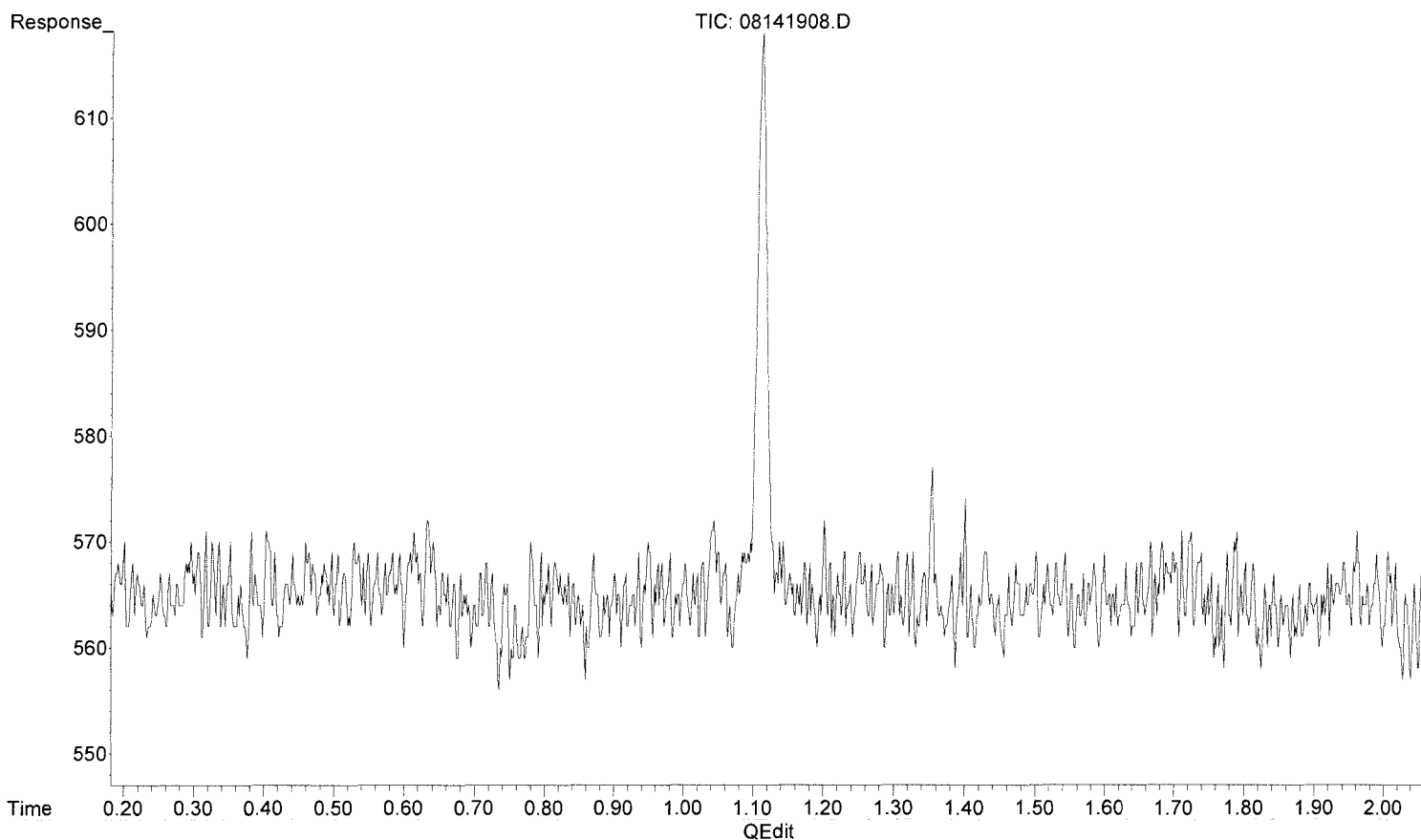
Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



Data Path : J:\GC10\DATA\RSK_FID\2019_08\14\
Data File : 08141908.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 14-Aug-2019, 12:32:31
Operator : WH
Sample : P1904717-003 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 14 13:01:43 2019
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

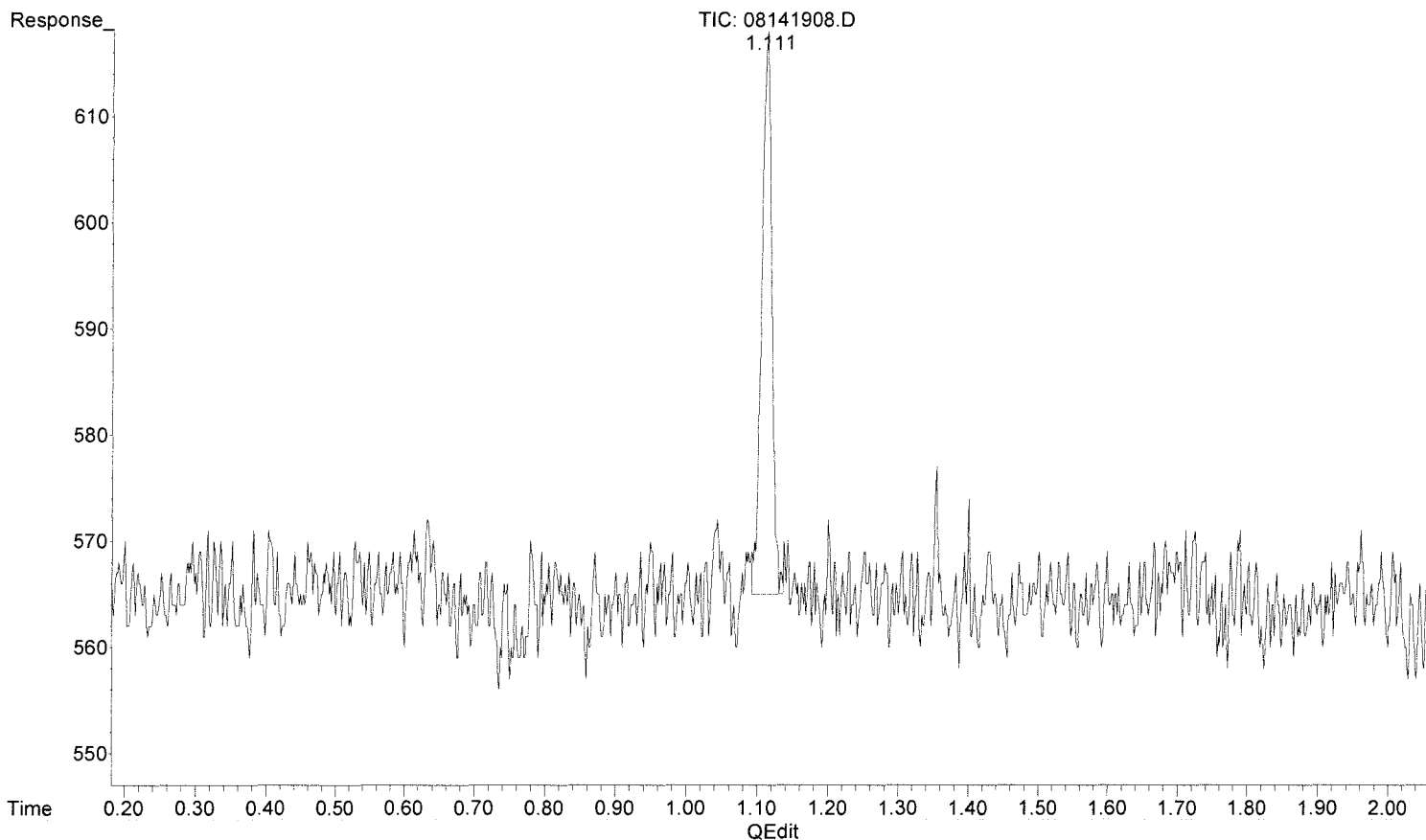


(6) Methane (FID)
1.115min 0.000 ppm
response 0

Data Path : J:\GC10\DATA\RSK_FID\2019_08\14\
Data File : 08141908.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 14-Aug-2019, 12:32:31
Operator : WH
Sample : P1904717-003 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 14 13:01:43 2019
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



(6) Methane (FID)

1.111min 0.058 ppm m

response 527

MP
8/14/19

WH
8/14/19
MP

Data Path : J:\GC10\DATA\RSK_FID\2019_08\14\
 Data File : 08141903.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 14-Aug-2019, 11:18:19
 Operator : WH
 Sample : MCS 0.1ml
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Aug 14 13:00:12 2019
 Quant Method : I:\GC10\METHODS\RS091217_R.M
 Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 QLast Update : Wed Sep 13 11:14:47 2017
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :

Compound	R.T.	Response	Conc	Units

Target Compounds				
1) Oxygen/Argon	0.000	0	N.D.	ppm
2) Carbon monoxide	0.000	0	N.D.	ppm
3) Methane (TCD)	0.000	0	N.D.	ppm
4) Carbon dioxide	0.000	0	N.D.	ppm
6) Methane (FID)	1.102	889	0.098	ppm
7) Ethylene	0.000	0	N.D.	ppm
8) Ethane	0.000	0	N.D.	ppm
9) Propylene	0.000	0	N.D.	ppm
10) Propane	0.000	0	N.D.	ppm
11) Isobutylene	0.000	0	N.D.	ppm
12) Isobutane	0.000	0	N.D.	ppm
13) n-Butane	0.000	0	N.D.	ppm

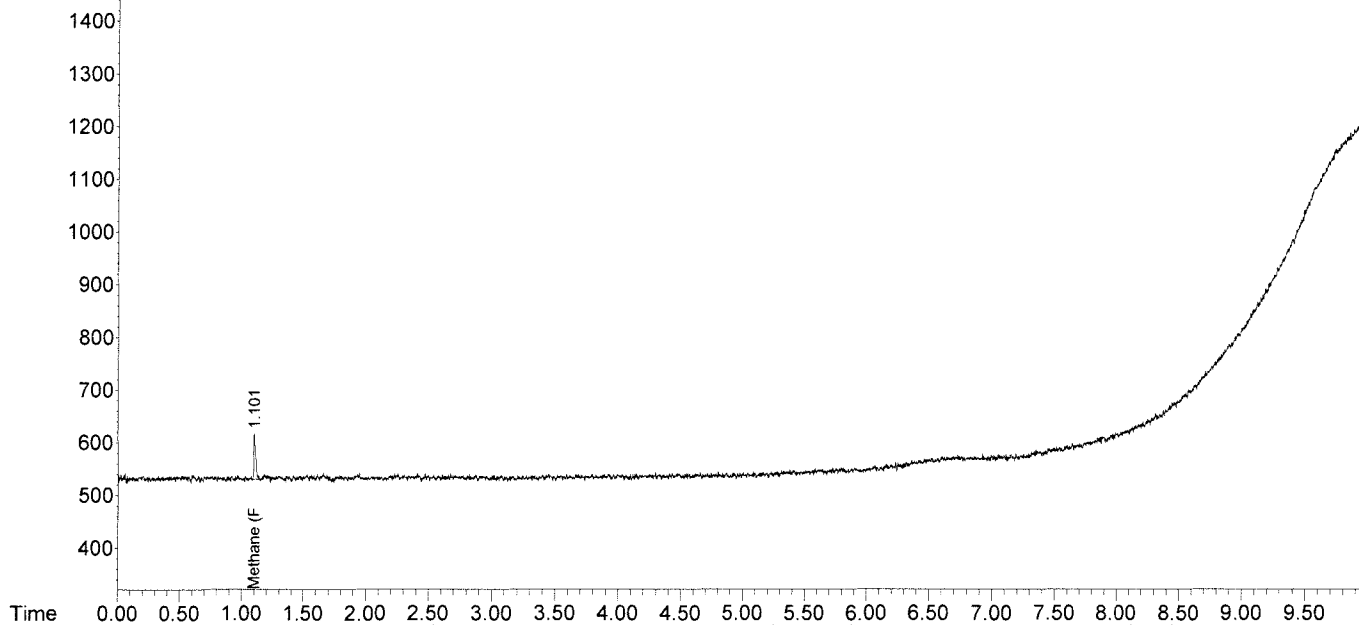
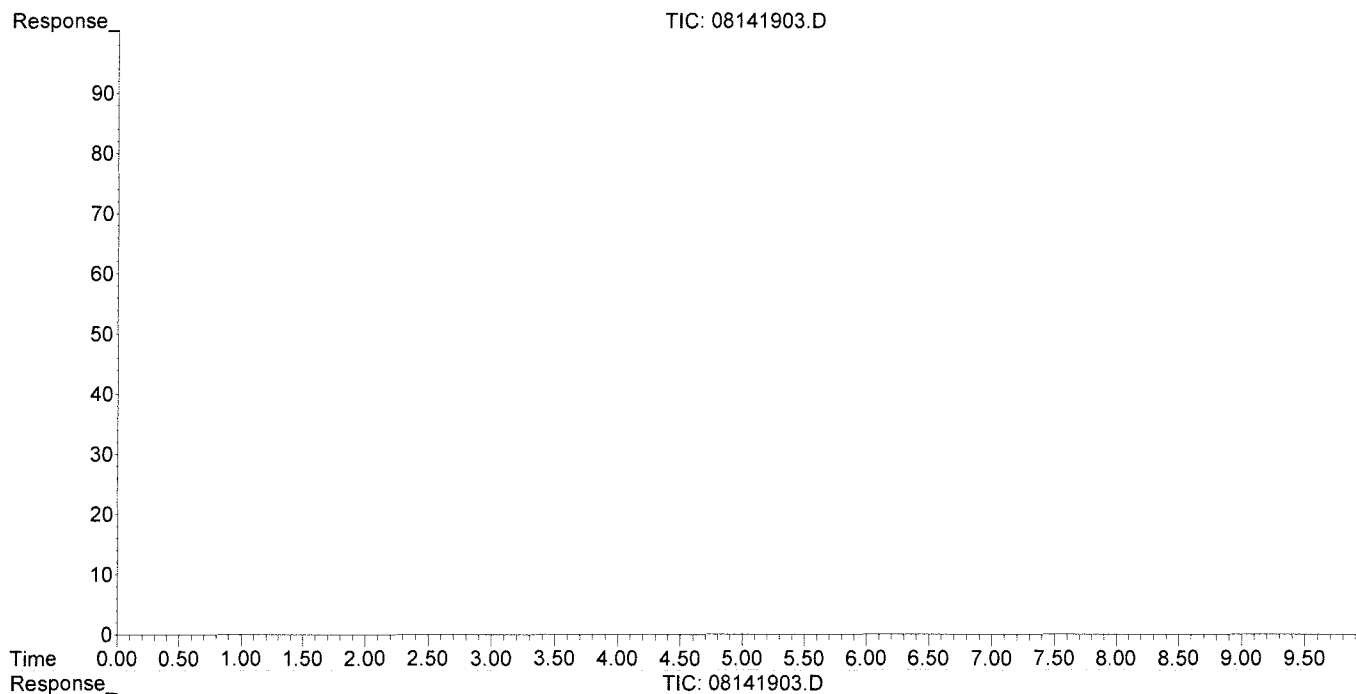
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2019_08\14\
Data File : 08141903.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 14-Aug-2019, 11:18:19
Operator : WH
Sample : MCS 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 14 13:00:12 2019
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



Data Path : J:\GC10\DATA\RSK_FID\2019_08\14\
 Data File : 08141904.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 14-Aug-2019, 11:31:11
 Operator : WH
 Sample : FID LCS 0.1ml
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Aug 14 12:11:47 2019
 Quant Method : I:\GC10\METHODS\RS091217_R.M
 Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 QLast Update : Wed Sep 13 11:14:47 2017
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :

Compound	R.T.	Response	Conc	Units

Target Compounds				
1) Oxygen/Argon	0.000	0	N.D.	ppm
2) Carbon monoxide	0.000	0	N.D.	ppm
3) Methane (TCD)	0.000	0	N.D.	ppm
4) Carbon dioxide	0.000	0	N.D.	ppm
6) Methane (FID)	1.093	12996	1.433	ppm
7) Ethylene	1.636	16468	0.984	ppm
8) Ethane	1.892	20954	1.236	ppm
9) Propylene	4.290	22463	0.959	ppm
10) Propane	4.414	32749	1.316	ppm
11) Isobutylene	0.000	0	N.D.	ppm
12) Isobutane	6.649	43390	1.630	ppm
13) n-Butane	6.649	43390	1.630	ppm

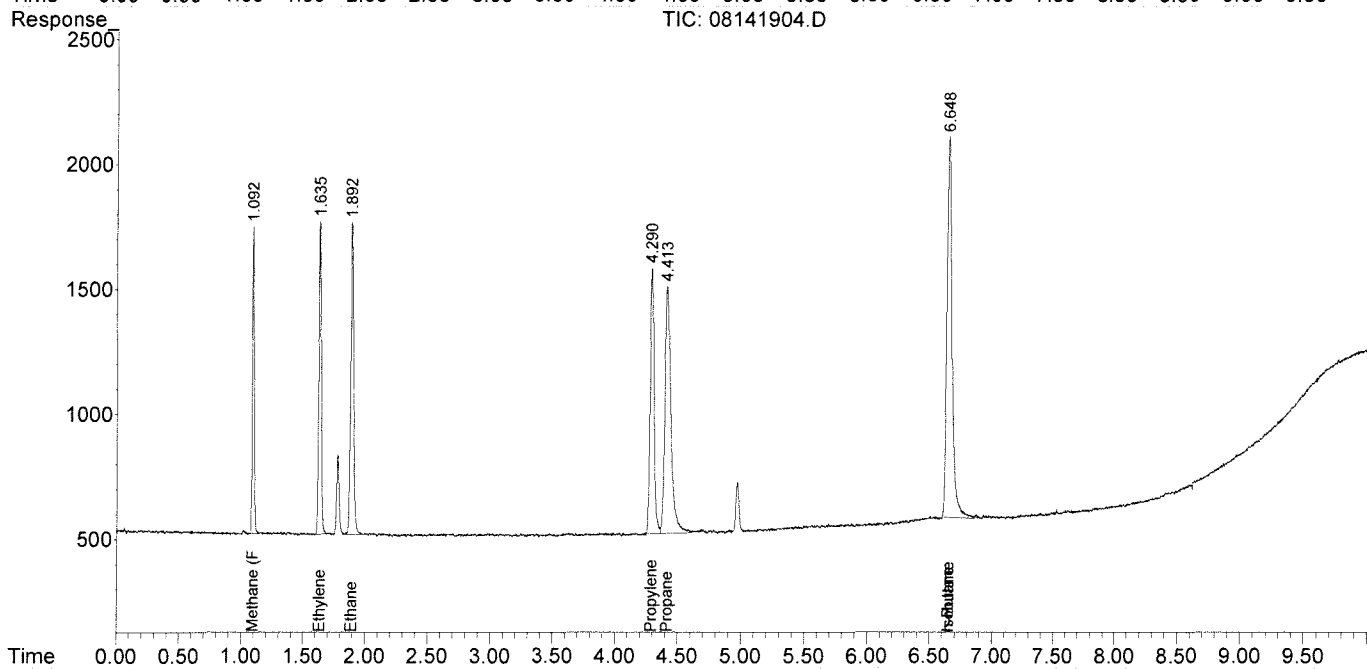
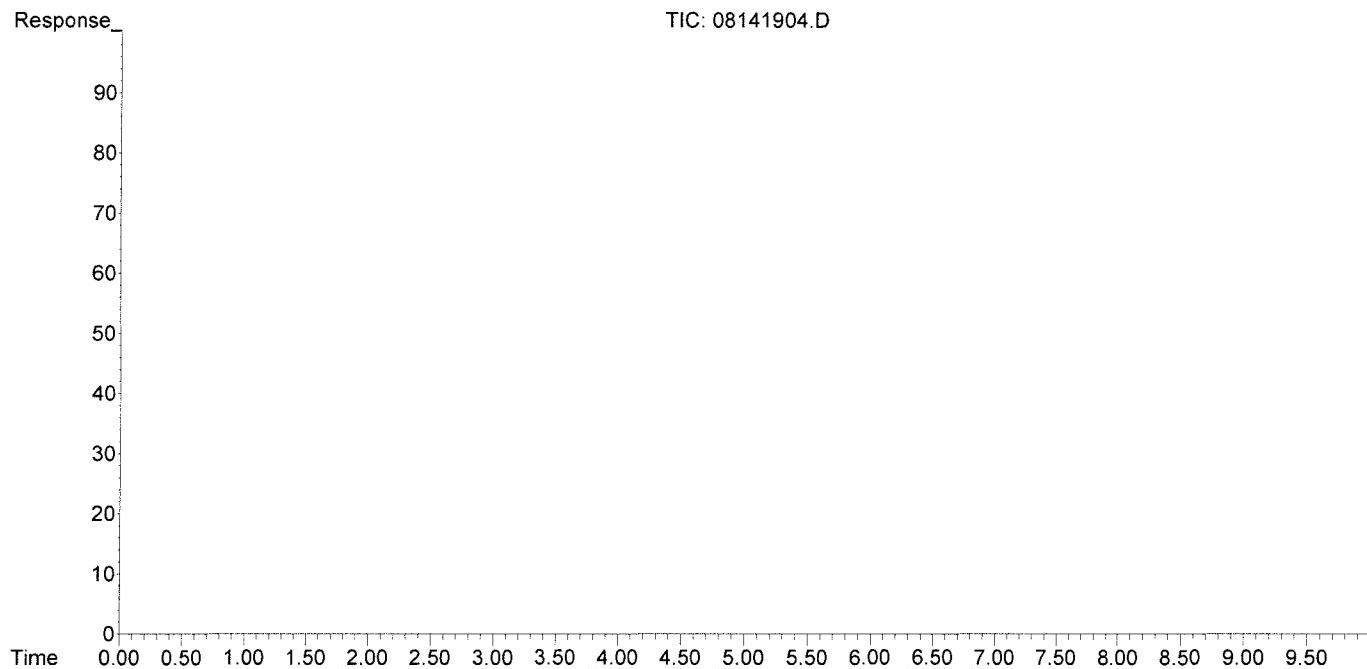
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2019_08\14\
 Data File : 08141904.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 14-Aug-2019, 11:31:11
 Operator : WH
 Sample : FID LCS 0.1ml
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Aug 14 12:11:47 2019
 Quant Method : I:\GC10\METHODS\RS091217_R.M
 Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 QLast Update : Wed Sep 13 11:14:47 2017
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :



Data Path : J:\GC10\DATA\RSK_FID\2019_08\14\
 Data File : 08141905.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 14-Aug-2019, 11:46:24
 Operator : WH
 Sample : FID LCSD 0.1ml
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Aug 14 12:12:01 2019
 Quant Method : I:\GC10\METHODS\RS091217_R.M
 Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 QLast Update : Wed Sep 13 11:14:47 2017
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :

Compound	R.T.	Response	Conc	Units

Target Compounds				
1) Oxygen/Argon	0.000	0	N.D.	ppm
2) Carbon monoxide	0.000	0	N.D.	ppm
3) Methane (TCD)	0.000	0	N.D.	ppm
4) Carbon dioxide	0.000	0	N.D.	ppm
6) Methane (FID)	1.112	12618	1.391	ppm
7) Ethylene	1.674	16769	1.002	ppm
8) Ethane	1.936	21263	1.254	ppm
9) Propylene	4.313	22766	0.972	ppm
10) Propane	4.435	33396	1.342	ppm
11) Isobutylene	0.000	0	N.D.	ppm
12) Isobutane	6.650	46109	1.732	ppm
13) n-Butane	6.650	46109	1.732	ppm

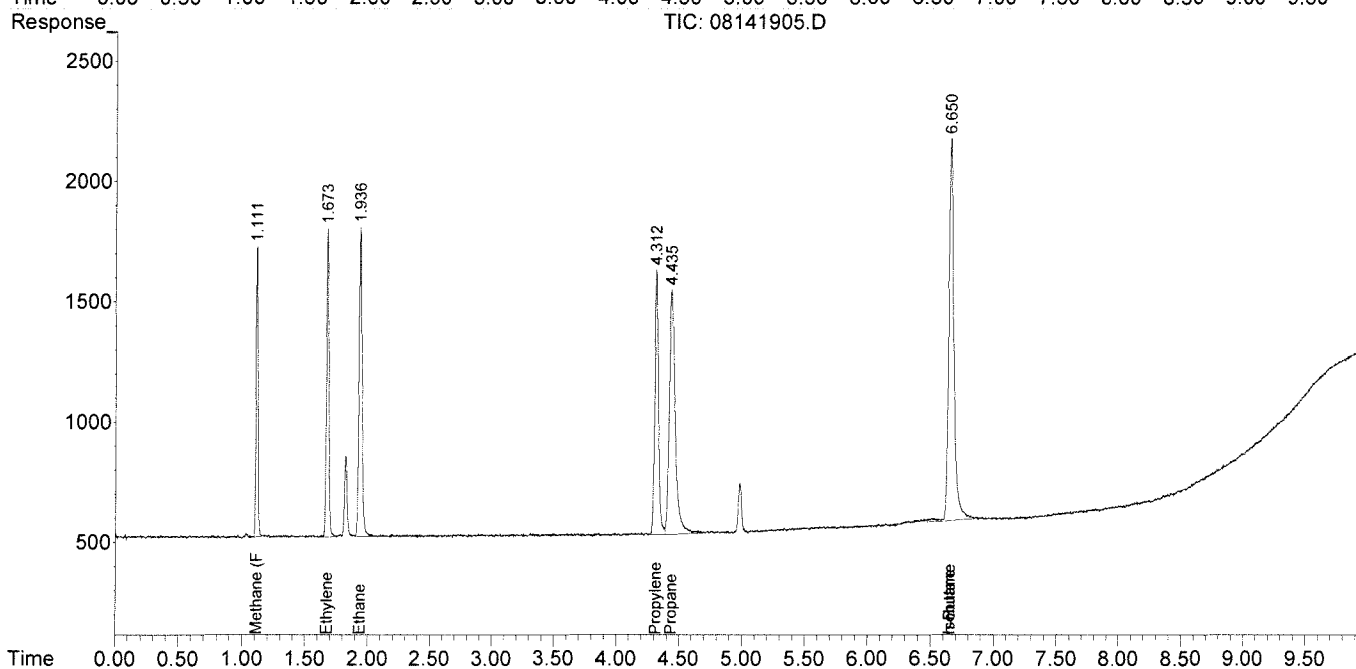
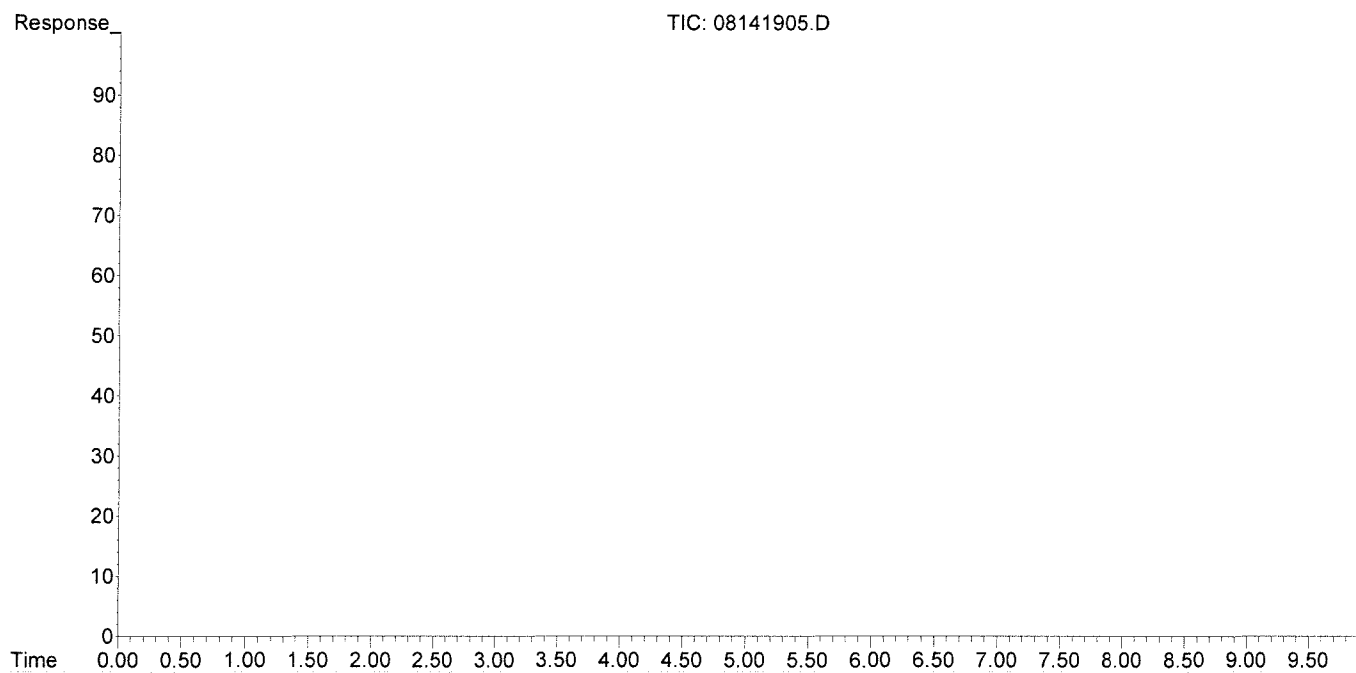
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2019_08\14\
Data File : 08141905.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 14-Aug-2019, 11:46:24
Operator : WH
Sample : FID LCSD 0.1ml
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 14 12:12:01 2019
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



Method Path : J:\GC10\METHODS\
 Method File : RS091217_R.M
 Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 Last Update : Wed Sep 13 11:14:47 2017
 Response Via : Initial Calibration

Calibration Files

1 =09121702.D 2 =09121703.D 3 =09121704.D
 4 =09121705.D 5 =09121706.D 6 =09121707.D

	Compound	1	2	3	4	5	6	Avg	%RSD
1)	Oxygen/Argon	3.739		1.014			0.001	0.793 E6	189.17
2)	Carbon monoxide	3.739		1.014			0.001	0.594 E6	221.92
3)	Methane (TCD)						2.161	0.951 E2	106.37
4)	Carbon dioxide	2.365	2.569	2.558	2.361	2.459	2.314	2.438 E2	4.44

Signal #2 Calibration Files

1 =09121702.D 2 =09121703.D 3 =09121704.D
 4 =09121705.D 5 =09121706.D 6 =09121707.D

	Compound	1	2	3	4	5	6	Avg	%RSD
6)	Methane (FID)		1.180	0.975	0.908	0.870	0.868	0.907 E4	11.66
7)	Ethylene	1.736	1.638	1.780	1.720	1.628	1.670	1.673 E4	3.90
8)	Ethane	1.781	1.676	1.784	1.730	1.692	1.675	1.695 E4	3.83
9)	Propylene	2.505	2.296	2.592	2.480	2.346	2.252	2.343 E4	6.56
10)	Propane	2.439	2.283	2.645	2.555	2.433	2.522	2.488 E4	4.20
11)	Isobutylene							0.652 E1	138.46
12)	Isobutane	6.058	4.793	2.214	1.553	1.353		2.662 E4	86.17
13)	n-Butane	6.058	4.793	2.214	1.553	1.353		2.662 E4	86.17

(#) = Out of Range ### Number of calibration levels exceeded format ###

RS091217_R.M Wed Sep 13 15:11:48 2017

Edit Compounds -- Compound #6 -- Methane (FID)

Search by: Ret Time Name Index

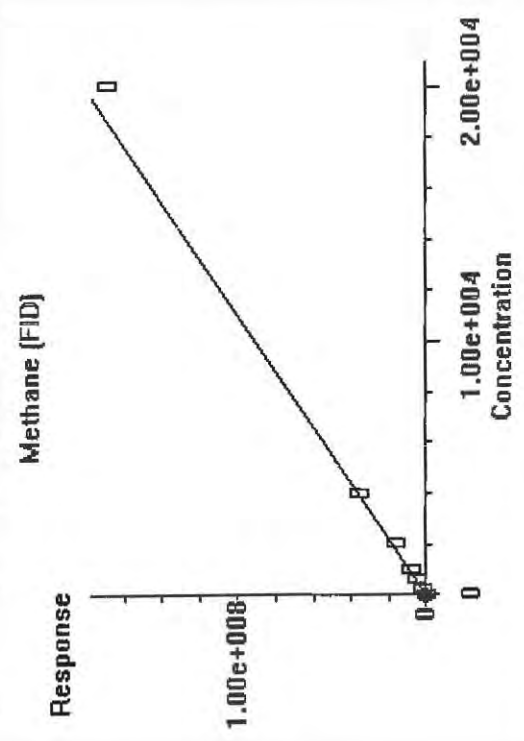
Compound Database	External Standard Compound	Lvl ID	Concentration	Response	Lvl ID	Concentration	Response
<input type="checkbox"/>	Oxygen/Argon	1	0.151000		11	20000.000000	1690009160.49199
<input type="checkbox"/>	Carbon monoxide	2	0.302000	3564.400000			
<input type="checkbox"/>	Methane (TCD)	3	1.510000	14725.288625			
<input type="checkbox"/>	Carbon dioxide	4	4.530000	41128.575000			
<input type="checkbox"/>	Signal #2	5	10.570000	91966.784531			
<input type="checkbox"/>	Methane (FID)	6	200.000000	1735997.497500			
<input type="checkbox"/>	Ethylene	7	600.000000	5189848.900000			
<input type="checkbox"/>	Propylene	8	1000.000000	8598533.570000			
<input type="checkbox"/>	Propane	9	2000.000000	16098208.390000			
<input type="checkbox"/>	Isobutylene	10	4000.000000	35776839.311352			
<input type="checkbox"/>	Isobutane						
<input type="checkbox"/>	n-Butane						

Identification Calibration User-Defined Advanced Reporting

Compound Database External Standard Compound

- Oxygen/Argon
- Carbon monoxide
- Methane (TCD)
- Carbon dioxide
- Signal #2
- Methane (FID)**
- Ethylene
- Propylene
- Propane
- Isobutylene
- Isobutane
- n-Butane

0.000e+000	Quadratic term
9.071e+003	Linear term
0.000e+000	Constant term
11.657%	RF Rel Std Dev



OK

Cancel

Help

Print Calibration Curve

Copy Calibration Curve

Search by: Ret Time

Compound Database
External Standard Compound

- Oxygen/Argon
- Carbon monoxide
- Methane (TCD)
- Carbon dioxide
- Signal #2
- Methane (FID)
- Ethylene
- Ethane
- Propylene
- Propane
- Isobutylene
- Isobutane
- n-Butane

Name

Calibration | User-Defined | Advanced | Reporting

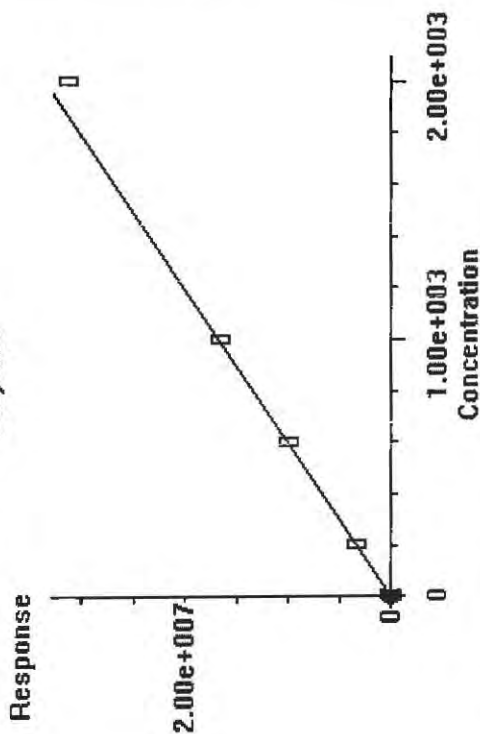
Index

Find Compound

Lvl ID	Concentration	Response
1	0.151000	2621.970000
2	0.302000	4946.731301
3	1.510000	26884.746847
4	4.530000	77902.721497
5	10.570000	172085.529560
6	200.000000	3339702.313219
7	600.000000	10007758.776971
8	1000.000000	16608503.805988
9	2000.000000	31192443.898600
10	4000.000000	

Lvl ID	Concentration	Response
11	20000.000000	

Ethylene



0.000e+000 Quadratic term
 1.673e+004 Linear term
 0.000e+000 Constant term
 3.897% RF Rel Std Dev

OK

Cancel

Help

Print Calibration Curve

Copy Calibration Curve

Edit Compounds: -- Compound #8 -- Ethane

Search by Rel Time

Name

Index

Identification Calibration User-Defined Advanced Reporting

Find Compound

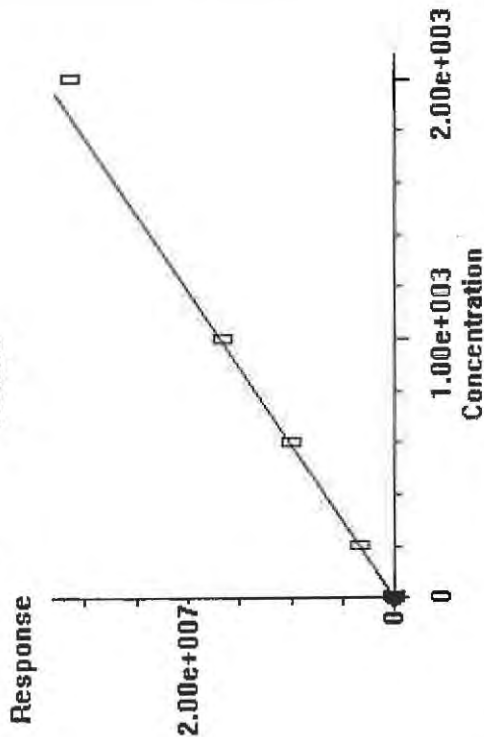
Compound Database
External Standard Compound

- Oxygen/Argon
- Carbon monoxide
- Methane (TCD)
- Carbon dioxide
- Signal #2
- Methane (FID)
- Ethane
- Propylene
- Propane
- Isobutylene
- Isobutane
- n-Butane

Lvl ID	Concentration	Response
1	0.151000	2689.928008
2	0.302000	5060.331943
3	1.510000	26943.657500
4	4.530000	79353.525045
5	10.570000	178840.731148
6	200.000000	3350442.319129
7	600.000000	10048964.218029
8	1000.000000	16709164.879012
9	2000.000000	31424217.938900
10	4000.000000	

Lvl ID	Concentration	Response
11	20000.000000	

Ethane



0.000e+000	Quadratic term
1.695e+004	Linear term
0.000e+000	Constant term
3.831%	RF Rel Std Dev

OK

Cancel

Help

Print Calibration Curve

Copy Calibration Curve

Search by Ret Time

Name

Index

Find Compound

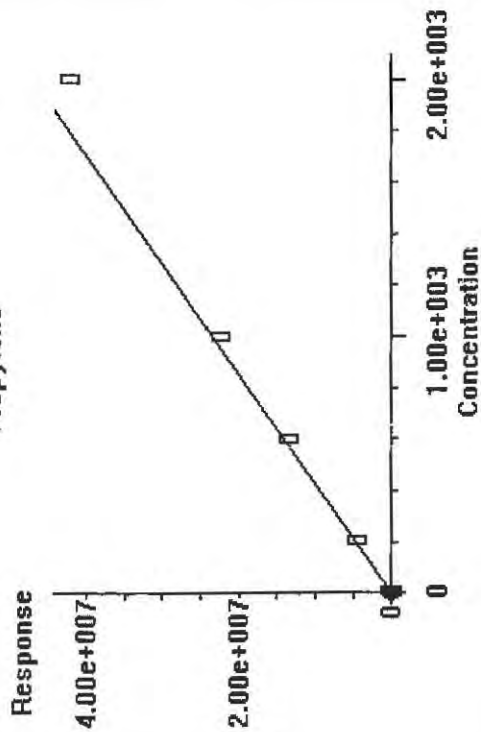
Compound Database
External Standard Compound

Identification Calibration User-Defined Advanced Reporting

- Oxygen/Argon
- Carbon monoxide
- Methane (TCD)
- Carbon dioxide
- Signal #2
- Methane (FID)
- Ethylene
- Ethane
- Propylene
- Propane
- Isobutylene
- Isobutane
- n-Butane

Lvl ID	Concentration	Response	Lvl ID	Concentration	Response
1	0.151000	3782.537646	11	20000.000000	
2	0.302000	6933.285530			
3	1.510000	39139.518208			
4	4.530000	112341.896872			
5	10.570000	248003.903623			
6	200.000000	4504060.086084			
7	600.000000	13569342.761419			
8	1000.000000	22494887.720990			
9	2000.000000	42124689.656800			
10	4000.000000				

Propylene



0.000e+000	Quadratic term
2.343e+004	Linear term
0.000e+000	Constant term
6.559%	RF Rel Std Dev

OK

Cancel

Help

Print Calibration Curve

Copy Calibration Curve

Search by Ret Time

Compound Database
External Standard Compound

- Oxygen/Argon
- Carbon monoxide
- Methane (TCD)
- Carbon dioxide
- Signal #2
- Methane (FID)
- Ethylene
- Ethane
- Propylene
- Propane
- Isobutylene
- Isobutane
- n-Butane

Name

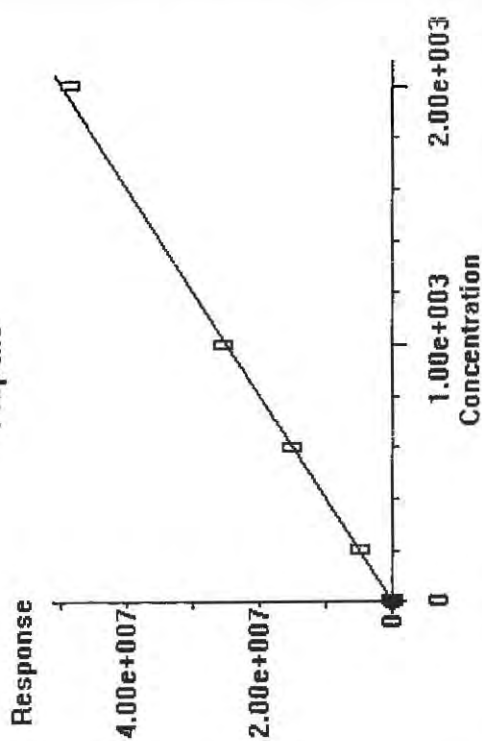
Calibration | User-Defined | Advanced | Reporting

Index

Find Compound

Lvl ID	Concentration	Response	Lvl ID	Concentration	Response
1	0.151000	3682.897354	11	20000.000000	
2	0.302000	6894.237803			
3	1.510000	39934.166792			
4	4.530000	115723.428128			
5	10.570000	257124.432806			
6	200.000000	5043035.663316			
7	600.000000	15251325.797404			
8	1000.000000	25459410.657938			
9	2000.000000	48583085.287451			
10	4000.000000				

Propane



0.000e+000	Quadratic term
2.488e+004	Linear term
0.000e+000	Constant term
4.200%	RF Rel Std Dev

OK

Cancel

Help

Print Calibration Curve

Copy Calibration Curve

Method Path : J:\GC10\METHODS\
 Method File : RS091217_R.M
 Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 Last Update : Wed Sep 13 11:14:47 2017
 Response Via : Initial Calibration

#	ID	Conc	ISTD Conc	Path\File
1	1	0	0	J:\GC10\DATA\RSK_FID\2017_09\12\09121702.D
2	2	0	0	J:\GC10\DATA\RSK_FID\2017_09\12\09121703.D
3	3	3	0	J:\GC10\DATA\RSK_FID\2017_09\12\09121704.D
4	4	10	0	J:\GC10\DATA\RSK_FID\2017_09\12\09121705.D
5	5	25	0	J:\GC10\DATA\RSK_FID\2017_09\12\09121706.D
6	6	125	0	J:\GC10\DATA\RSK_FID\2017_09\12\09121707.D
7	7	5000	0	J:\GC10\DATA\RSK_FID\2017_09\12\09121708.D
8	8	25000	0	J:\GC10\DATA\RSK_FID\2017_09\12\09121709.D
9	9	2000	0	J:\GC10\DATA\RSK_FID\2017_09\12\09121710.D
10	10	30000	0	J:\GC10\DATA\RSK_FID\2017_09\12\09121711.D
11	11	20000	0	J:\GC10\DATA\RSK_FID\2017_09\12\09121712.D

#	ID	Update Time	Quant Time	Acquisition Time
1	1	Sep 13 11:04 2017	Sep 12 15:03 2017	12-Sep-2017, 10:52
2	2	Sep 13 11:05 2017	Sep 13 11:05 2017	12-Sep-2017, 11:05
3	3	Sep 13 11:06 2017	Sep 13 11:05 2017	12-Sep-2017, 11:45
4	4	Sep 13 11:09 2017	Sep 13 11:06 2017	12-Sep-2017, 12:09
5	5	Sep 13 11:09 2017	Sep 13 11:09 2017	12-Sep-2017, 12:30
6	6	Sep 13 11:10 2017	Sep 13 11:10 2017	12-Sep-2017, 12:47
7	7	Sep 13 11:11 2017	Sep 13 11:10 2017	12-Sep-2017, 13:00
8	8	Sep 13 11:12 2017	Sep 13 11:11 2017	12-Sep-2017, 13:47
9	9	Sep 13 11:12 2017	Sep 13 11:12 2017	12-Sep-2017, 14:07
10	10	Sep 13 11:14 2017	Sep 13 11:13 2017	12-Sep-2017, 14:48
11	11	Sep 13 11:14 2017	Sep 13 11:14 2017	12-Sep-2017, 15:21

RS091217_R.M Wed Sep 13 15:11:22 2017

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
 Data File : 09121702.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 12-Sep-2017, 10:52
 Operator : MC
 Sample : 0.151ppm 0.250ml s32-09121702
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Sep 12 11:03:15 2017
 Quant Method : I:\GC10\METHODS\RS082417.M
 Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 QLast Update : Fri Aug 25 09:19:14 2017
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :

Compound	R.T.	Response	Conc	Units

Target Compounds				
1) Oxygen/Argon	1.767	373920	0.128	ppm
2) Carbon monoxide	1.767	373920	N.D.	ppm
3) Methane (TCD)	0.000	0	N.D.	ppm
4) Carbon dioxide	0.000	0	N.D.	ppm
6) Methane (FID)	0.000	0	N.D.	ppm d
7) Ethylene	1.595	2622	0.156	ppm
8) Ethane	1.848	2690	0.156	ppm
9) Propylene	4.222	3783	0.154	ppm
10) Propane	4.348	3683	0.139	ppm
11) Isobutylene	0.000	0	N.D.	ppm
12) Isobutane	6.582f	6058	NoCal	ppm
13) n-Butane	6.582f	6058	NoCal	ppm

(f)=RT Delta > 1/2 Window

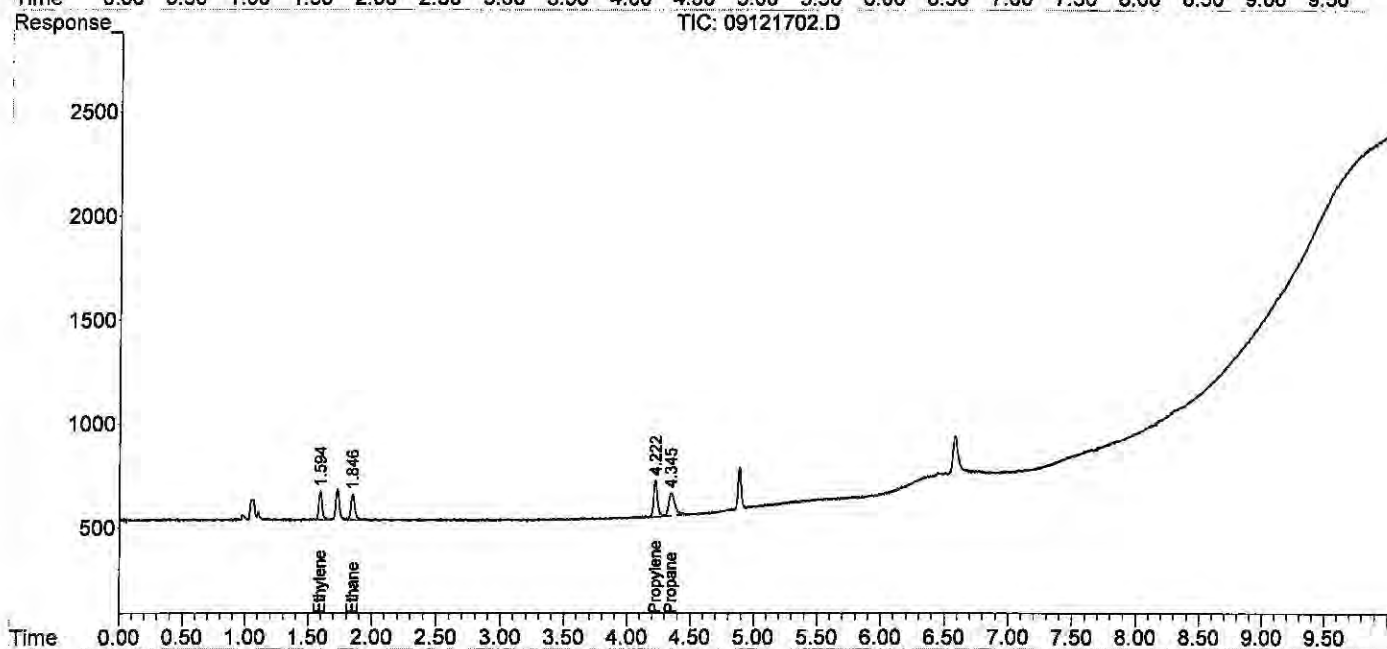
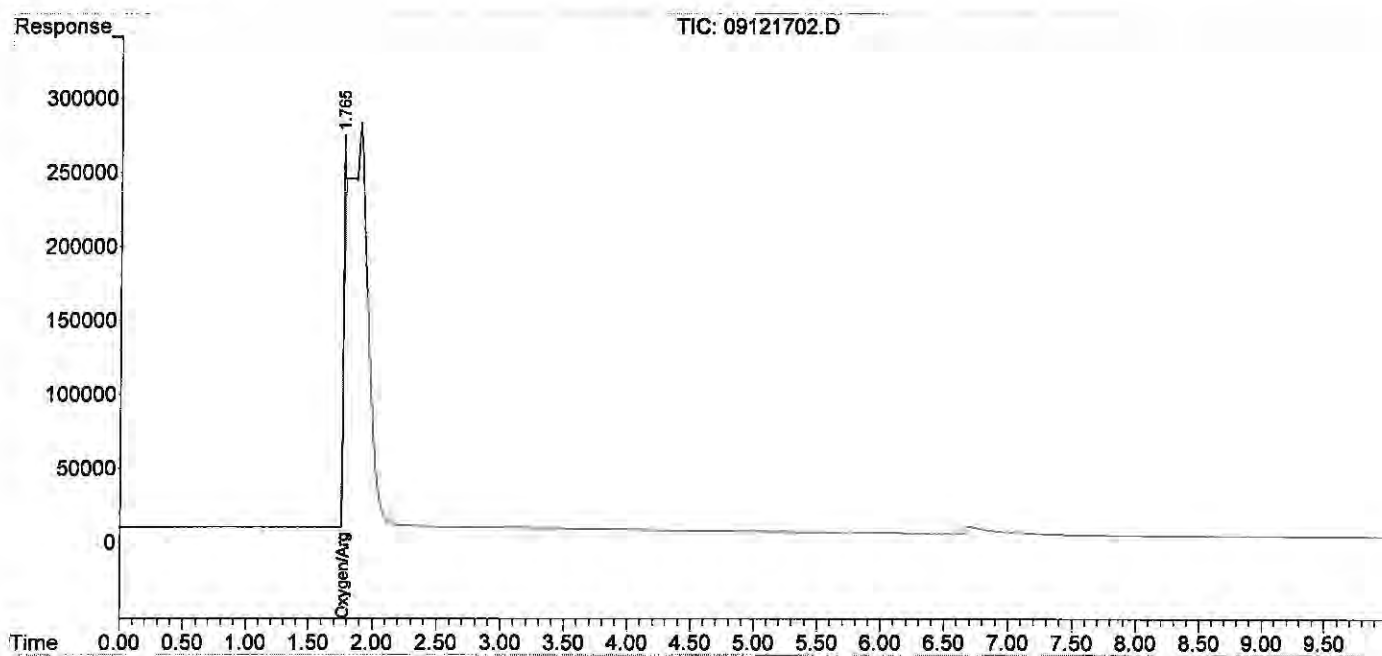
(m)=manual int.

MC 9/13/17

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
 Data File : 09121702.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 12-Sep-2017, 10:52
 Operator : MC
 Sample : 0.151ppm 0.250ml s32-09121702
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Sep 12 11:03:15 2017
 Quant Method : I:\GC10\METHODS\RS082417.M
 Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 QLast Update : Fri Aug 25 09:19:14 2017
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :



Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
 Data File : 09121703.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 12-Sep-2017, 11:05
 Operator : MC
 Sample : 0.302ppm 0.5ml s32-09121702
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Sep 13 11:05:03 2017
 Quant Method : J:\GC10\METHODS\RS091217_R.M
 Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 QLast Update : Wed Sep 13 11:04:50 2017
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :

Compound	R.T.	Response	Conc	Units

Target Compounds				
1) Oxygen/Argon	1.913f	-25181981	N.D.	ppm
2) Carbon monoxide	1.913f	-25181981	1.089	ppm
3) Methane (TCD)	0.000	0	N.D.	ppm
4) Carbon dioxide	0.000	0	N.D.	ppm
6) Methane (FID)	1.049	3564	0.391	ppm m
7) Ethylene	1.577	4947	0.292	ppm
8) Ethane	1.828	5060	0.293	ppm
9) Propylene	4.207	6933	0.281	ppm
10) Propane	4.337	6894	0.268	ppm
11) Isobutylene	0.000	0	N.D.	ppm
12) Isobutane	6.579f	9587	0.158	ppm
13) n-Butane	6.579f	9587	0.158	ppm

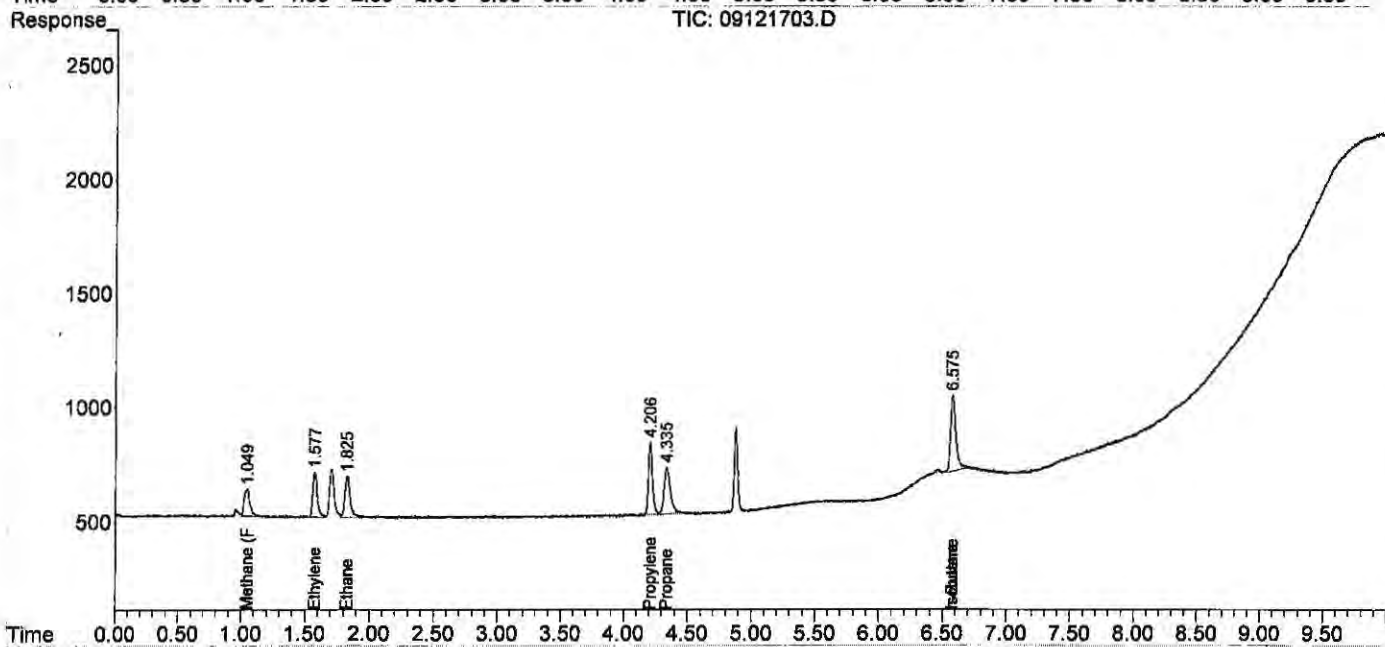
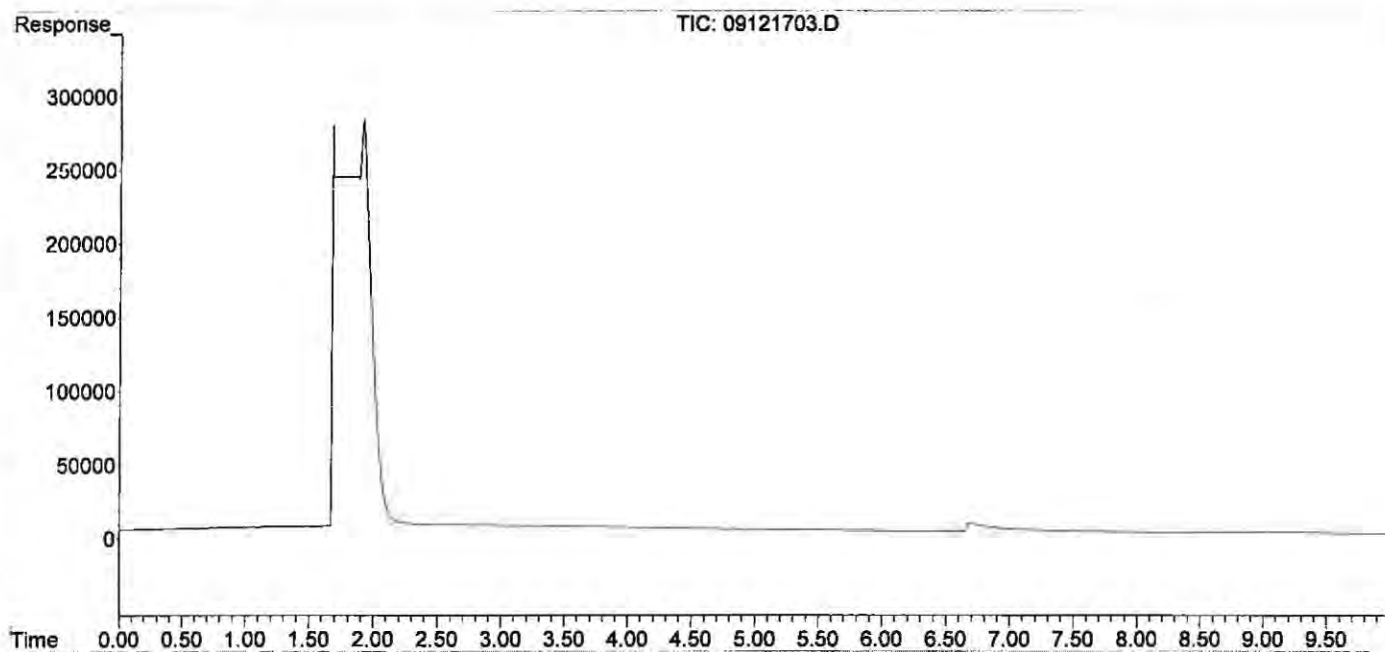
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
 Data File : 09121703.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 12-Sep-2017, 11:05
 Operator : MC
 Sample : 0.302ppm 0.5ml s32-09121702
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Sep 13 11:05:03 2017
 Quant Method : J:\GC10\METHODS\RS091217_R.M
 Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 QLast Update : Wed Sep 13 11:04:50 2017
 Response via : Initial Calibration
 Integrator: ChemStation

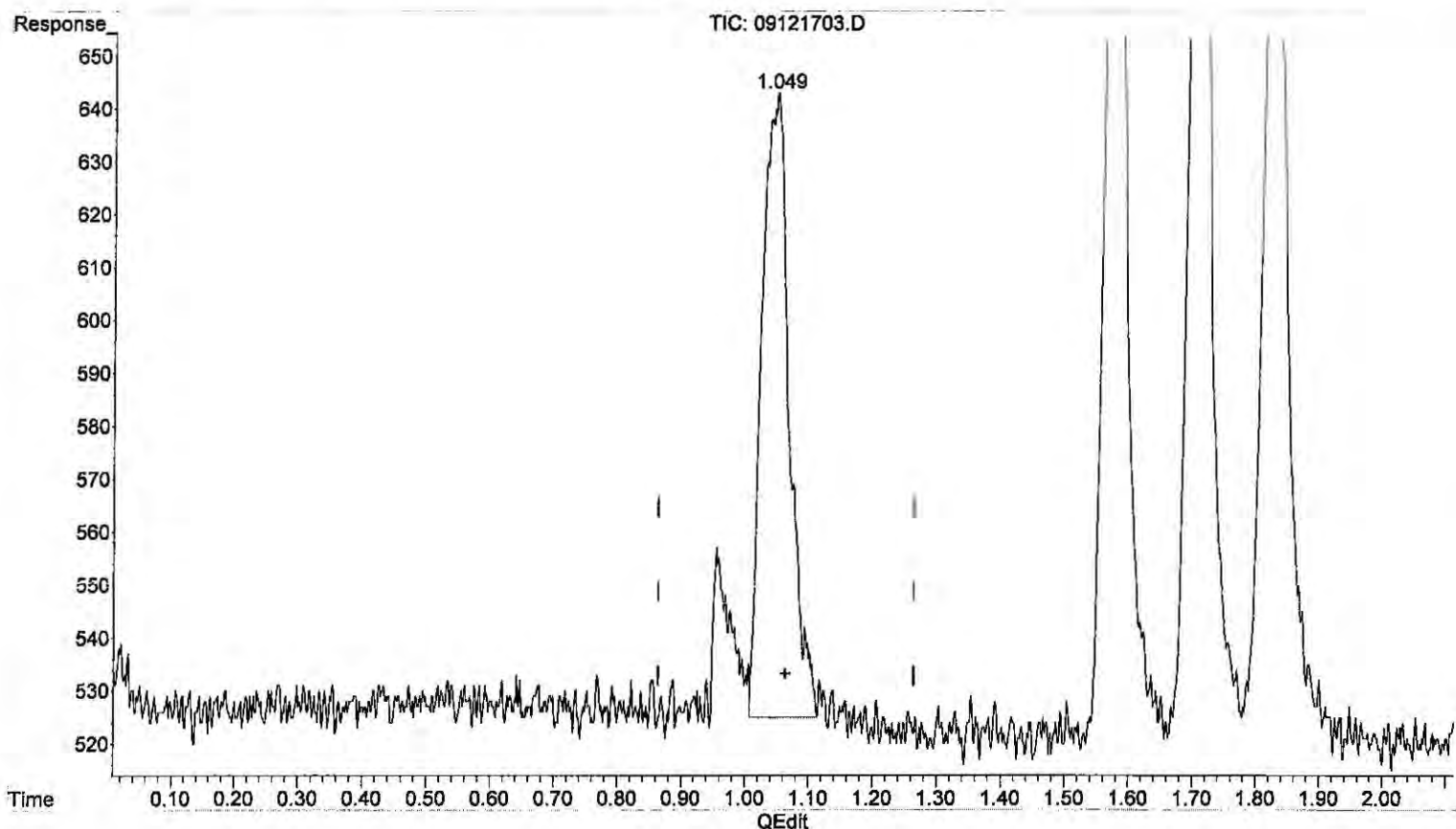
Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :



Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
 Data File : 09121703.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 12-Sep-2017, 11:05
 Operator : MC
 Sample : 0.302ppm 0.5ml s32-09121702
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Sep 13 11:05:03 2017
 Quant Method : J:\GC10\METHODS\RS091217_R.M
 Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 QLast Update : Wed Sep 13 11:04:50 2017
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :



(6) Methane (FID)
 1.049min 0.391 ppm m
 response 3564

Handwritten notes:
 Me 9/13/17
 Bu
 No
 present
 Wg/2/17

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
 Data File : 09121704.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 12-Sep-2017, 11:45
 Operator : MC
 Sample : 1.51ppm 0.1ml s32-09051701
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Sep 13 11:05:55 2017
 Quant Method : J:\GC10\METHODS\RS091217_R.M
 Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 QLast Update : Wed Sep 13 11:04:50 2017
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Oxygen/Argon	1.847	2536230	1.056 ppm
2) Carbon monoxide	1.847	2536230	N.D. ppm
3) Methane (TCD)	0.000	0	N.D. ppm
4) Carbon dioxide	0.000	0	N.D. ppm
6) Methane (FID)	1.064	14725	1.613 ppm
7) Ethylene	1.598	26885	1.582 ppm
8) Ethane	1.851	26944	1.555 ppm
9) Propylene	4.220	39140	1.589 ppm
10) Propane	4.349	39934	1.596 ppm
11) Isobutylene	0.000	0	N.D. ppm
12) Isobutane	6.578f	55348	1.020 ppm
13) n-Butane	6.578f	55348	1.020 ppm

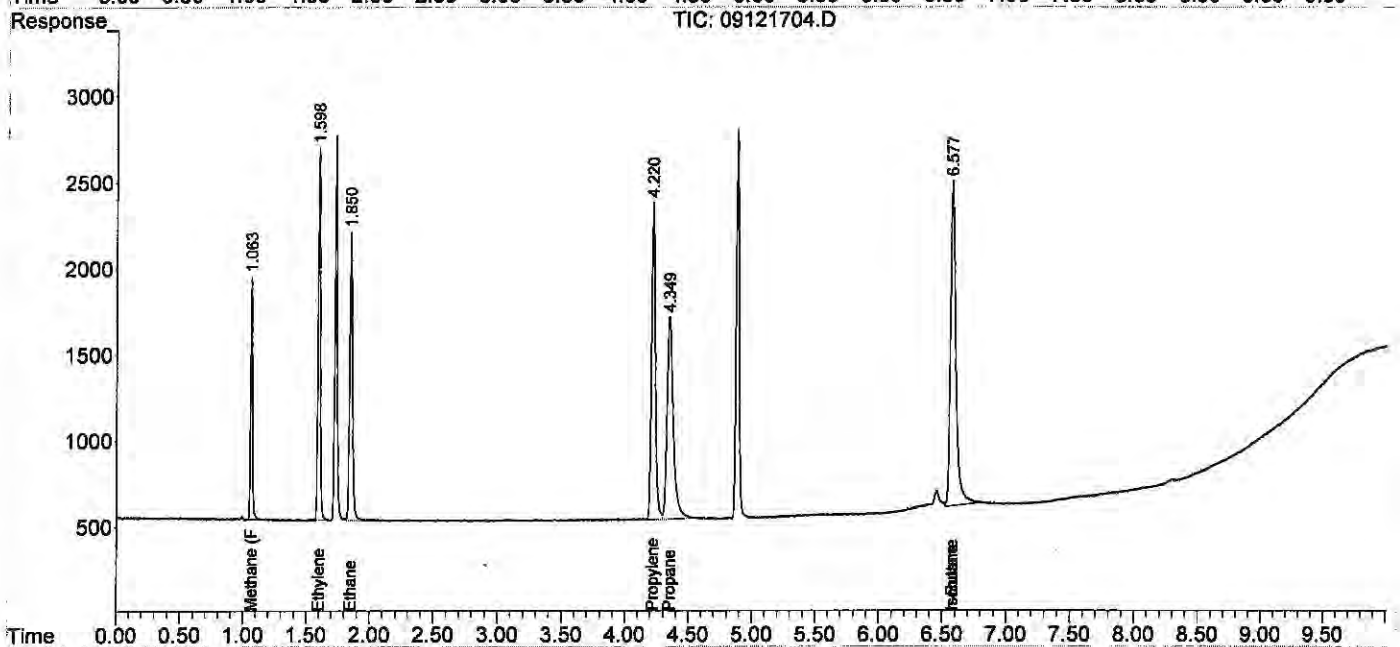
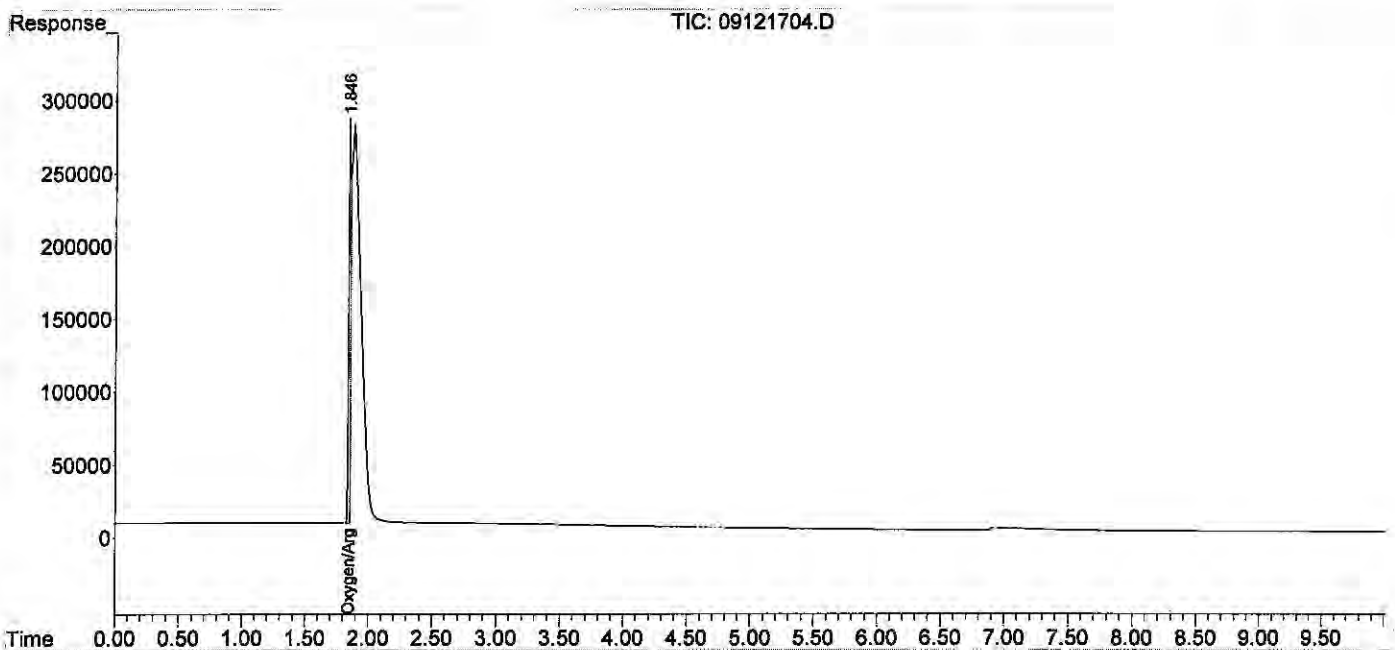
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
 Data File : 09121704.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 12-Sep-2017, 11:45
 Operator : MC
 Sample : 1.51ppm 0.1ml s32-09051701
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Sep 13 11:05:55 2017
 Quant Method : J:\GC10\METHODS\RS091217_R.M
 Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 QLast Update : Wed Sep 13 11:04:50 2017
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :



Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
 Data File : 09121705.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 12-Sep-2017, 12:09
 Operator : MC
 Sample : 4.53ppm 0.3ml s32-09051701
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Sep 13 11:06:32 2017
 Quant Method : J:\GC10\METHODS\RS091217_R.M
 Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 QLast Update : Wed Sep 13 11:04:50 2017
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :

Compound	R.T.	Response	Conc	Units

Target Compounds				
1) Oxygen/Argon	1.738	-331216	N.D.	ppm
2) Carbon monoxide	1.738	-331216	0.019	ppm
3) Methane (TCD)	0.000	0	N.D.	ppm
4) Carbon dioxide	0.000	0	N.D.	ppm
6) Methane (FID)	1.052	41129	4.522	ppm
7) Ethylene	1.586	77903	4.637	ppm
8) Ethane	1.838	78354	4.558	ppm
9) Propylene	4.218	112342	4.614	ppm
10) Propane	4.347	115723	4.680	ppm
11) Isobutylene	0.000	0	N.D.	ppm
12) Isobutane	6.580f	155256	3.565	ppm
13) n-Butane	6.580f	155256	3.565	ppm

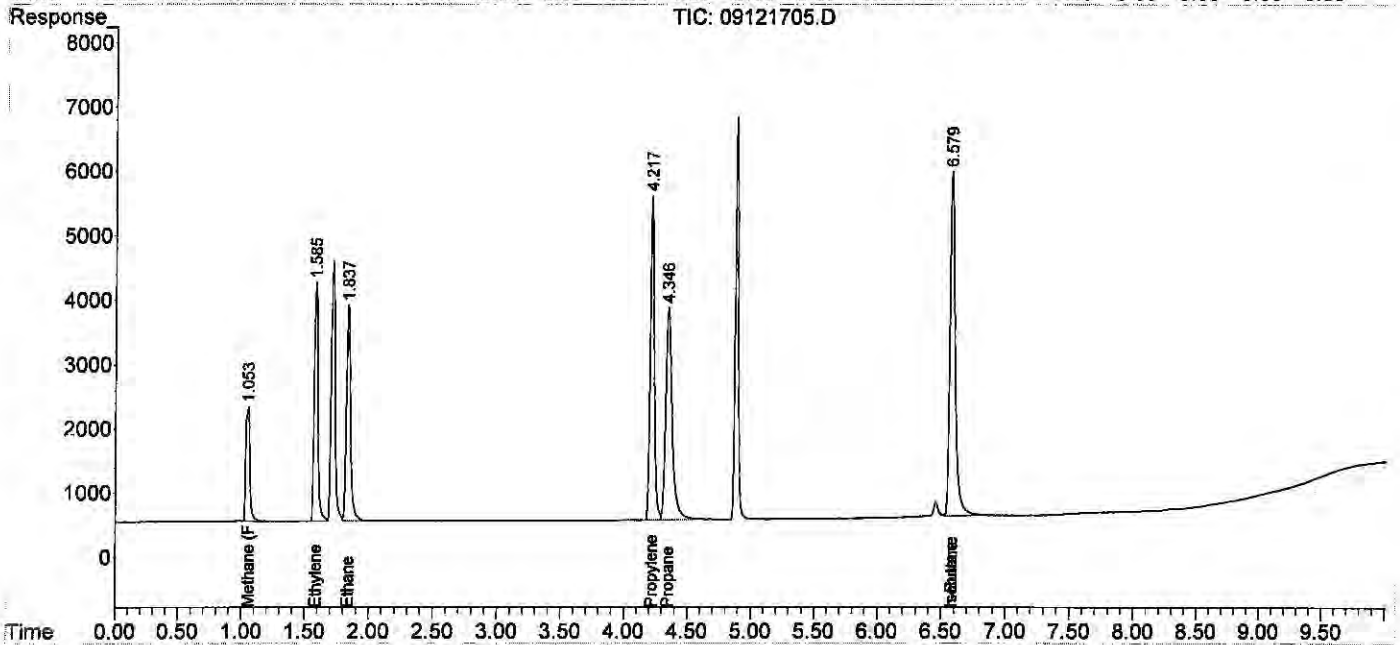
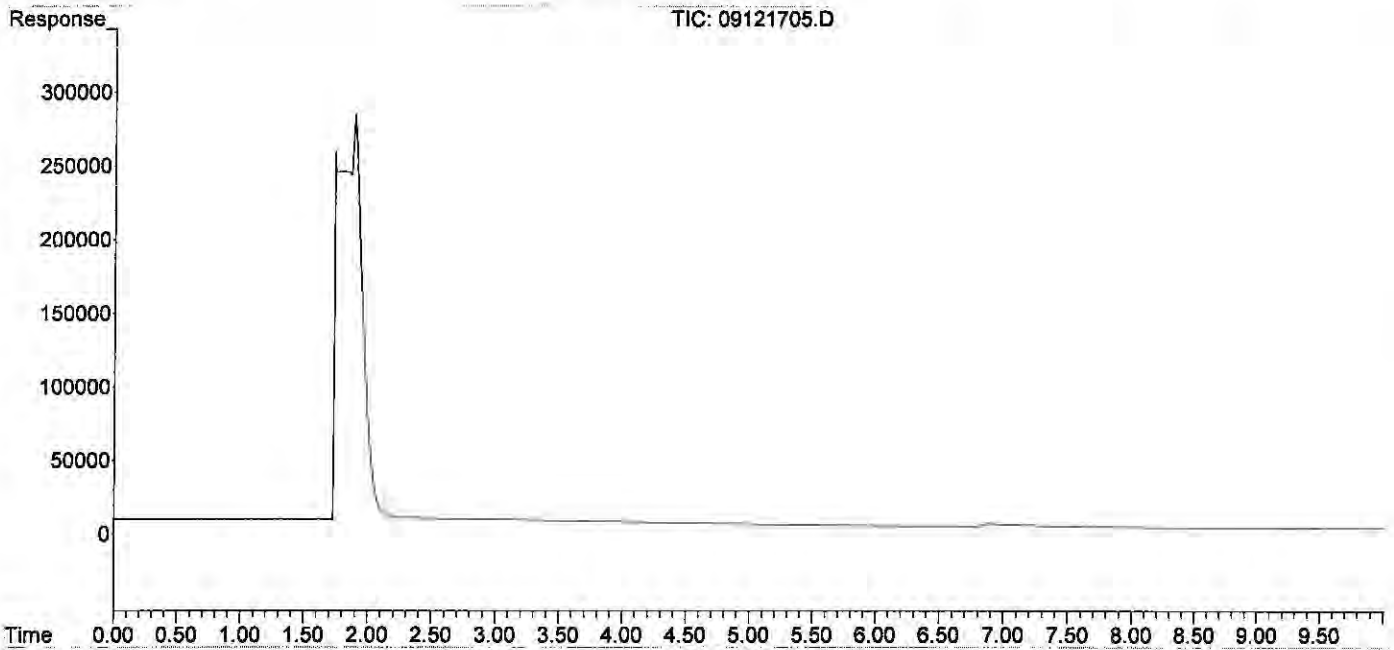
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
 Data File : 09121705.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 12-Sep-2017, 12:09
 Operator : MC
 Sample : 4.53ppm 0.3ml s32-09051701
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Sep 13 11:06:32 2017
 Quant Method : J:\GC10\METHODS\RS091217_R.M
 Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 QLast Update : Wed Sep 13 11:04:50 2017
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :



Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
 Data File : 09121706.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 12-Sep-2017, 12:30
 Operator : MC
 Sample : 10.57ppm 0.7ml s32-09051701
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Sep 13 11:09:24 2017
 Quant Method : J:\GC10\METHODS\RS091217_R.M
 Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 QLast Update : Wed Sep 13 11:04:50 2017
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :

Compound	R.T.	Response	Conc	Units

Target Compounds				
1) Oxygen/Argon	1.929f	-31871242	N.D.	ppm
2) Carbon monoxide	1.929f	-31871242	1.818	ppm
3) Methane (TCD)	0.000	0	N.D.	ppm
4) Carbon dioxide	0.000	0	N.D.	ppm
6) Methane (FID)	1.025	91967	10.135	ppm
7) Ethylene	1.568	172086	10.273	ppm
8) Ethane	1.822	178841	10.441	ppm
9) Propylene	4.214	248004	10.236	ppm
10) Propane	4.344	257124	10.458	ppm
11) Isobutylene	0.000	0	N.D.	ppm
12) Isobutane	6.578f	338181	9.254	ppm
13) n-Butane	6.578f	338181	9.254	ppm

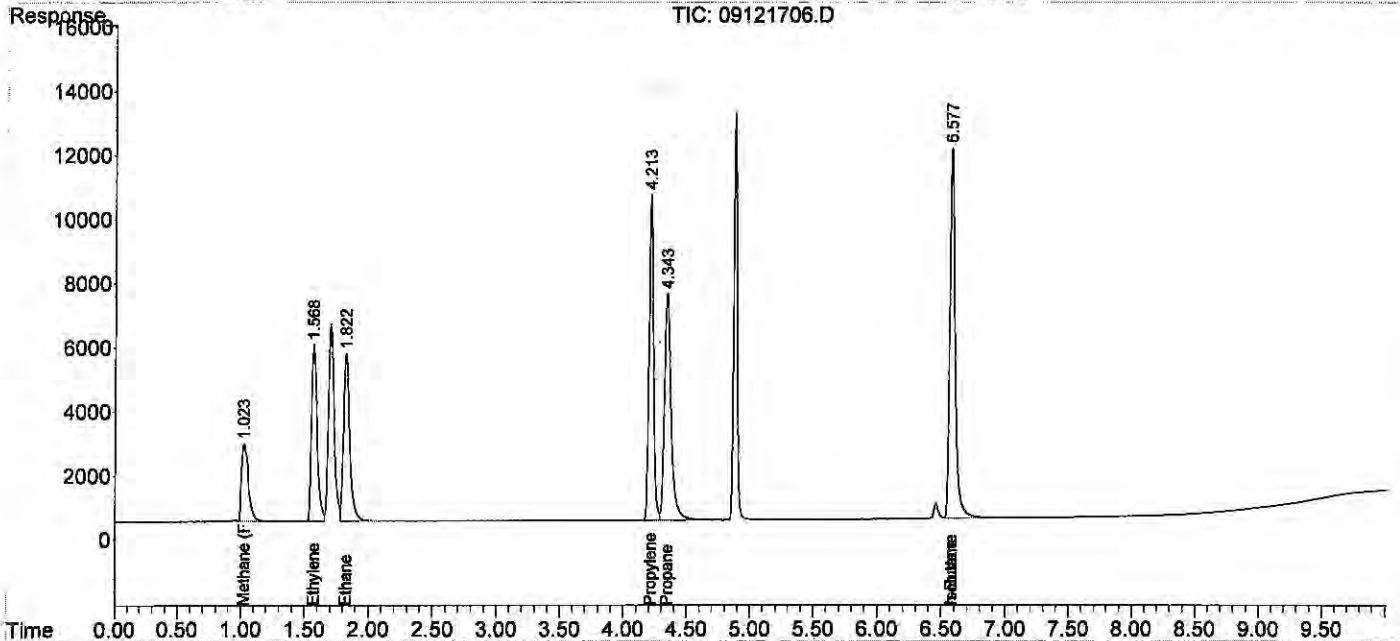
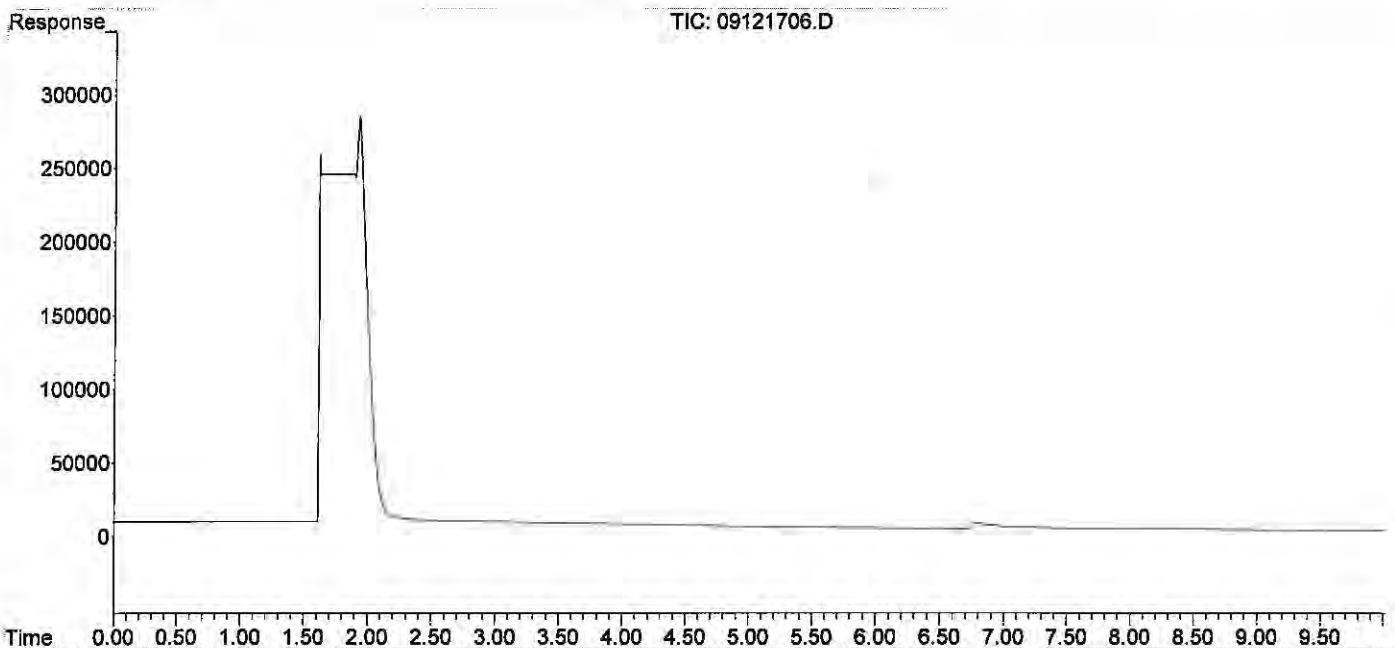
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
 Data File : 09121706.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 12-Sep-2017, 12:30
 Operator : MC
 Sample : 10.57ppm 0.7ml s32-09051701
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Sep 13 11:09:24 2017
 Quant Method : J:\GC10\METHODS\RS091217_R.M
 Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 QLast Update : Wed Sep 13 11:04:50 2017
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :



Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
 Data File : 09121707.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 12-Sep-2017, 12:47
 Operator : MC
 Sample : 200ppm 0.1ml s32-09121701
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Sep 13 11:09:59 2017
 Quant Method : J:\GC10\METHODS\RS091217 R.M
 Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 QLast Update : Wed Sep 13 11:04:50 2017
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :

Compound	R.T.	Response	Conc	Units

Target Compounds				
1) Oxygen/Argon	1.897	155286	0.065	ppm
2) Carbon monoxide	1.897	155286	N.D.	ppm
3) Methane (TCD)	4.079f	27015	2856.472	ppm
4) Carbon dioxide	0.000	0	N.D.	ppm
6) Methane (FID)	1.063	1735997	190.792	ppm
7) Ethylene	1.597	3339702	198.758	ppm
8) Ethane	1.849	3350442	194.597	ppm
9) Propylene	4.201	4504060	185.706	ppm
10) Propane	4.333	5043036	204.809	ppm
11) Isobutylene	0.000	0	N.D.	ppm
12) Isobutane	0.000	0	N.D.	ppm
13) n-Butane	0.000	0	N.D.	ppm

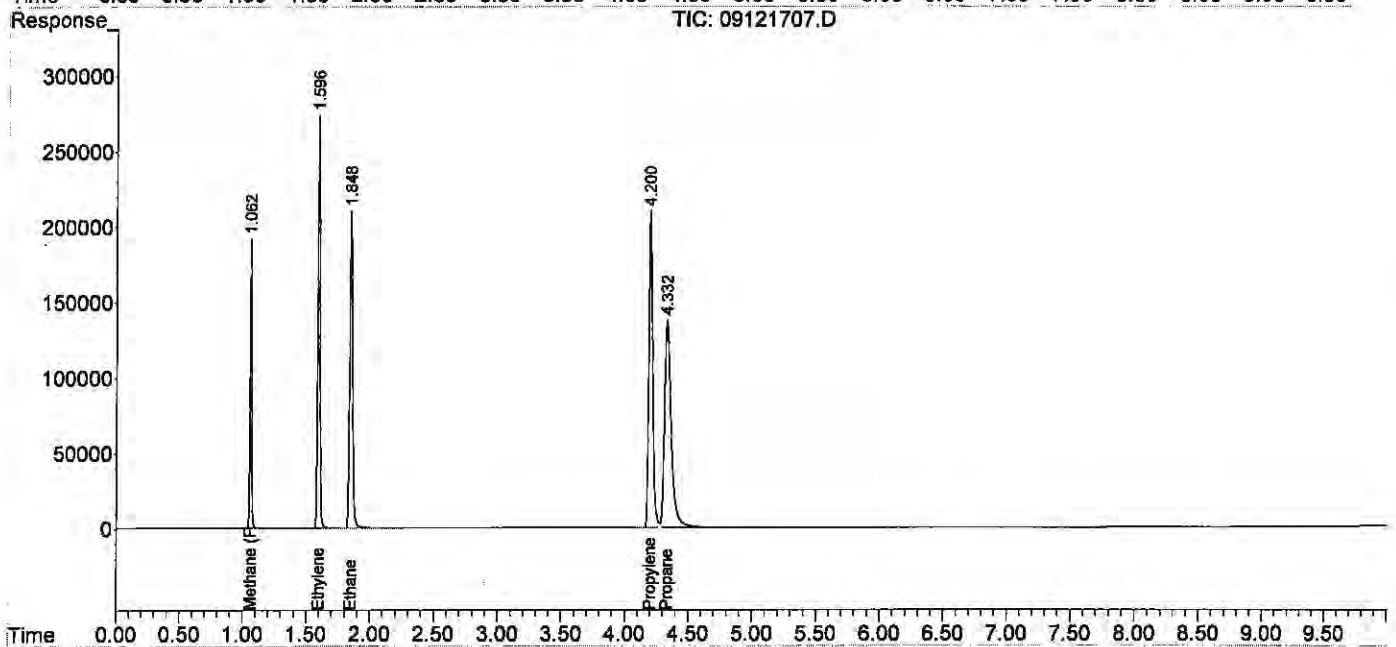
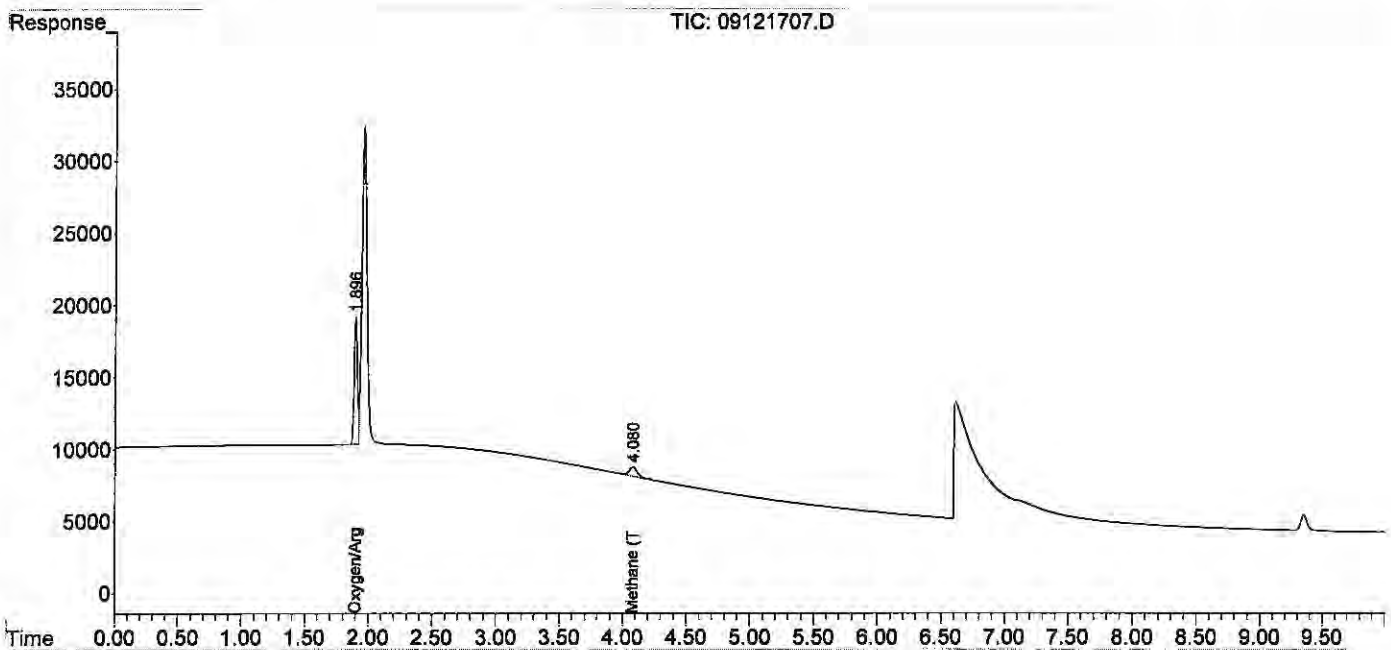
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
 Data File : 09121707.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 12-Sep-2017, 12:47
 Operator : MC
 Sample : 200ppm 0.1ml s32-09121701
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Sep 13 11:09:59 2017
 Quant Method : J:\GC10\METHODS\RS091217_R.M
 Quant Title : RSK175, VOA-DIGAS, VOA-TO3C1C6
 QLast Update : Wed Sep 13 11:04:50 2017
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :



Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
 Data File : 09121708.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 12-Sep-2017, 13:00
 Operator : MC
 Sample : 600ppm 0.3ml s32-09121701
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Sep 13 11:10:57 2017
 Quant Method : J:\GC10\METHODS\RS091217_R.M
 Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 QLast Update : Wed Sep 13 11:10:50 2017
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :

Compound	R.T.	Response	Conc	Units

Target Compounds				
1) Oxygen/Argon	1.884	196022	0.124	ppm
2) Carbon monoxide	1.884	196022	N.D.	ppm
3) Methane (TCD)	4.070f	88282	782.730	ppm
4) Carbon dioxide	0.000	0	N.D.	ppm
6) Methane (FID)	1.044	5189849	539.759	ppm
7) Ethylene	1.573	10007759	590.286	ppm
8) Ethane	1.822	10048964	583.213	ppm
9) Propylene	4.160	13569343	562.612	ppm
10) Propane	4.300	15251326	615.171	ppm
11) Isobutylene	6.143	9815	NoCal	ppm
12) Isobutane	0.000	0	N.D.	ppm
13) n-Butane	0.000	0	N.D.	ppm

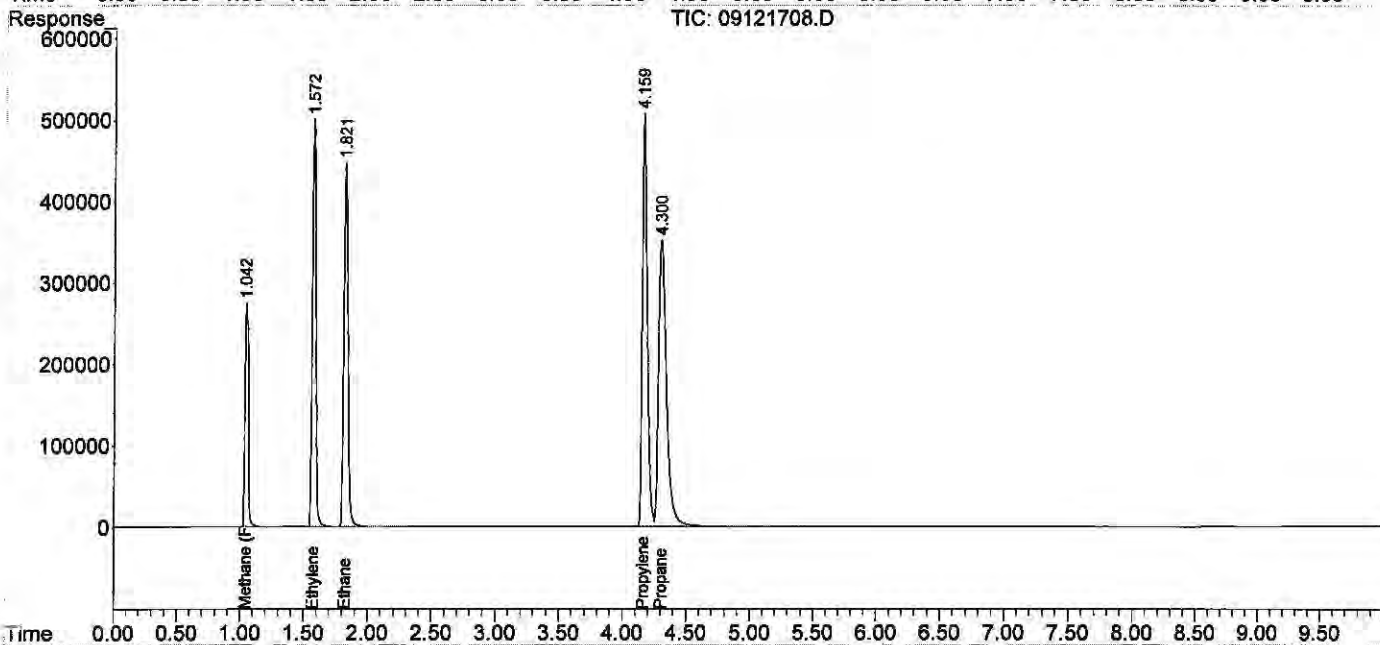
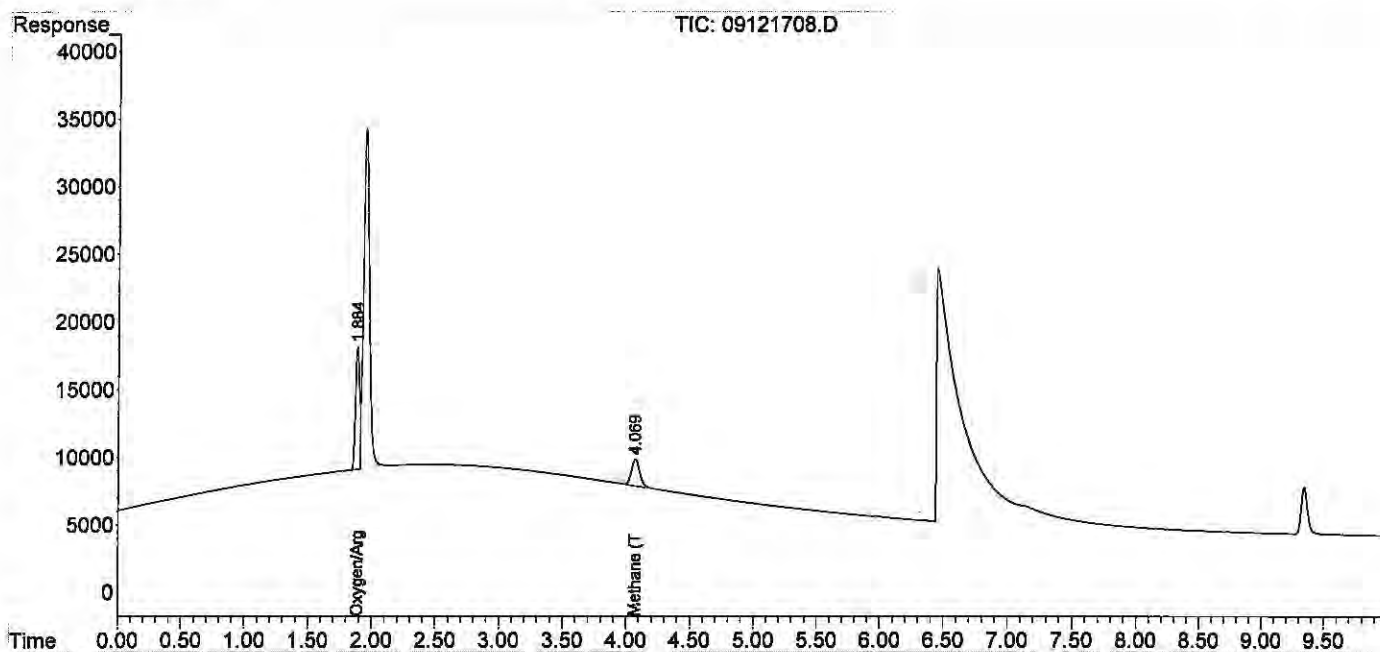
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
 Data File : 09121708.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 12-Sep-2017, 13:00
 Operator : MC
 Sample : 600ppm 0.3ml s32-09121701
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Sep 13 11:10:57 2017
 Quant Method : J:\GC10\METHODS\RS091217_R.M
 Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 QLast Update : Wed Sep 13 11:10:50 2017
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :



Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
 Data File : 09121709.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 12-Sep-2017, 13:47
 Operator : MC
 Sample : 1000ppm 0.5ml s32-09121701
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Sep 13 11:11:46 2017
 Quant Method : J:\GC10\METHODS\RS091217_R.M
 Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 QLast Update : Wed Sep 13 11:11:38 2017
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :

Compound	R.T.	Response	Conc	Units

Target Compounds				
1) Oxygen/Argon	1.879	192611	0.162	ppm
2) Carbon monoxide	1.879	192611	N.D.	ppm
3) Methane (TCD)	4.070f	145492	1244.729	ppm
4) Carbon dioxide	0.000	0	N.D.	ppm
6) Methane (FID)	1.039	8598534	945.644	ppm
7) Ethylene	1.576	16608504	981.887	ppm
8) Ethane	1.827	16709165	973.644	ppm
9) Propylene	4.161	22494888	941.060	ppm
10) Propane	4.298	25459411	1023.223	ppm
11) Isobutylene	6.138	16970	8645.243	ppm
12) Isobutane	0.000	0	N.D.	ppm
13) n-Butane	0.000	0	N.D.	ppm

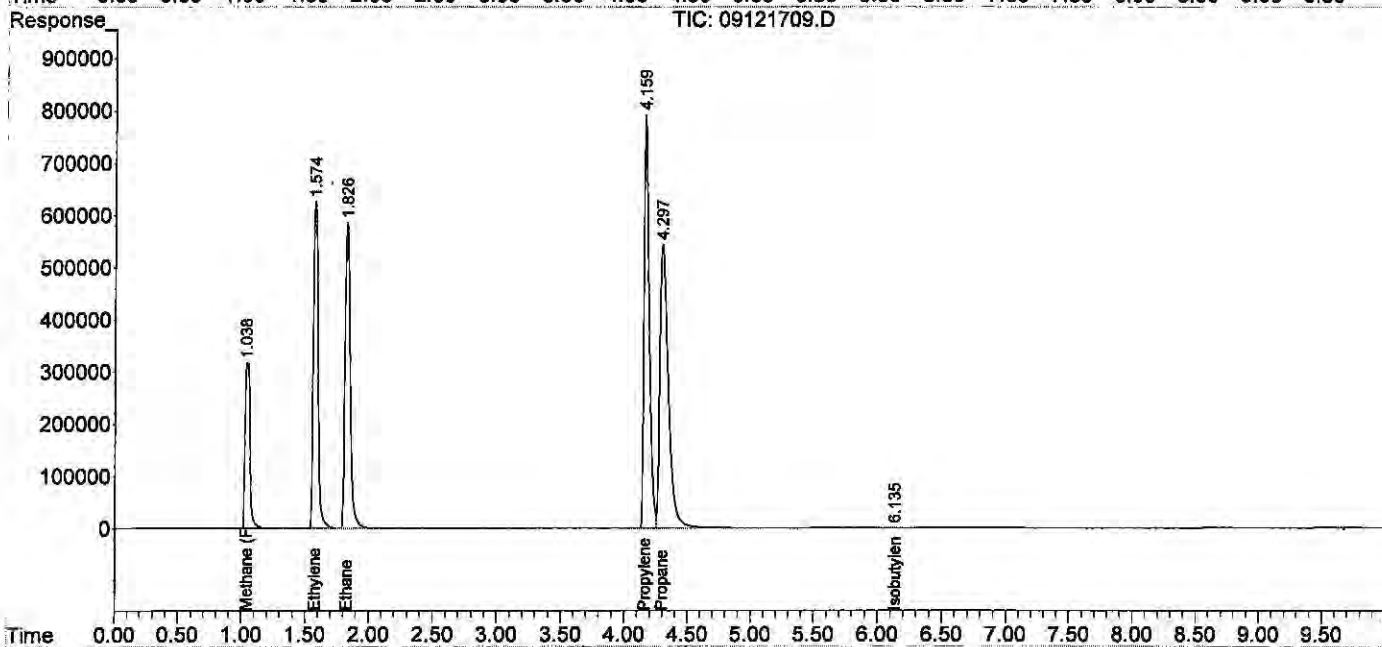
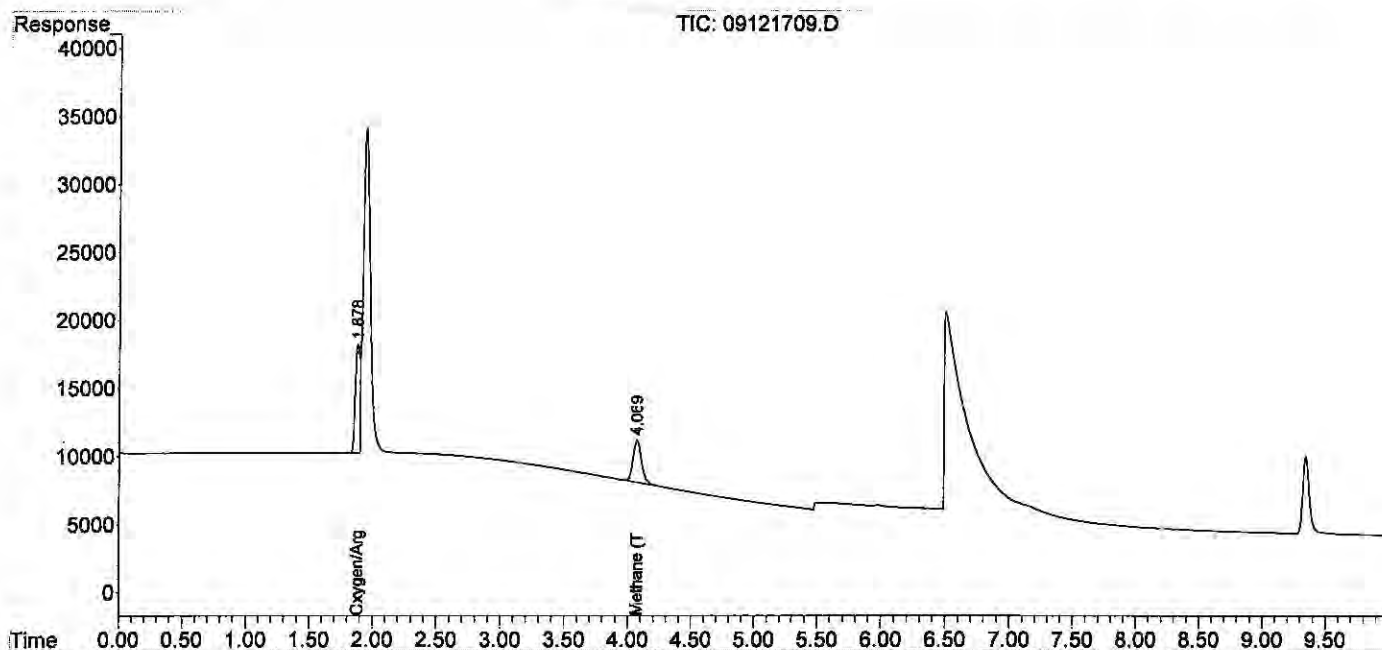
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
 Data File : 09121709.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 12-Sep-2017, 13:47
 Operator : MC
 Sample : 1000ppm 0.5ml s32-09121701
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Sep 13 11:11:46 2017
 Quant Method : J:\GC10\METHODS\RS091217_R.M
 Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 QLast Update : Wed Sep 13 11:11:38 2017
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :



Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
 Data File : 09121710.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 12-Sep-2017, 14:07
 Operator : MC
 Sample : 2000ppm 1ml s32-09121701
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Sep 13 11:12:33 2017
 Quant Method : J:\GC10\METHODS\RS091217_R.M
 Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 QLast Update : Wed Sep 13 11:12:25 2017
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :

Compound	R.T.	Response	Conc	Units
Target Compounds				
1) Oxygen/Argon	1.922f	1578147	1.659	ppm
2) Carbon monoxide	1.922f	1578147	N.D.	ppm
3) Methane (TCD)	4.057f	281651	3526.607	ppm
4) Carbon dioxide	0.000	0	N.D.	ppm
6) Methane (FID)	1.016	16098209	1763.622	ppm
7) Ethylene	1.552	31192444	1848.268	ppm
8) Ethane	1.801	31424218	1837.143	ppm
9) Propylene	4.129	42124690	1775.341	ppm m
10) Propane	4.269	48583085	1946.921	ppm
11) Isobutylene	6.136	33832	25613.603	ppm
12) Isobutane	6.576f	3845	0.120	ppm
13) n-Butane	6.576f	3845	0.120	ppm

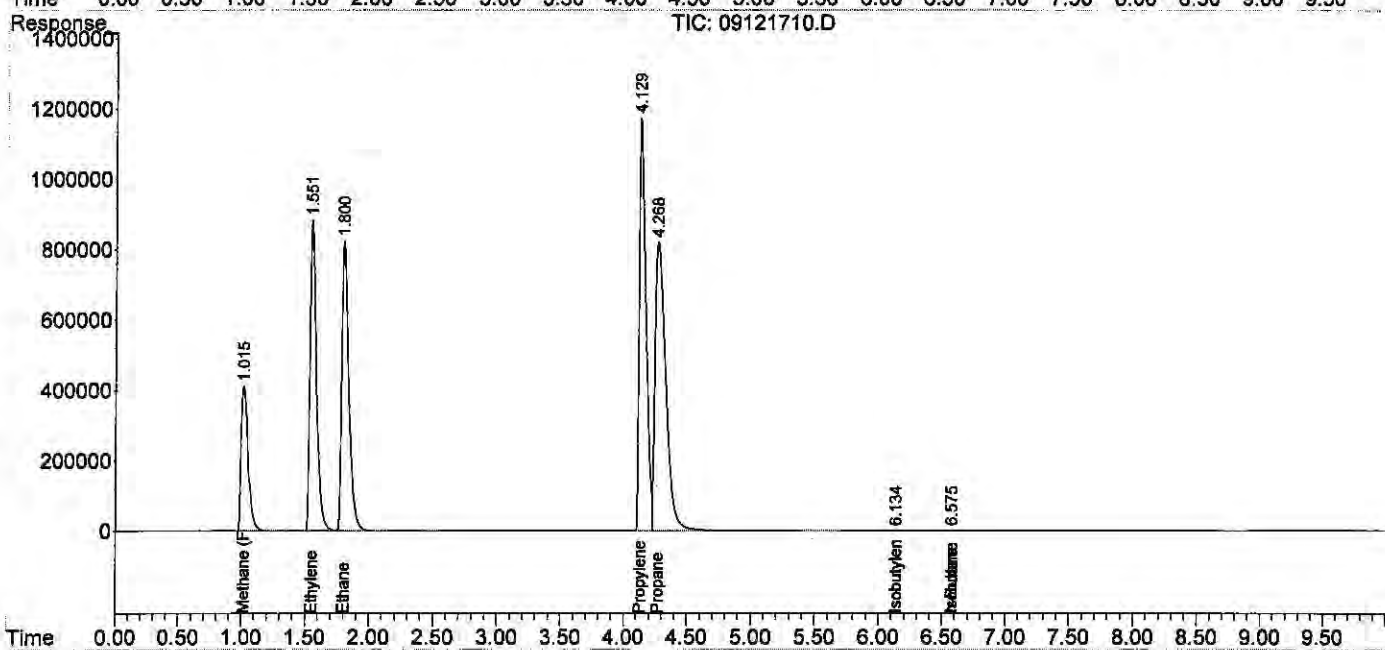
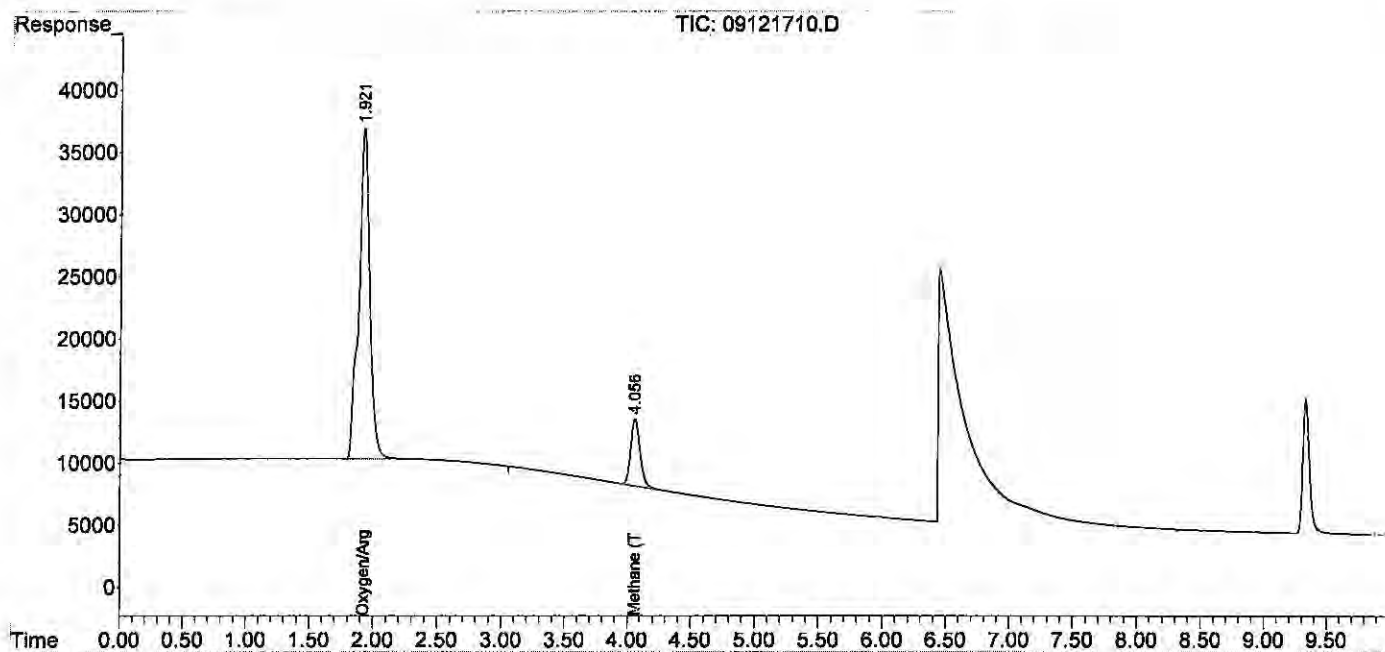
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
 Data File : 09121710.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 12-Sep-2017, 14:07
 Operator : MC
 Sample : 2000ppm 1ml s32-09121701
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Sep 13 11:12:33 2017
 Quant Method : J:\GC10\METHODS\RS091217 R.M
 Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 QLast Update : Wed Sep 13 11:12:25 2017
 Response via : Initial Calibration
 Integrator: ChemStation

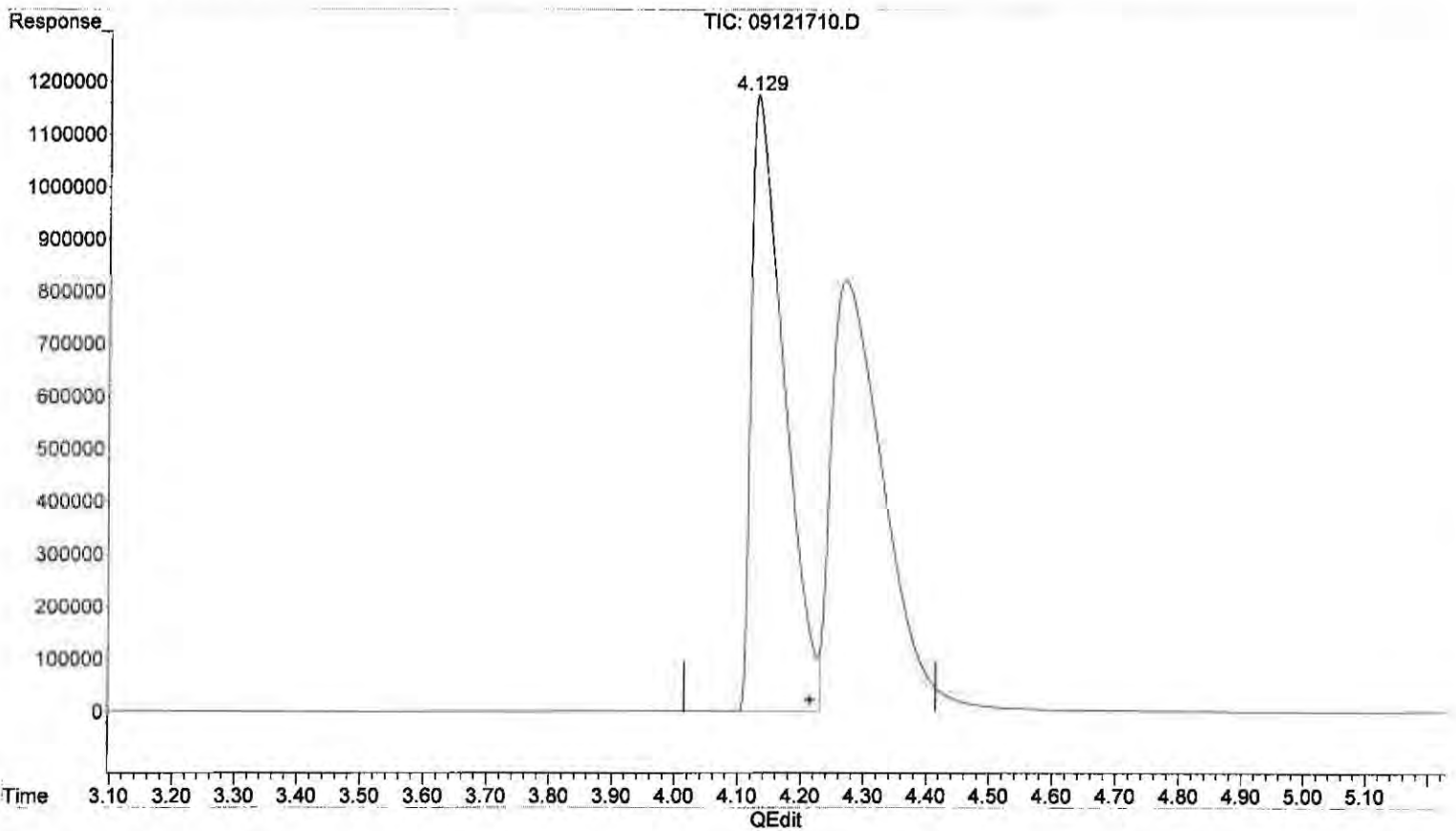
Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :



Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
 Data File : 09121710.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 12-Sep-2017, 14:07
 Operator : MC
 Sample : 2000ppm 1ml s32-09121701
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Sep 13 11:12:33 2017
 Quant Method : J:\GC10\METHODS\RS091217_R.M
 Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 QLast Update : Wed Sep 13 11:12:25 2017
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :



(9) Propylene
 4.129min 1775.341 ppm m
 response 42124690

*Mz 41/37
 WP
 Mo
 Pres
 9/21/17*

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
 Data File : 09121711.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 12-Sep-2017, 14:48
 Operator : MC
 Sample : 4000ppm 0.1ml s32-08231701
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Sep 13 11:13:37 2017
 Quant Method : J:\GC10\METHODS\RS091217_R.M
 Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 QLast Update : Wed Sep 13 11:13:29 2017
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :

Compound	R.T.	Response	Conc	Units

Target Compounds				
1) Oxygen/Argon	0.000	0	N.D.	ppm d
2) Carbon monoxide	0.000	0	N.D.	ppm d
3) Methane (TCD)	0.000	0	N.D.	ppm d
4) Carbon dioxide	0.000	0	N.D.	ppm d
6) Methane (FID)	1.059	35776839	3925.122	ppm
7) Ethylene	0.000	0	N.D.	ppm
8) Ethane	0.000	0	N.D.	ppm
9) Propylene	0.000	0	N.D.	ppm
10) Propane	0.000	0	N.D.	ppm
11) Isobutylene	0.000	0	N.D.	ppm
12) Isobutane	0.000	0	N.D.	ppm
13) n-Butane	0.000	0	N.D.	ppm

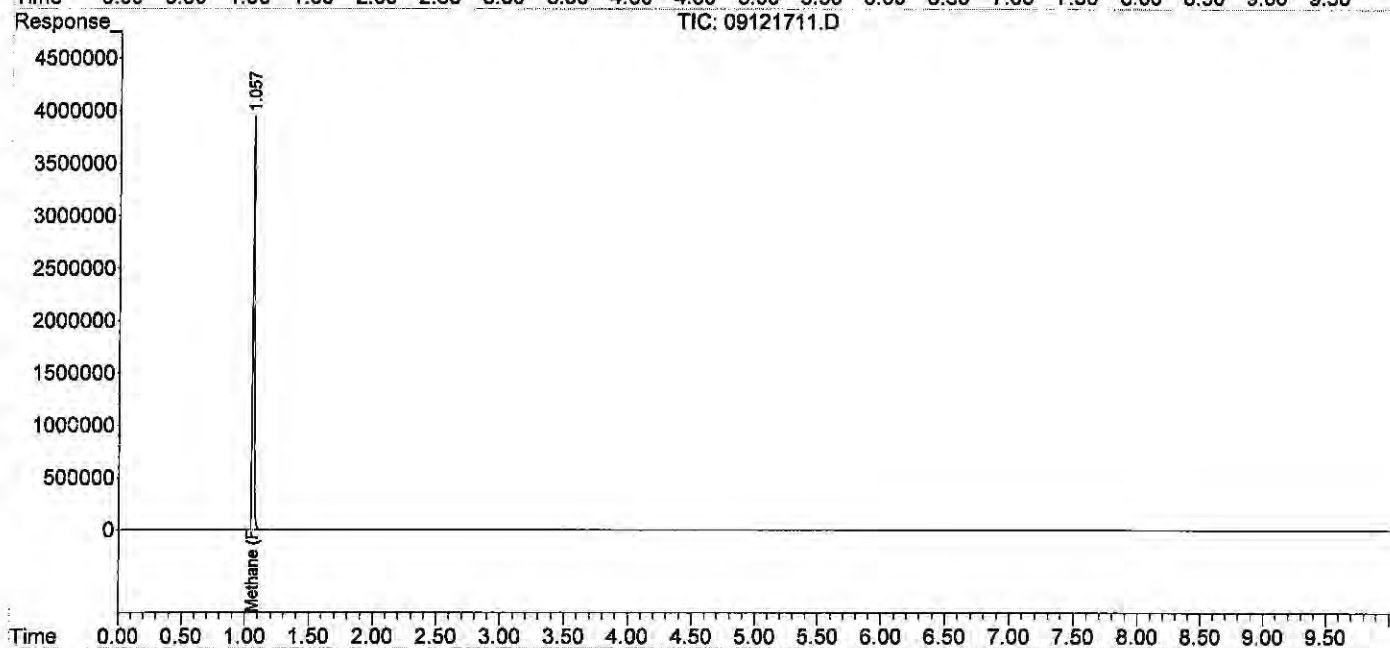
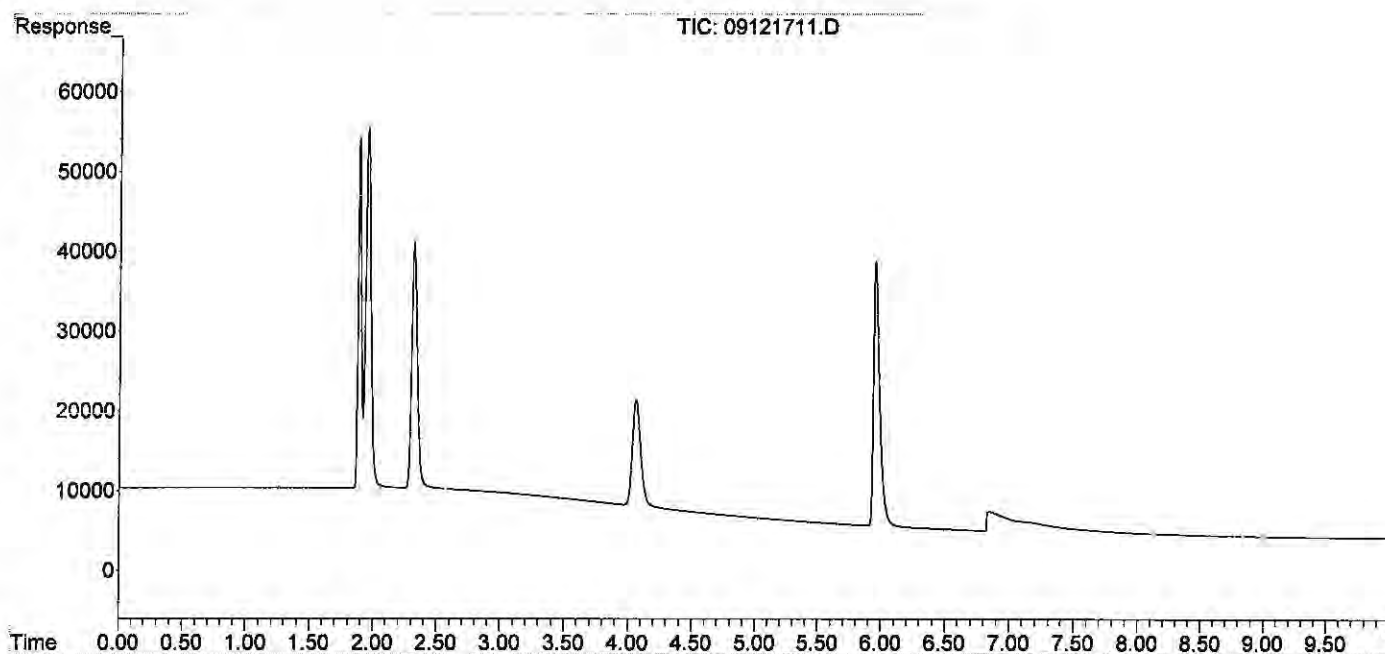
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
 Data File : 09121711.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 12-Sep-2017, 14:48
 Operator : MC
 Sample : 4000ppm 0.1ml s32-08231701
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Sep 13 11:13:37 2017
 Quant Method : J:\GC10\METHODS\RS091217_R.M
 Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 QLast Update : Wed Sep 13 11:13:29 2017
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :



Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
 Data File : 09121712.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 12-Sep-2017, 15:21
 Operator : MC
 Sample : 20000ppm 0.5ml s32-08231701
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Sep 13 11:14:17 2017
 Quant Method : J:\GC10\METHODS\RS091217_R.M
 Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 QLast Update : Wed Sep 13 11:13:29 2017
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :

Compound	R.T.	Response	Conc	Units
Target Compounds				
1) Oxygen/Argon	0.000	0	N.D.	ppm d
2) Carbon monoxide	1.836	3190788	N.D.	ppm
3) Methane (TCD)	0.000	0	N.D.	ppm d
4) Carbon dioxide	0.000	0	N.D.	ppm d
6) Methane (FID)	1.034	169009160	18492.064	ppm
7) Ethylene	0.000	0	N.D.	ppm
8) Ethane	0.000	0	N.D.	ppm
9) Propylene	0.000	0	N.D.	ppm
10) Propane	0.000	0	N.D.	ppm
11) Isobutylene	0.000	0	N.D.	ppm
12) Isobutane	0.000	0	N.D.	ppm
13) n-Butane	0.000	0	N.D.	ppm

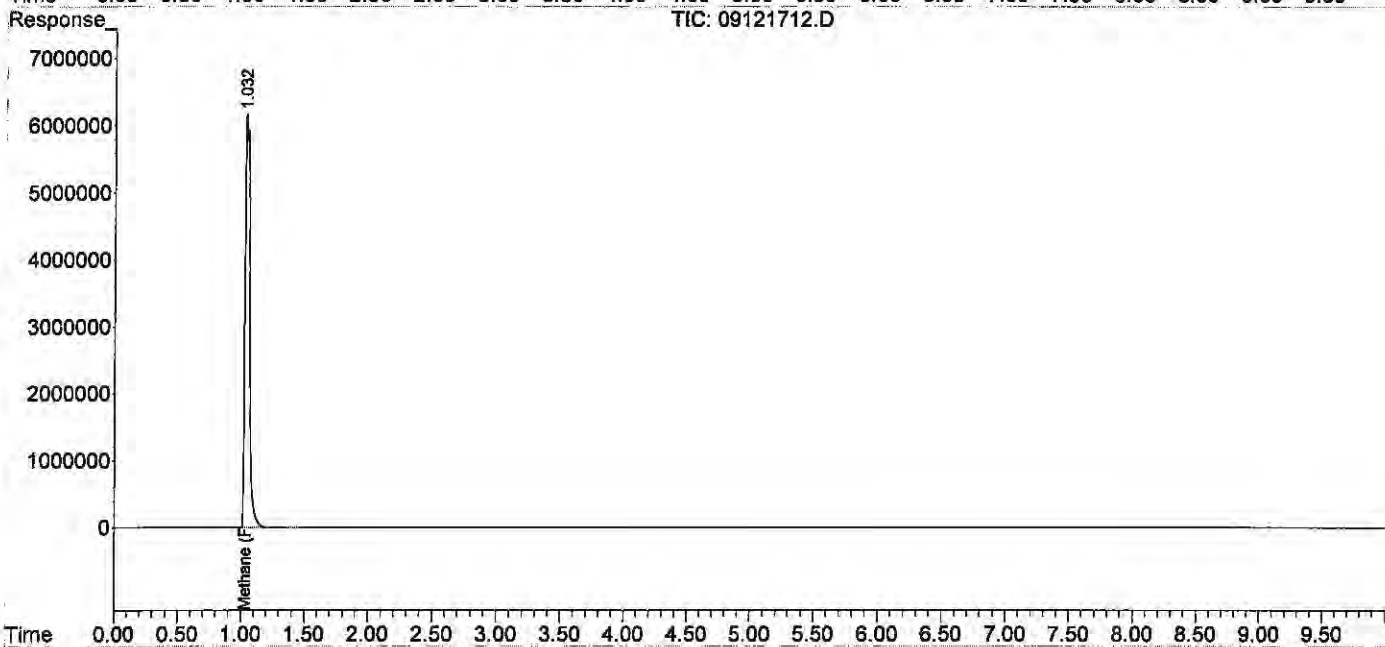
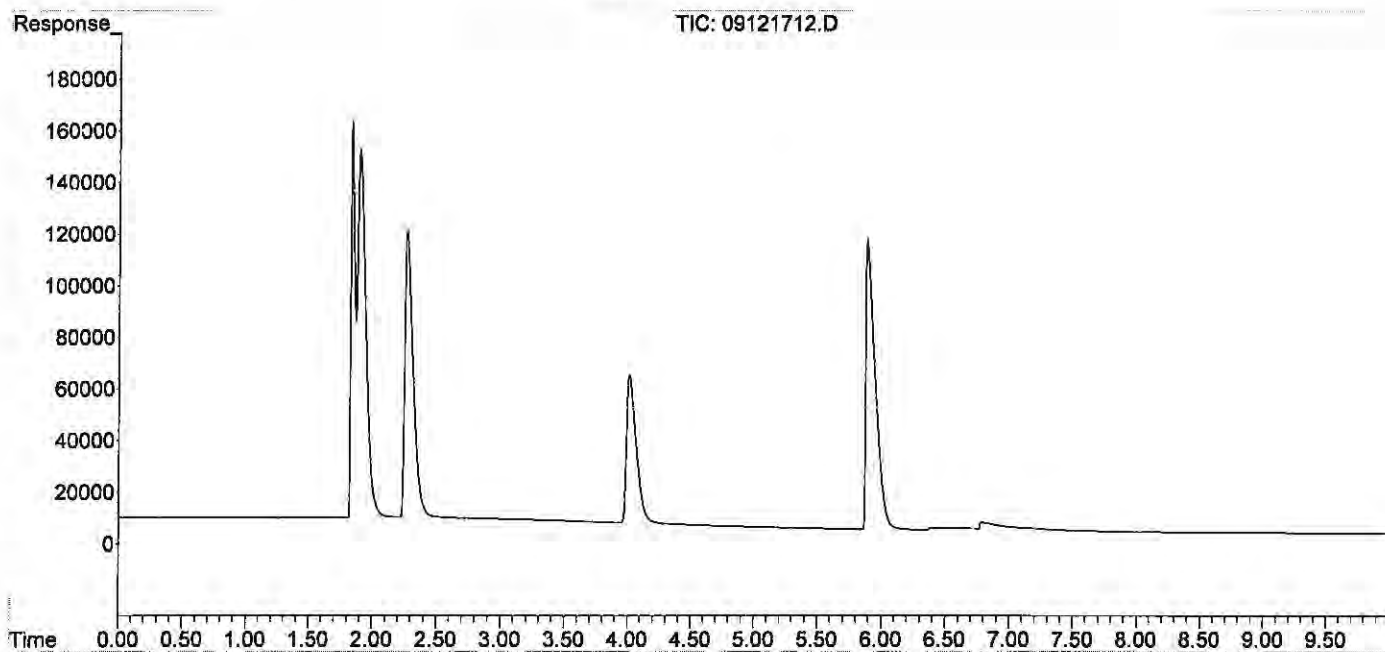
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
 Data File : 09121712.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 12-Sep-2017, 15:21
 Operator : MC
 Sample : 20000ppm 0.5ml s32-08231701
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Sep 13 11:14:17 2017
 Quant Method : J:\GC10\METHODS\RS091217_R.M
 Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 QLast Update : Wed Sep 13 11:13:29 2017
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :



Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
 Data File : 09121715.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 12-Sep-2017, 16:15
 Operator : MC
 Sample : icv s30-05241604
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Sep 13 11:15:11 2017
 Quant Method : J:\GC10\METHODS\RS091217_R.M
 Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 QLast Update : Wed Sep 13 11:13:29 2017
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :

Compound	R.T.	Response	Conc	Units
Target Compounds				
1) Oxygen/Argon	1.843	2922459	3.687	ppm
2) Carbon monoxide	1.843	2922459	N.D.	ppm
3) Methane (TCD)	0.000	0	N.D.	ppm <i>actual 2/1</i>
4) Carbon dioxide	0.000	0	N.D.	ppm
6) Methane (FID)	1.063	13748	1.516	ppm <i>1.50 101.1</i>
7) Ethylene	1.598	24153	1.443	ppm <i>1.50 96.2</i>
8) Ethane	1.850	24488	1.445	ppm <i>1.50 96.3</i>
9) Propylene	4.221	36004	1.537	ppm <i>1.50 102.5</i>
10) Propane	4.350	37738	1.517	ppm <i>1.50 100.5</i>
11) Isobutylene	0.000	0	N.D.	ppm
12) Isobutane	6.579f	48019	1.804	ppm <i>9/14/2</i>
13) n-Butane	6.579f	48019	1.804	ppm

(f)=RT Delta > 1/2 Window

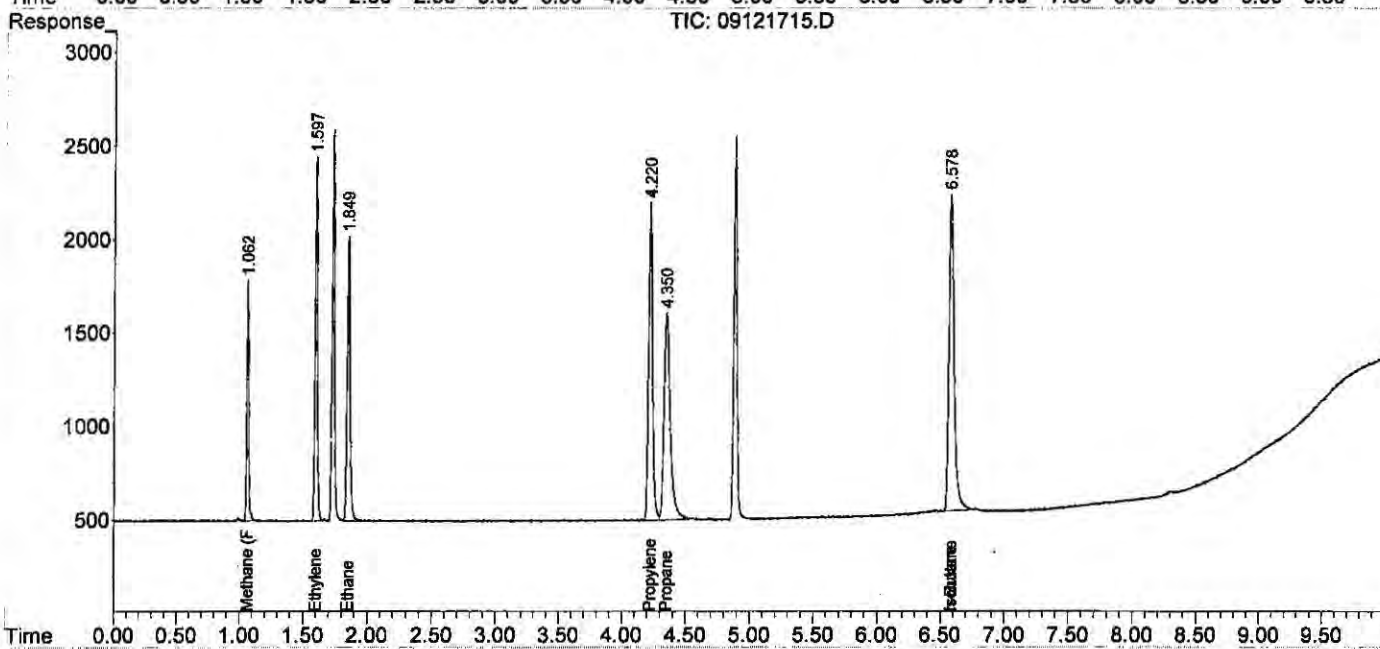
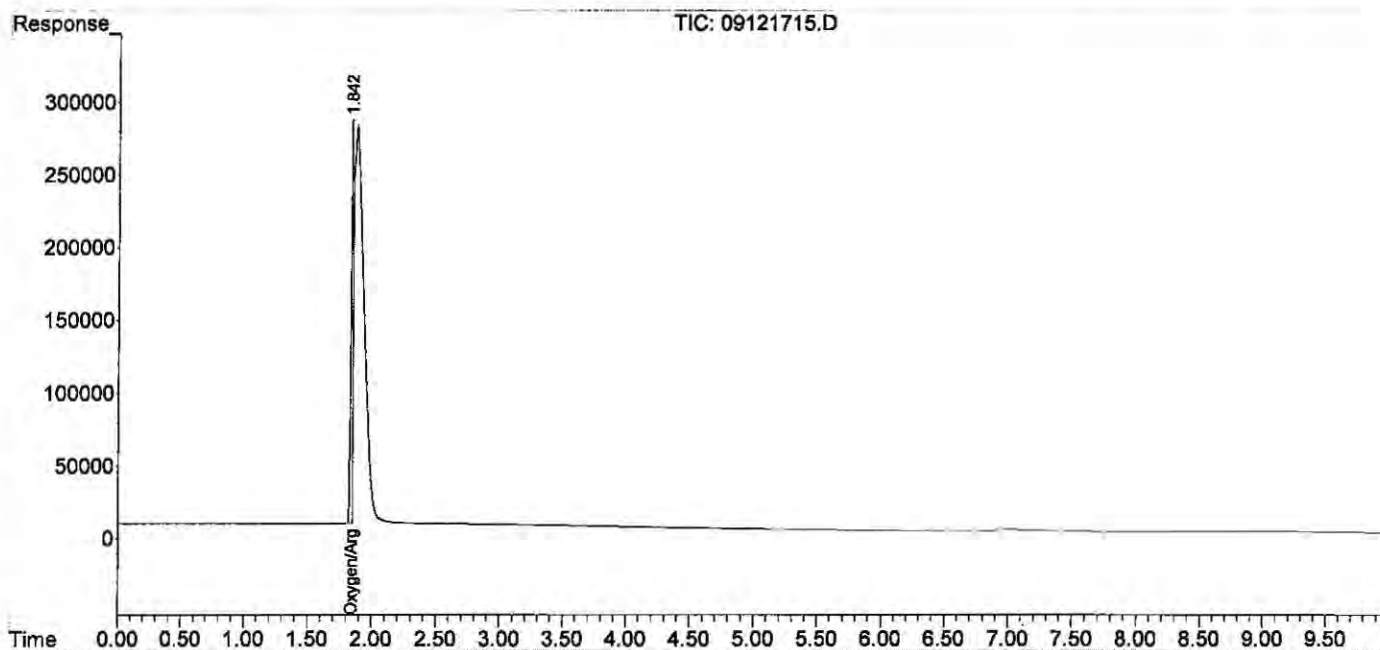
(m)=manual int.

W. J. Z. A.

Data Path : J:\GC10\DATA\RSK_FID\2017_09\12\
 Data File : 09121715.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 12-Sep-2017, 16:15
 Operator : MC
 Sample : icv s30-05241604
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Sep 13 11:15:11 2017
 Quant Method : J:\GC10\METHODS\RS091217_R.M
 Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 QLast Update : Wed Sep 13 11:13:29 2017
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :



ALS Environmental

Method : RSK175 Headspace Method for Dissolved Hydrocarbon in Water by FID/TCD

Client : ALS Laboratory Group

Analyst : WH

Instrument : GC#10

Date Analysis : 08/14/19

Detector : FID#10, TCD#10

Head Space Vol.(ml) : 8.00 ml

Gas Constant : 24.05684 (20°C)

Service Request: P1904717

Sample Vol. (ml) : 32.00 ml

HEAD SPACE RESULT (ppm)

FINAL HEAD SPACE RESULT (ppm)

Sample ID	Ini. Vol.	Methane	Ethylene	Ethane	Methane	Ethylene	Ethane
STD s32-05221901	0.100	90.114	97.459	98.247	16.04	28.05	30.07
ACTUAL		101.50	100.90	101.40	3.76E+04	1.02E+04	2.63E+04
%Difference		11.2%	3.4%	3.1%	1.30	1.00	0.60
MCS 0.1ml	0.100	0.098	0.000	0.000	MCS 0.1ml	0.000	0.000
rb 0.1ml	0.100	0.043	0.000	0.000			
FID LCS 0.1ml	0.100	1.433	0.984	1.236	FID LCS 0.1ml	9.840	12.360
FID LCSD 0.1ml	0.100	1.391	1.002	1.254	FID LCSD 0.1ml	10.020	12.540
P1904717-001 0.1ml	0.100	0.067	0.000	0.000	P1904717-001 0.1ml	0.670	0.000
P1904717-002 0.1ml	0.100	2.419	0.000	0.000	P1904717-002 0.1ml	24.190	0.000
P1904717-003 0.1ml	0.100	0.058	0.000	0.000	P1904717-003 0.1ml	0.580	0.000

WWL
HENRY'S CONSTANT
RL

STD s32-05221901	88.672	96.265	97.060
ACTUAL	101.50	100.90	101.40
%Difference	12.6%	4.6%	4.3%

Data Path : J:\GC10\DATA\RSK_FID\2019_08\14\
 Data File : 08141901.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 14-Aug-2019, 10:41:44
 Operator : WH
 Sample : STD s32-05221901
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Aug 14 10:59:52 2019
 Quant Method : I:\GC10\METHODS\RS091217_R.M
 Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 QLast Update : Wed Sep 13 11:14:47 2017
 Response via : Initial Calibration
 Integrator: ChemStation

Handwritten signature

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :

Compound	R.T.	Response	Conc	Units

Target Compounds				
1) Oxygen/Argon	0.000	0	N.D.	ppm
2) Carbon monoxide	0.000	0	N.D.	ppm
3) Methane (TCD)	0.000	0	N.D.	ppm
4) Carbon dioxide	0.000	0	N.D.	ppm
6) Methane (FID)	1.108	817388	90.114	ppm
7) Ethylene	1.646	1630916	97.459	ppm
8) Ethane	1.900	1665309	98.247	ppm
9) Propylene	4.285	2397672	102.327	ppm
10) Propane	4.410	2509922	100.880	ppm
11) Isobutylene	0.000	0	N.D.	ppm
12) Isobutane	0.000	0	N.D.	ppm
13) n-Butane	0.000	0	N.D.	ppm

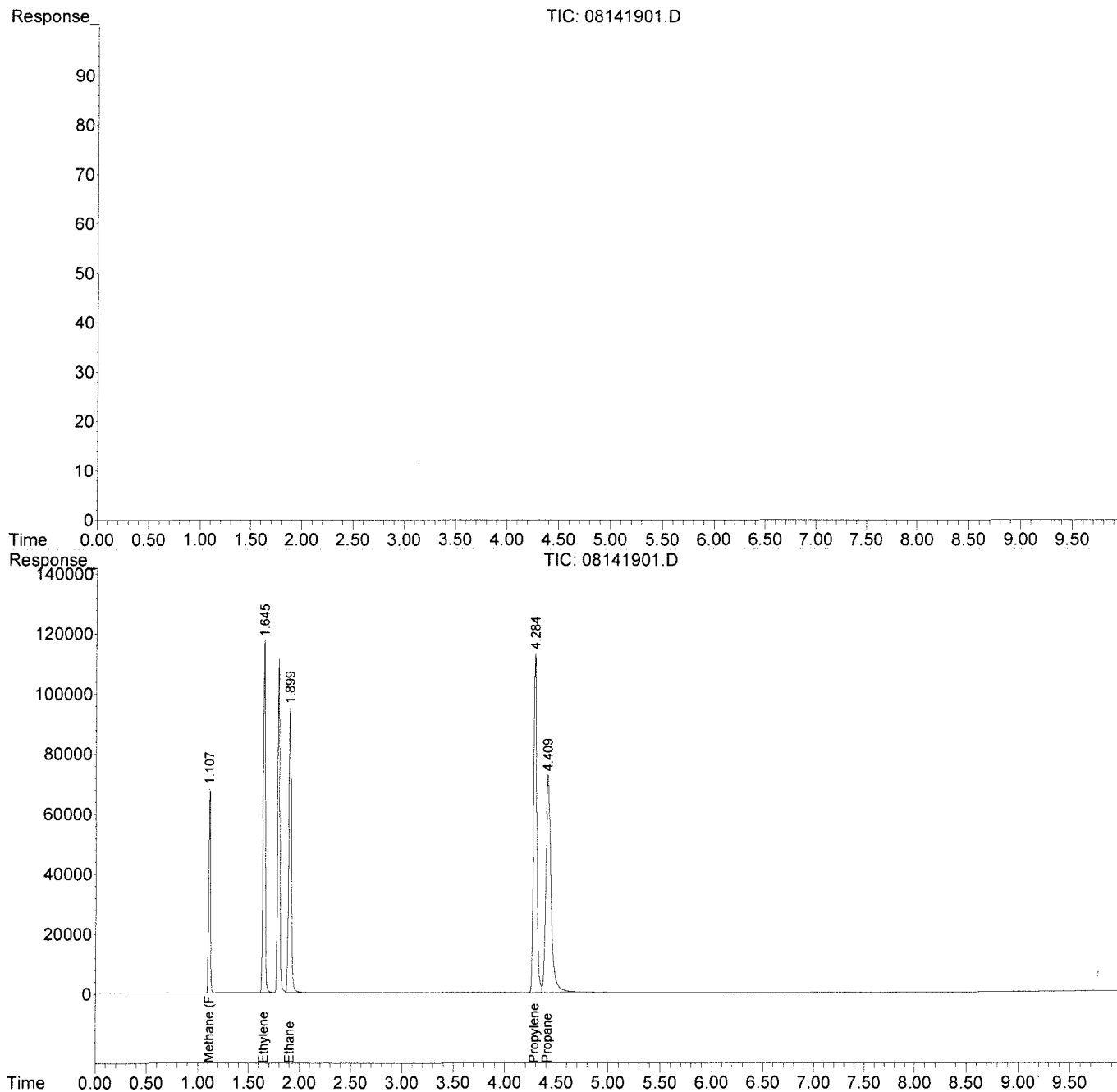
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2019_08\14\
Data File : 08141901.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 14-Aug-2019, 10:41:44
Operator : WH
Sample : STD s32-05221901
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 14 10:59:52 2019
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



Data Path : J:\GC10\DATA\RSK_FID\2019_08\14\
 Data File : 08141909.D
 Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
 Acq On : 14-Aug-2019, 12:45:22
 Operator : WH
 Sample : STD s32-05221901
 Misc :
 ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
 Integration File signal 2: autoint2.e
 Quant Time: Aug 14 12:52:15 2019
 Quant Method : I:\GC10\METHODS\RS091217_R.M
 Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
 QLast Update : Wed Sep 13 11:14:47 2017
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. :
 Signal #1 Phase : Signal #2 Phase:
 Signal #1 Info : Signal #2 Info :

Compound	R.T.	Response	Conc	Units

Target Compounds				
1) Oxygen/Argon	0.000	0	N.D.	ppm
2) Carbon monoxide	0.000	0	N.D.	ppm
3) Methane (TCD)	0.000	0	N.D.	ppm
4) Carbon dioxide	0.000	0	N.D.	ppm
6) Methane (FID)	1.107	804313	88.672	ppm
7) Ethylene	1.651	1610934	96.265	ppm
8) Ethane	1.907	1645181	97.060	ppm
9) Propylene	4.290	2378617	101.514	ppm
10) Propane	4.415	2488792	100.031	ppm
11) Isobutylene	0.000	0	N.D.	ppm
12) Isobutane	0.000	0	N.D.	ppm
13) n-Butane	0.000	0	N.D.	ppm

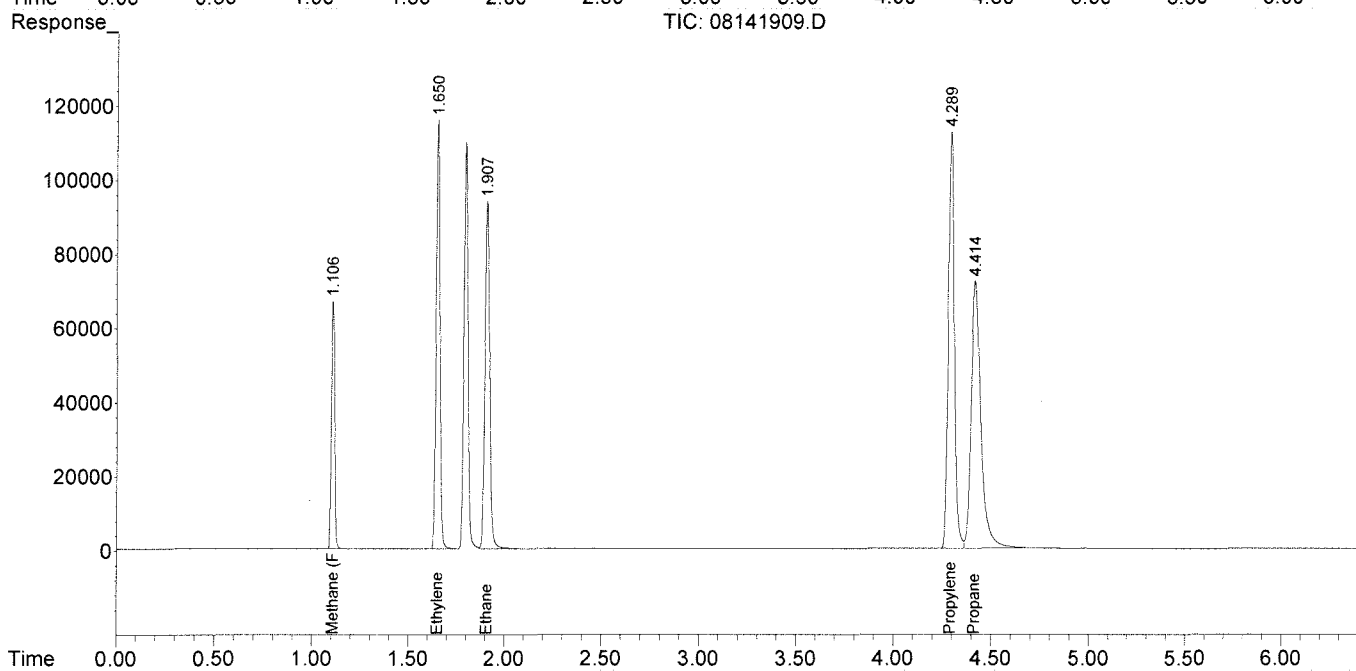
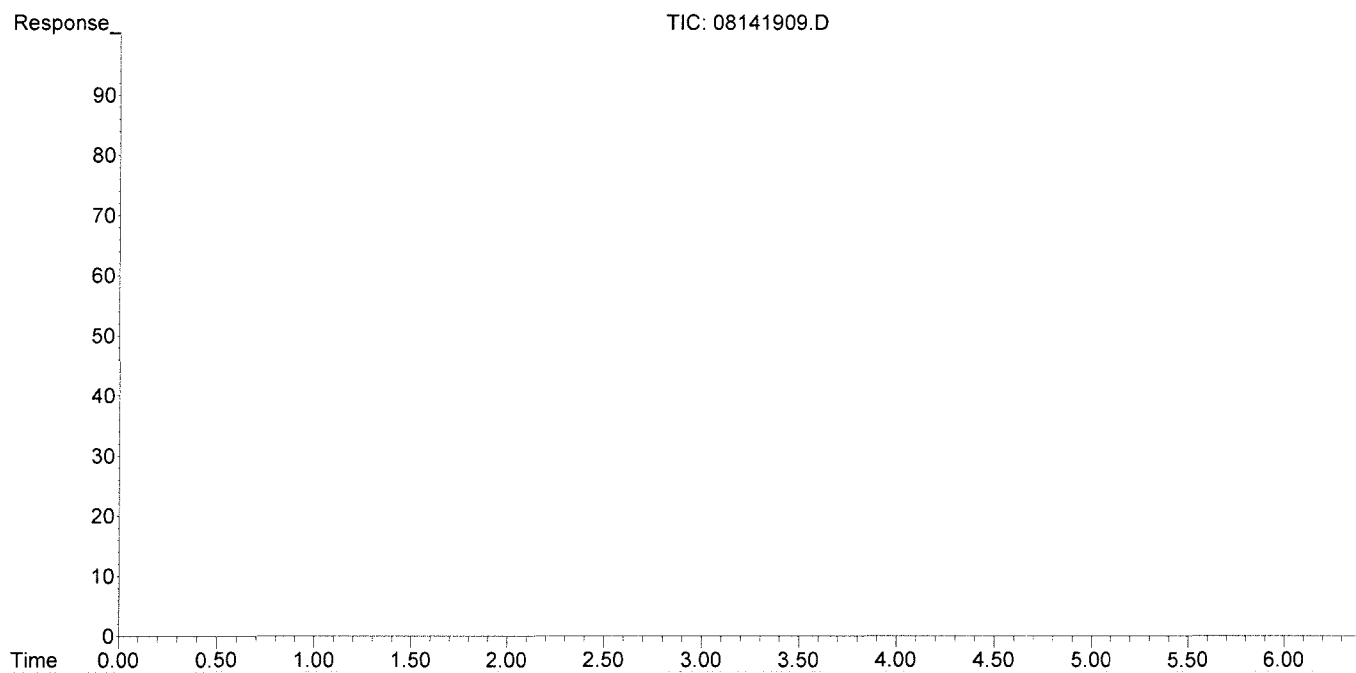
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC10\DATA\RSK_FID\2019_08\14\
Data File : 08141909.D
Signal(s) : Signal #1: TCD1A.CH Signal #2: FID2B.CH
Acq On : 14-Aug-2019, 12:45:22
Operator : WH
Sample : STD s32-05221901
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 14 12:52:15 2019
Quant Method : I:\GC10\METHODS\RS091217_R.M
Quant Title : RSK175, VOA-DISGAS, VOA-TO3C1C6
QLast Update : Wed Sep 13 11:14:47 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



Injection Log

00957182

Directory: I:\GC10\DATA\RSK_FID\2017_09\12\

	Date/Time	File Name	Sample ID	Misc Info	Operator	Acquisition Method	Comments
1	12-Sep-17, 08:38:08	09121701.D	test		MC	RSKBOTH.M	
2	12-Sep-17, 10:52:40	09121702.D	0.151 ppm 0.250ml s32-09121702		MC	RSKBOTH.M	Curve
3	12-Sep-17, 11:05:49	09121703.D	0.302ppm 0.5ml s32-09121702		MC	RSKBOTH.M	Curve
4	12-Sep-17, 11:45:34	09121704.D	1.51ppm 0.1ml s32-09051701		MC	RSKBOTH.M	Curve
5	12-Sep-17, 12:09:33	09121705.D	4.53ppm 0.3ml s32-09051701		MC	RSKBOTH.M	Curve
6	12-Sep-17, 12:30:23	09121706.D	10.57ppm 0.7ml s32-09051701		MC	RSKBOTH.M	Curve
7	12-Sep-17, 12:47:18	09121707.D	200ppm 0.1ml s32-09121701		MC	RSKBOTH.M	Curve
8	12-Sep-17, 13:00:22	09121708.D	600ppm 0.3ml s32-09121701		MC	RSKBOTH.M	Curve
9	12-Sep-17, 13:47:48	09121709.D	1000ppm 0.5ml s32-09121701		MC	RSKBOTH.M	Curve
10	12-Sep-17, 14:07:58	09121710.D	2000ppm 1ml s32-09121701		MC	RSKBOTH.M	Curve
11	12-Sep-17, 14:48:48	09121711.D	4000ppm 0.1ml s32-08231701		MC	RSKBOTH.M	Curve
12	12-Sep-17, 15:21:51	09121712.D	20000ppm 0.5ml s32-08231701		MC	RSKBOTH.M	Curve
13	12-Sep-17, 15:38:59	09121713.D	mb 0.5ml		MC	RSKBOTH.M	Pass
14	12-Sep-17, 15:55:35	09121714.D	mb 0.1 ml		MC	RSKBOTH.M	Pass
15	12-Sep-17, 16:15:26	09121715.D	icv s30-05241604		MC	RSKBOTH.M	Pass



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August 12, 2019

Susan Huang
Aptim Environmental & Infrastructure, Inc.
2500 City West Blvd., Suite 1700
Houston, TX 77042

Work Order: **HS19080443**

Laboratory Results for: **Longhorn Army Ammunition Plant**

Dear Susan,

ALS Environmental received 8 sample(s) on Aug 08, 2019 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,

A handwritten signature in black ink, appearing to read "Raj. P. Modashia", enclosed in a simple oval scribble.

Generated By: DAYNA.FISHER

RJ Modashia
Project Manager

ALS Houston, US

Date: 12-ago-19

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
Work Order: HS19080443

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19080443-01	35BWW11-190807	Water		07-Aug-2019 08:00	08-Aug-2019 08:45	<input type="checkbox"/>
HS19080443-02	LHSMW58-190807	Water		07-Aug-2019 08:45	08-Aug-2019 08:45	<input type="checkbox"/>
HS19080443-03	35BWW24-190807	Water		07-Aug-2019 09:35	08-Aug-2019 08:45	<input type="checkbox"/>
HS19080443-04	35BWW25-190807	Water		07-Aug-2019 10:20	08-Aug-2019 08:45	<input type="checkbox"/>
HS19080443-05	35BWW16-190807	Water		07-Aug-2019 11:05	08-Aug-2019 08:45	<input type="checkbox"/>
HS19080443-06	35BWW17-190807	Water		07-Aug-2019 11:55	08-Aug-2019 08:45	<input type="checkbox"/>
HS19080443-07	35BWW15-190807	Water		07-Aug-2019 12:45	08-Aug-2019 08:45	<input type="checkbox"/>
HS19080443-08	Trip Blank	Water		07-Aug-2019 00:00	08-Aug-2019 08:45	<input type="checkbox"/>

ALS Houston, US

Date: 12-Aug-19

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
Work Order: HS19080443

CASE NARRATIVE**GCMS Volatiles by Method SW8260****Batch ID: R344032****Sample ID: 35BWW17-190807 (HS19080443-06MS)**

- Some target analytes are outside recovery/RPD limits on MS/MSD due to sample matrix.

Sample ID: LHSMW58-190807 (HS19080443-02MS)

- Some target analytes are outside recovery/RPD limits on MS/MSD due to sample matrix.
-

ALS Houston, US

Date: 12-Aug-19

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 35BWW11-190807
 Collection Date: 07-Aug-2019 08:00

ANALYTICAL REPORT
 WorkOrder:HS19080443
 Lab ID:HS19080443-01
 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED	
VOLATILES ORGANICS BY METHOD 8260C		Method:SW8260							Analyst: AKP
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 05:04	
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 05:04	
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	10-Aug-2019 05:04	
1,1,2-Trichlor-1,2,2-trifluoroethane	0.50	U	0.50	0.50	1.0	UG/L	1	10-Aug-2019 05:04	
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 05:04	
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 05:04	
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 05:04	
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 05:04	
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Aug-2019 05:04	
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	10-Aug-2019 05:04	
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	10-Aug-2019 05:04	
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 05:04	
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 05:04	
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 05:04	
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	10-Aug-2019 05:04	
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 05:04	
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	10-Aug-2019 05:04	
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 05:04	
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Aug-2019 05:04	
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 05:04	
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Aug-2019 05:04	
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 05:04	
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	10-Aug-2019 05:04	
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 05:04	
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	10-Aug-2019 05:04	
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Aug-2019 05:04	
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 05:04	
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	10-Aug-2019 05:04	
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	10-Aug-2019 05:04	
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 05:04	
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Aug-2019 05:04	
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 05:04	
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 05:04	
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	10-Aug-2019 05:04	
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	10-Aug-2019 05:04	
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	10-Aug-2019 05:04	
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	10-Aug-2019 05:04	
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 05:04	
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 05:04	

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

ALS Houston, US

Date: 12-Aug-19

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 35BWW11-190807
 Collection Date: 07-Aug-2019 08:00

ANALYTICAL REPORT
 WorkOrder:HS19080443
 Lab ID:HS19080443-01
 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED	
VOLATILES ORGANICS BY METHOD 8260C		Method:SW8260							Analyst: AKP
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 05:04	
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 05:04	
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 05:04	
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	10-Aug-2019 05:04	
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 05:04	
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 05:04	
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 05:04	
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 05:04	
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	10-Aug-2019 05:04	
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 05:04	
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	10-Aug-2019 05:04	
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	10-Aug-2019 05:04	
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Aug-2019 05:04	
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 05:04	
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 05:04	
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 05:04	
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 05:04	
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 05:04	
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 05:04	
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 05:04	
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 05:04	
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 05:04	
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 05:04	
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 05:04	
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 05:04	
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 05:04	
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>88.4</i>			<i>0</i>	<i>81-118</i>	<i>%REC</i>	<i>1</i>	<i>10-Aug-2019 05:04</i>	
<i>Surr: 4-Bromofluorobenzene</i>	<i>102</i>			<i>0</i>	<i>85-114</i>	<i>%REC</i>	<i>1</i>	<i>10-Aug-2019 05:04</i>	
<i>Surr: Dibromofluoromethane</i>	<i>91.7</i>			<i>0</i>	<i>80-119</i>	<i>%REC</i>	<i>1</i>	<i>10-Aug-2019 05:04</i>	
<i>Surr: Toluene-d8</i>	<i>102</i>			<i>0</i>	<i>89-112</i>	<i>%REC</i>	<i>1</i>	<i>10-Aug-2019 05:04</i>	

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

ALS Houston, US

Date: 12-Aug-19

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: LHSMW58-190807
 Collection Date: 07-Aug-2019 08:45

ANALYTICAL REPORT
 WorkOrder:HS19080443
 Lab ID:HS19080443-02
 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED	
VOLATILES ORGANICS BY METHOD 8260C		Method:SW8260							Analyst: AKP
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 01:04	
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 01:04	
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	10-Aug-2019 01:04	
1,1,2-Trichlor-1,2,2-trifluoroethane	1.7		0.50	0.50	1.0	UG/L	1	10-Aug-2019 01:04	
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 01:04	
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 01:04	
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 01:04	
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 01:04	
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Aug-2019 01:04	
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	10-Aug-2019 01:04	
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	10-Aug-2019 01:04	
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 01:04	
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 01:04	
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 01:04	
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	10-Aug-2019 01:04	
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 01:04	
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	10-Aug-2019 01:04	
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 01:04	
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Aug-2019 01:04	
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 01:04	
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Aug-2019 01:04	
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 01:04	
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	10-Aug-2019 01:04	
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 01:04	
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	10-Aug-2019 01:04	
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Aug-2019 01:04	
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 01:04	
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	10-Aug-2019 01:04	
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	10-Aug-2019 01:04	
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 01:04	
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Aug-2019 01:04	
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 01:04	
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 01:04	
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	10-Aug-2019 01:04	
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	10-Aug-2019 01:04	
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	10-Aug-2019 01:04	
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	10-Aug-2019 01:04	
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 01:04	

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

ALS Houston, US

Date: 12-Aug-19

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: LHSMW58-190807
 Collection Date: 07-Aug-2019 08:45

ANALYTICAL REPORT
 WorkOrder:HS19080443
 Lab ID:HS19080443-02
 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED	
VOLATILES ORGANICS BY METHOD 8260C		Method:SW8260						Analyst: AKP	
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 01:04	
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 01:04	
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 01:04	
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 01:04	
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	10-Aug-2019 01:04	
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 01:04	
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 01:04	
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 01:04	
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 01:04	
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	10-Aug-2019 01:04	
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 01:04	
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	10-Aug-2019 01:04	
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	10-Aug-2019 01:04	
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Aug-2019 01:04	
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 01:04	
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 01:04	
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 01:04	
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 01:04	
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 01:04	
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 01:04	
Tetrachloroethene	6.8		0.30	0.50	1.0	UG/L	1	10-Aug-2019 01:04	
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 01:04	
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 01:04	
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 01:04	
Trichloroethene	0.59	J	0.20	0.50	1.0	UG/L	1	10-Aug-2019 01:04	
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 01:04	
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 01:04	
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>90.0</i>			0	<i>81-118</i>	<i>%REC</i>	1	<i>10-Aug-2019 01:04</i>	
<i>Surr: 4-Bromofluorobenzene</i>	<i>98.4</i>			0	<i>85-114</i>	<i>%REC</i>	1	<i>10-Aug-2019 01:04</i>	
<i>Surr: Dibromofluoromethane</i>	<i>92.6</i>			0	<i>80-119</i>	<i>%REC</i>	1	<i>10-Aug-2019 01:04</i>	
<i>Surr: Toluene-d8</i>	<i>102</i>			0	<i>89-112</i>	<i>%REC</i>	1	<i>10-Aug-2019 01:04</i>	

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

ALS Houston, US

Date: 12-Aug-19

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 35BWW24-190807
 Collection Date: 07-Aug-2019 09:35

ANALYTICAL REPORT
 WorkOrder:HS19080443
 Lab ID:HS19080443-03
 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED	
VOLATILES ORGANICS BY METHOD 8260C		Method:SW8260							Analyst: AKP
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 05:28	
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 05:28	
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	10-Aug-2019 05:28	
1,1,2-Trichlor-1,2,2-trifluoroethane	6.1		0.50	0.50	1.0	UG/L	1	10-Aug-2019 05:28	
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 05:28	
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 05:28	
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 05:28	
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 05:28	
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Aug-2019 05:28	
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	10-Aug-2019 05:28	
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	10-Aug-2019 05:28	
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 05:28	
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 05:28	
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 05:28	
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	10-Aug-2019 05:28	
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 05:28	
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	10-Aug-2019 05:28	
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 05:28	
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Aug-2019 05:28	
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 05:28	
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Aug-2019 05:28	
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 05:28	
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	10-Aug-2019 05:28	
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 05:28	
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	10-Aug-2019 05:28	
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Aug-2019 05:28	
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 05:28	
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	10-Aug-2019 05:28	
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	10-Aug-2019 05:28	
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 05:28	
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Aug-2019 05:28	
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 05:28	
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 05:28	
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	10-Aug-2019 05:28	
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	10-Aug-2019 05:28	
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	10-Aug-2019 05:28	
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	10-Aug-2019 05:28	
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 05:28	

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

ALS Houston, US

Date: 12-Aug-19

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 35BWW24-190807
 Collection Date: 07-Aug-2019 09:35

ANALYTICAL REPORT
 WorkOrder:HS19080443
 Lab ID:HS19080443-03
 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED	
VOLATILES ORGANICS BY METHOD 8260C		Method:SW8260							Analyst: AKP
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 05:28	
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 05:28	
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 05:28	
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 05:28	
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	10-Aug-2019 05:28	
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 05:28	
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 05:28	
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 05:28	
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 05:28	
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	10-Aug-2019 05:28	
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 05:28	
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	10-Aug-2019 05:28	
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	10-Aug-2019 05:28	
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Aug-2019 05:28	
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 05:28	
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 05:28	
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 05:28	
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 05:28	
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 05:28	
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 05:28	
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 05:28	
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 05:28	
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 05:28	
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 05:28	
Trichloroethene	1.7		0.20	0.50	1.0	UG/L	1	10-Aug-2019 05:28	
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 05:28	
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 05:28	
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>88.5</i>			0	<i>81-118</i>	<i>%REC</i>	1	10-Aug-2019 05:28	
<i>Surr: 4-Bromofluorobenzene</i>	<i>98.9</i>			0	<i>85-114</i>	<i>%REC</i>	1	10-Aug-2019 05:28	
<i>Surr: Dibromofluoromethane</i>	<i>91.9</i>			0	<i>80-119</i>	<i>%REC</i>	1	10-Aug-2019 05:28	
<i>Surr: Toluene-d8</i>	<i>102</i>			0	<i>89-112</i>	<i>%REC</i>	1	10-Aug-2019 05:28	

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

ALS Houston, US

Date: 12-Aug-19

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 35BWW25-190807
 Collection Date: 07-Aug-2019 10:20

ANALYTICAL REPORT
 WorkOrder:HS19080443
 Lab ID:HS19080443-04
 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED	
VOLATILES ORGANICS BY METHOD 8260C		Method:SW8260							Analyst: AKP
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 05:52	
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 05:52	
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	10-Aug-2019 05:52	
1,1,2-Trichlor-1,2,2-trifluoroethane	0.50	U	0.50	0.50	1.0	UG/L	1	10-Aug-2019 05:52	
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 05:52	
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 05:52	
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 05:52	
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 05:52	
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Aug-2019 05:52	
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	10-Aug-2019 05:52	
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	10-Aug-2019 05:52	
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 05:52	
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 05:52	
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 05:52	
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	10-Aug-2019 05:52	
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 05:52	
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	10-Aug-2019 05:52	
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 05:52	
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Aug-2019 05:52	
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 05:52	
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Aug-2019 05:52	
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 05:52	
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	10-Aug-2019 05:52	
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 05:52	
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	10-Aug-2019 05:52	
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Aug-2019 05:52	
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 05:52	
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	10-Aug-2019 05:52	
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	10-Aug-2019 05:52	
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 05:52	
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Aug-2019 05:52	
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 05:52	
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 05:52	
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	10-Aug-2019 05:52	
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	10-Aug-2019 05:52	
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	10-Aug-2019 05:52	
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	10-Aug-2019 05:52	
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 05:52	
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 05:52	

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

ALS Houston, US

Date: 12-Aug-19

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 35BWW25-190807
 Collection Date: 07-Aug-2019 10:20

ANALYTICAL REPORT
 WorkOrder:HS19080443
 Lab ID:HS19080443-04
 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED	
VOLATILES ORGANICS BY METHOD 8260C		Method:SW8260							Analyst: AKP
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 05:52	
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 05:52	
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 05:52	
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	10-Aug-2019 05:52	
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 05:52	
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 05:52	
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 05:52	
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 05:52	
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	10-Aug-2019 05:52	
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 05:52	
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	10-Aug-2019 05:52	
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	10-Aug-2019 05:52	
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Aug-2019 05:52	
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 05:52	
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 05:52	
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 05:52	
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 05:52	
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 05:52	
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 05:52	
Tetrachloroethene	0.33	J	0.30	0.50	1.0	UG/L	1	10-Aug-2019 05:52	
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 05:52	
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 05:52	
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 05:52	
Trichloroethene	15		0.20	0.50	1.0	UG/L	1	10-Aug-2019 05:52	
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 05:52	
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 05:52	
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>88.7</i>			0	<i>81-118</i>	%REC	1	10-Aug-2019 05:52	
<i>Surr: 4-Bromofluorobenzene</i>	<i>103</i>			0	<i>85-114</i>	%REC	1	10-Aug-2019 05:52	
<i>Surr: Dibromofluoromethane</i>	<i>91.6</i>			0	<i>80-119</i>	%REC	1	10-Aug-2019 05:52	
<i>Surr: Toluene-d8</i>	<i>102</i>			0	<i>89-112</i>	%REC	1	10-Aug-2019 05:52	

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

ALS Houston, US

Date: 12-Aug-19

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 35BWW16-190807
 Collection Date: 07-Aug-2019 11:05

ANALYTICAL REPORT
 WorkOrder:HS19080443
 Lab ID:HS19080443-05
 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED	
VOLATILES ORGANICS BY METHOD 8260C		Method:SW8260							Analyst: AKP
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 06:17	
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 06:17	
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	10-Aug-2019 06:17	
1,1,2-Trichlor-1,2,2-trifluoroethane	11		0.50	0.50	1.0	UG/L	1	10-Aug-2019 06:17	
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 06:17	
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 06:17	
1,1-Dichloroethene	0.79	J	0.20	0.50	1.0	UG/L	1	10-Aug-2019 06:17	
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 06:17	
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Aug-2019 06:17	
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	10-Aug-2019 06:17	
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	10-Aug-2019 06:17	
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 06:17	
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 06:17	
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 06:17	
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	10-Aug-2019 06:17	
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 06:17	
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	10-Aug-2019 06:17	
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 06:17	
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Aug-2019 06:17	
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 06:17	
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Aug-2019 06:17	
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 06:17	
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	10-Aug-2019 06:17	
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 06:17	
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	10-Aug-2019 06:17	
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Aug-2019 06:17	
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 06:17	
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	10-Aug-2019 06:17	
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	10-Aug-2019 06:17	
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 06:17	
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Aug-2019 06:17	
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 06:17	
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 06:17	
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	10-Aug-2019 06:17	
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	10-Aug-2019 06:17	
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	10-Aug-2019 06:17	
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	10-Aug-2019 06:17	
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 06:17	

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

ALS Houston, US

Date: 12-Aug-19

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 35BWW16-190807
 Collection Date: 07-Aug-2019 11:05

ANALYTICAL REPORT
 WorkOrder:HS19080443
 Lab ID:HS19080443-05
 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED	
VOLATILES ORGANICS BY METHOD 8260C		Method:SW8260						Analyst: AKP	
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 06:17	
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 06:17	
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 06:17	
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 06:17	
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	10-Aug-2019 06:17	
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 06:17	
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 06:17	
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 06:17	
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 06:17	
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	10-Aug-2019 06:17	
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 06:17	
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	10-Aug-2019 06:17	
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	10-Aug-2019 06:17	
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Aug-2019 06:17	
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 06:17	
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 06:17	
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 06:17	
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 06:17	
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 06:17	
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 06:17	
Tetrachloroethene	9.8		0.30	0.50	1.0	UG/L	1	10-Aug-2019 06:17	
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 06:17	
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 06:17	
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 06:17	
Trichloroethene	3.5		0.20	0.50	1.0	UG/L	1	10-Aug-2019 06:17	
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 06:17	
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 06:17	
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>87.7</i>			0	<i>81-118</i>	<i>%REC</i>	1	10-Aug-2019 06:17	
<i>Surr: 4-Bromofluorobenzene</i>	<i>101</i>			0	<i>85-114</i>	<i>%REC</i>	1	10-Aug-2019 06:17	
<i>Surr: Dibromofluoromethane</i>	<i>91.5</i>			0	<i>80-119</i>	<i>%REC</i>	1	10-Aug-2019 06:17	
<i>Surr: Toluene-d8</i>	<i>103</i>			0	<i>89-112</i>	<i>%REC</i>	1	10-Aug-2019 06:17	

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

ALS Houston, US

Date: 12-Aug-19

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 35BWW17-190807
 Collection Date: 07-Aug-2019 11:55

ANALYTICAL REPORT
 WorkOrder:HS19080443
 Lab ID:HS19080443-06
 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED	
VOLATILES ORGANICS BY METHOD 8260C		Method:SW8260							Analyst: AKP
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 01:28	
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 01:28	
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	10-Aug-2019 01:28	
1,1,2-Trichlor-1,2,2-trifluoroethane	0.50	U	0.50	0.50	1.0	UG/L	1	10-Aug-2019 01:28	
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 01:28	
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 01:28	
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 01:28	
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 01:28	
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Aug-2019 01:28	
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	10-Aug-2019 01:28	
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	10-Aug-2019 01:28	
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 01:28	
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 01:28	
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 01:28	
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	10-Aug-2019 01:28	
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 01:28	
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	10-Aug-2019 01:28	
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 01:28	
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Aug-2019 01:28	
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 01:28	
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Aug-2019 01:28	
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 01:28	
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	10-Aug-2019 01:28	
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 01:28	
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	10-Aug-2019 01:28	
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Aug-2019 01:28	
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 01:28	
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	10-Aug-2019 01:28	
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	10-Aug-2019 01:28	
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 01:28	
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Aug-2019 01:28	
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 01:28	
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 01:28	
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	10-Aug-2019 01:28	
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	10-Aug-2019 01:28	
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	10-Aug-2019 01:28	
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	10-Aug-2019 01:28	
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 01:28	
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 01:28	

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

ALS Houston, US

Date: 12-Aug-19

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 35BWW17-190807
 Collection Date: 07-Aug-2019 11:55

ANALYTICAL REPORT
 WorkOrder:HS19080443
 Lab ID:HS19080443-06
 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED	
VOLATILES ORGANICS BY METHOD 8260C		Method:SW8260							Analyst: AKP
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 01:28	
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 01:28	
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 01:28	
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	10-Aug-2019 01:28	
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 01:28	
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 01:28	
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 01:28	
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 01:28	
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	10-Aug-2019 01:28	
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 01:28	
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	10-Aug-2019 01:28	
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	10-Aug-2019 01:28	
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Aug-2019 01:28	
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 01:28	
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 01:28	
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 01:28	
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 01:28	
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 01:28	
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 01:28	
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 01:28	
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 01:28	
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 01:28	
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 01:28	
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 01:28	
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 01:28	
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 01:28	
Surr: 1,2-Dichloroethane-d4	89.2			0	81-118	%REC	1	10-Aug-2019 01:28	
Surr: 4-Bromofluorobenzene	100			0	85-114	%REC	1	10-Aug-2019 01:28	
Surr: Dibromofluoromethane	92.9			0	80-119	%REC	1	10-Aug-2019 01:28	
Surr: Toluene-d8	101			0	89-112	%REC	1	10-Aug-2019 01:28	

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

ALS Houston, US

Date: 12-Aug-19

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 35BWW15-190807
 Collection Date: 07-Aug-2019 12:45

ANALYTICAL REPORT
 WorkOrder:HS19080443
 Lab ID:HS19080443-07
 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED	
VOLATILES ORGANICS BY METHOD 8260C		Method:SW8260							Analyst: AKP
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 06:41	
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 06:41	
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	10-Aug-2019 06:41	
1,1,2-Trichlor-1,2,2-trifluoroethane	3.9		0.50	0.50	1.0	UG/L	1	10-Aug-2019 06:41	
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 06:41	
1,1-Dichloroethane	0.28	J	0.20	0.50	1.0	UG/L	1	10-Aug-2019 06:41	
1,1-Dichloroethene	1.1		0.20	0.50	1.0	UG/L	1	10-Aug-2019 06:41	
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 06:41	
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Aug-2019 06:41	
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	10-Aug-2019 06:41	
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	10-Aug-2019 06:41	
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 06:41	
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 06:41	
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 06:41	
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	10-Aug-2019 06:41	
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 06:41	
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	10-Aug-2019 06:41	
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 06:41	
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Aug-2019 06:41	
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 06:41	
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Aug-2019 06:41	
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 06:41	
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	10-Aug-2019 06:41	
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 06:41	
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	10-Aug-2019 06:41	
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Aug-2019 06:41	
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 06:41	
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	10-Aug-2019 06:41	
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	10-Aug-2019 06:41	
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 06:41	
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Aug-2019 06:41	
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 06:41	
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 06:41	
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	10-Aug-2019 06:41	
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	10-Aug-2019 06:41	
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	10-Aug-2019 06:41	
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	10-Aug-2019 06:41	
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 06:41	

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

ALS Houston, US

Date: 12-Aug-19

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 35BWW15-190807
 Collection Date: 07-Aug-2019 12:45

ANALYTICAL REPORT
 WorkOrder:HS19080443
 Lab ID:HS19080443-07
 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED	
VOLATILES ORGANICS BY METHOD 8260C		Method:SW8260							Analyst: AKP
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 06:41	
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 06:41	
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 06:41	
cis-1,2-Dichloroethene	0.39	J	0.20	0.50	1.0	UG/L	1	10-Aug-2019 06:41	
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	10-Aug-2019 06:41	
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 06:41	
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 06:41	
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 06:41	
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 06:41	
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	10-Aug-2019 06:41	
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 06:41	
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	10-Aug-2019 06:41	
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	10-Aug-2019 06:41	
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Aug-2019 06:41	
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 06:41	
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 06:41	
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 06:41	
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 06:41	
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 06:41	
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 06:41	
Tetrachloroethene	9.7		0.30	0.50	1.0	UG/L	1	10-Aug-2019 06:41	
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 06:41	
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 06:41	
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 06:41	
Trichloroethene	7.6		0.20	0.50	1.0	UG/L	1	10-Aug-2019 06:41	
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 06:41	
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 06:41	
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>88.9</i>			0	<i>81-118</i>	<i>%REC</i>	1	<i>10-Aug-2019 06:41</i>	
<i>Surr: 4-Bromofluorobenzene</i>	<i>100</i>			0	<i>85-114</i>	<i>%REC</i>	1	<i>10-Aug-2019 06:41</i>	
<i>Surr: Dibromofluoromethane</i>	<i>92.2</i>			0	<i>80-119</i>	<i>%REC</i>	1	<i>10-Aug-2019 06:41</i>	
<i>Surr: Toluene-d8</i>	<i>102</i>			0	<i>89-112</i>	<i>%REC</i>	1	<i>10-Aug-2019 06:41</i>	

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

ALS Houston, US

Date: 12-Aug-19

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: Trip Blank
 Collection Date: 07-Aug-2019 00:00

ANALYTICAL REPORT
 WorkOrder:HS19080443
 Lab ID:HS19080443-08
 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED	
VOLATILES ORGANICS BY METHOD 8260C		Method:SW8260							Analyst: AKP
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 00:40	
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 00:40	
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	10-Aug-2019 00:40	
1,1,2-Trichlor-1,2,2-trifluoroethane	0.50	U	0.50	0.50	1.0	UG/L	1	10-Aug-2019 00:40	
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 00:40	
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 00:40	
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 00:40	
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 00:40	
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Aug-2019 00:40	
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	10-Aug-2019 00:40	
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	10-Aug-2019 00:40	
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 00:40	
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 00:40	
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 00:40	
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	10-Aug-2019 00:40	
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 00:40	
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	10-Aug-2019 00:40	
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 00:40	
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Aug-2019 00:40	
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 00:40	
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Aug-2019 00:40	
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 00:40	
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	10-Aug-2019 00:40	
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 00:40	
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	10-Aug-2019 00:40	
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Aug-2019 00:40	
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 00:40	
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	10-Aug-2019 00:40	
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	10-Aug-2019 00:40	
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 00:40	
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Aug-2019 00:40	
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 00:40	
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 00:40	
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	10-Aug-2019 00:40	
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	10-Aug-2019 00:40	
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	10-Aug-2019 00:40	
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	10-Aug-2019 00:40	
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 00:40	
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 00:40	

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

ALS Houston, US

Date: 12-Aug-19

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: Trip Blank
 Collection Date: 07-Aug-2019 00:00

ANALYTICAL REPORT

WorkOrder:HS19080443
 Lab ID:HS19080443-08
 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED	
VOLATILES ORGANICS BY METHOD 8260C		Method:SW8260							Analyst: AKP
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 00:40	
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 00:40	
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 00:40	
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	10-Aug-2019 00:40	
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 00:40	
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 00:40	
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 00:40	
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 00:40	
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	10-Aug-2019 00:40	
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 00:40	
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	10-Aug-2019 00:40	
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	10-Aug-2019 00:40	
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Aug-2019 00:40	
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 00:40	
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 00:40	
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 00:40	
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 00:40	
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 00:40	
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 00:40	
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 00:40	
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 00:40	
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 00:40	
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 00:40	
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 00:40	
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Aug-2019 00:40	
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	10-Aug-2019 00:40	
Surr: 1,2-Dichloroethane-d4	88.6			0	81-118	%REC	1	10-Aug-2019 00:40	
Surr: 4-Bromofluorobenzene	101			0	85-114	%REC	1	10-Aug-2019 00:40	
Surr: Dibromofluoromethane	92.1			0	80-119	%REC	1	10-Aug-2019 00:40	
Surr: Toluene-d8	103			0	89-112	%REC	1	10-Aug-2019 00:40	

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

ALS Houston, US

Date: 12-ago-19

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS19080443

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID: R344032 (0)		Test Name : VOLATILES ORGANICS BY METHOD 8260C			Matrix: Water	
HS19080443-01	35BWW11-190807	07 Aug 2019 08:00			10 Aug 2019 05:04	1
HS19080443-02	LHSMW58-190807	07 Aug 2019 08:45			10 Aug 2019 01:04	1
HS19080443-03	35BWW24-190807	07 Aug 2019 09:35			10 Aug 2019 05:28	1
HS19080443-04	35BWW25-190807	07 Aug 2019 10:20			10 Aug 2019 05:52	1
HS19080443-05	35BWW16-190807	07 Aug 2019 11:05			10 Aug 2019 06:17	1
HS19080443-06	35BWW17-190807	07 Aug 2019 11:55			10 Aug 2019 01:28	1
HS19080443-07	35BWW15-190807	07 Aug 2019 12:45			10 Aug 2019 06:41	1
HS19080443-08	Trip Blank	07 Aug 2019 00:00			10 Aug 2019 00:40	1

ALS Houston, US

Date: 12-Aug-19

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS19080443

QC BATCH REPORT

Batch ID: R344032 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MBLK	Sample ID: VBLKW-190809	Units: UG/L			Analysis Date: 09-Aug-2019 23:04					
Client ID:	Run ID: VOA6_344032	SeqNo: 5204476	PrepDate:	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromomethane	0.50	1.0								U
Carbon disulfide	1.0	2.0								U
Carbon tetrachloride	0.50	1.0								U
Chlorobenzene	0.50	1.0								U
Chloroethane	0.50	1.0								U
Chloroform	0.50	1.0								U
Chloromethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
cis-1,3-Dichloropropene	0.50	1.0								U
Dibromochloromethane	0.50	1.0								U
Dibromomethane	0.50	1.0								U
Dichlorodifluoromethane	0.50	1.0								U
Ethylbenzene	0.50	1.0								U
Hexachlorobutadiene	1.0	1.0								U
Isopropylbenzene	0.50	1.0								U
m,p-Xylene	1.0	2.0								U
Methylene chloride	1.0	2.0								U
Naphthalene	0.50	1.0								U
n-Butylbenzene	0.50	1.0								U
n-Propylbenzene	0.50	1.0								U
o-Xylene	0.50	1.0								U
sec-Butylbenzene	0.50	1.0								U
Styrene	0.50	1.0								U
tert-Butylbenzene	0.50	1.0								U
Tetrachloroethene	0.50	1.0								U
Toluene	0.50	1.0								U
trans-1,2-Dichloroethene	0.50	1.0								U
trans-1,3-Dichloropropene	0.50	1.0								U
Trichloroethene	0.50	1.0								U
Trichlorofluoromethane	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>45.02</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>90.0</i>	<i>81 - 118</i>				
<i>Surr: 4-Bromofluorobenzene</i>	<i>50.47</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>101</i>	<i>85 - 114</i>				
<i>Surr: Dibromofluoromethane</i>	<i>46.39</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>92.8</i>	<i>80 - 119</i>				

ALS Houston, US

Date: 12-Aug-19

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS19080443

QC BATCH REPORT

Batch ID: R344032 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MBLK	Sample ID: VBLKW-190809	Units: UG/L			Analysis Date: 09-Aug-2019 23:04					
Client ID:	Run ID: VOA6_344032	SeqNo: 5204476		PrepDate:		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
<i>Surr: Toluene-d8</i>	51.92	1.0	50	0	104	89 - 112				

ALS Houston, US

Date: 12-Aug-19

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS19080443

QC BATCH REPORT

Batch ID: R344032 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
LCS	Sample ID: VLCSW-190809	Units: UG/L			Analysis Date: 09-Aug-2019 22:15					
Client ID:	Run ID: VOA6_344032	SeqNo: 5204475		PrepDate:		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	20.52	1.0	20	0	103	78 - 124				
1,1,1-Trichloroethane	20.89	1.0	20	0	104	74 - 131				
1,1,2,2-Tetrachloroethane	21.17	1.0	20	0	106	71 - 121				
1,1,2-Trichlor-1,2,2-trifluoroethane	23.09	1.0	20	0	115	70 - 136				
1,1,2-Trichloroethane	20.29	1.0	20	0	101	80 - 119				
1,1-Dichloroethane	20.21	1.0	20	0	101	77 - 125				
1,1-Dichloroethene	21.15	1.0	20	0	106	71 - 131				
1,1-Dichloropropene	20.73	1.0	20	0	104	78 - 125				
1,2,3-Trichlorobenzene	23.36	1.0	20	0	117	69 - 129				
1,2,3-Trichloropropane	20.51	1.0	20	0	103	73 - 122				
1,2,4-Trichlorobenzene	22.17	1.0	20	0	111	69 - 130				
1,2,4-Trimethylbenzene	21.43	1.0	20	0	107	76 - 124				
1,2-Dibromo-3-chloropropane	20.24	1.0	20	0	101	62 - 128				
1,2-Dibromoethane	20.43	1.0	20	0	102	77 - 121				
1,2-Dichlorobenzene	21.56	1.0	20	0	108	80 - 119				
1,2-Dichloroethane	19.54	1.0	20	0	97.7	73 - 128				
1,2-Dichloropropane	21.14	1.0	20	0	106	78 - 122				
1,3,5-Trimethylbenzene	21.65	1.0	20	0	108	75 - 124				
1,3-Dichlorobenzene	20.64	1.0	20	0	103	80 - 119				
1,3-Dichloropropane	20.17	1.0	20	0	101	80 - 119				
1,4-Dichlorobenzene	21.76	1.0	20	0	109	79 - 118				
2,2-Dichloropropane	19.11	1.0	20	0	95.5	60 - 139				
2-Butanone	36.47	2.0	40	0	91.2	56 - 143				
2-Chlorotoluene	20.94	1.0	20	0	105	79 - 122				
2-Hexanone	40.55	2.0	40	0	101	57 - 139				
4-Chlorotoluene	20.83	1.0	20	0	104	78 - 122				
4-Isopropyltoluene	22.19	1.0	20	0	111	77 - 127				
4-Methyl-2-pentanone	39.49	2.0	40	0	98.7	67 - 130				
Acetone	32.53	2.0	40	0	81.3	39 - 160				
Benzene	20.82	1.0	20	0	104	79 - 120				
Bromobenzene	20.4	1.0	20	0	102	80 - 120				
Bromochloromethane	19.31	1.0	20	0	96.6	78 - 123				
Bromodichloromethane	20.17	1.0	20	0	101	79 - 125				
Bromoform	19.73	1.0	20	0	98.7	66 - 130				

ALS Houston, US

Date: 12-Aug-19

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS19080443

QC BATCH REPORT

Batch ID: R344032 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
LCS	Sample ID: VLCSW-190809	Units: UG/L			Analysis Date: 09-Aug-2019 22:15					
Client ID:	Run ID: VOA6_344032	SeqNo: 5204475	PrepDate:	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromomethane	24.36	1.0	20	0	122	53 - 141				
Carbon disulfide	42.97	2.0	40	0	107	64 - 133				
Carbon tetrachloride	20.35	1.0	20	0	102	72 - 136				
Chlorobenzene	20.55	1.0	20	0	103	82 - 118				
Chloroethane	22.73	1.0	20	0	114	60 - 138				
Chloroform	20.27	1.0	20	0	101	79 - 124				
Chloromethane	21.92	1.0	20	0	110	50 - 139				
cis-1,2-Dichloroethene	19.87	1.0	20	0	99.4	78 - 123				
cis-1,3-Dichloropropene	20.31	1.0	20	0	102	75 - 124				
Dibromochloromethane	20.25	1.0	20	0	101	74 - 126				
Dibromomethane	20.31	1.0	20	0	102	79 - 123				
Dichlorodifluoromethane	20.6	1.0	20	0	103	32 - 152				
Ethylbenzene	21.31	1.0	20	0	107	79 - 121				
Hexachlorobutadiene	26.02	1.0	20	0	130	66 - 134				
Isopropylbenzene	21.62	1.0	20	0	108	72 - 131				
m,p-Xylene	42.34	2.0	40	0	106	80 - 121				
Methylene chloride	21.7	2.0	20	0	108	74 - 124				
Naphthalene	21.25	1.0	20	0	106	61 - 128				
n-Butylbenzene	22.67	1.0	20	0	113	75 - 128				
n-Propylbenzene	21.66	1.0	20	0	108	76 - 126				
o-Xylene	21.02	1.0	20	0	105	78 - 122				
sec-Butylbenzene	22.34	1.0	20	0	112	77 - 126				
Styrene	21.15	1.0	20	0	106	78 - 123				
tert-Butylbenzene	21.9	1.0	20	0	110	78 - 124				
Tetrachloroethene	21.08	1.0	20	0	105	74 - 129				
Toluene	20.98	1.0	20	0	105	80 - 121				
trans-1,2-Dichloroethene	20.55	1.0	20	0	103	75 - 124				
trans-1,3-Dichloropropene	20.33	1.0	20	0	102	73 - 127				
Trichloroethene	20.83	1.0	20	0	104	79 - 123				
Trichlorofluoromethane	21.48	1.0	20	0	107	65 - 141				
Vinyl chloride	21.66	1.0	20	0	108	58 - 137				
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>49.49</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>99.0</i>	<i>81 - 118</i>				
<i>Surr: 4-Bromofluorobenzene</i>	<i>51.41</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>103</i>	<i>85 - 114</i>				
<i>Surr: Dibromofluoromethane</i>	<i>49.94</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>99.9</i>	<i>80 - 119</i>				

ALS Houston, US

Date: 12-Aug-19

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS19080443

QC BATCH REPORT

Batch ID: R344032 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
LCS	Sample ID: VLCSW-190809	Units: UG/L			Analysis Date: 09-Aug-2019 22:15					
Client ID:	Run ID: VOA6_344032	SeqNo: 5204475		PrepDate:		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
<i>Surr: Toluene-d8</i>	47.97	1.0	50	0	95.9	89 - 112				

ALS Houston, US

Date: 12-Aug-19

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS19080443

QC BATCH REPORT

Batch ID: R344032 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MS	Sample ID: HS19080443-06MS	Units: UG/L			Analysis Date: 10-Aug-2019 02:40					
Client ID: 35BWW17-190807	Run ID: VOA6_344032	SeqNo: 5204485	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	16.7	1.0	20	0	83.5	78 - 124				
1,1,1-Trichloroethane	15.51	1.0	20	0	77.6	74 - 131				
1,1,2,2-Tetrachloroethane	17	1.0	20	0	85.0	71 - 121				
1,1,2-Trichlor-1,2,2-trifluoroethane	17.2	1.0	20	0	86.0	70 - 136				
1,1,2-Trichloroethane	15.98	1.0	20	0	79.9	80 - 119				S
1,1-Dichloroethane	14.67	1.0	20	0	73.4	77 - 125				S
1,1-Dichloroethene	14.96	1.0	20	0	74.8	71 - 131				
1,1-Dichloropropene	15.97	1.0	20	0	79.8	78 - 125				
1,2,3-Trichlorobenzene	16.59	1.0	20	0	83.0	69 - 129				
1,2,3-Trichloropropane	23.75	1.0	20	0	119	73 - 122				
1,2,4-Trichlorobenzene	17.01	1.0	20	0	85.1	69 - 130				
1,2,4-Trimethylbenzene	17.66	1.0	20	0	88.3	76 - 124				
1,2-Dibromo-3-chloropropane	15.59	1.0	20	0	78.0	62 - 128				
1,2-Dibromoethane	15.79	1.0	20	0	79.0	77 - 121				
1,2-Dichlorobenzene	18.04	1.0	20	0	90.2	80 - 119				
1,2-Dichloroethane	14.85	1.0	20	0	74.3	73 - 128				
1,2-Dichloropropane	16	1.0	20	0	80.0	78 - 122				
1,3,5-Trimethylbenzene	18.1	1.0	20	0	90.5	75 - 124				
1,3-Dichlorobenzene	17.22	1.0	20	0	86.1	80 - 119				
1,3-Dichloropropane	15.92	1.0	20	0	79.6	80 - 119				S
1,4-Dichlorobenzene	18.12	1.0	20	0	90.6	79 - 118				
2,2-Dichloropropane	12.79	1.0	20	0	63.9	60 - 139				
2-Butanone	34.65	2.0	40	0	86.6	56 - 143				
2-Chlorotoluene	17.62	1.0	20	0	88.1	79 - 122				
2-Hexanone	43.8	2.0	40	0	109	57 - 139				
4-Chlorotoluene	17.45	1.0	20	0	87.2	78 - 122				
4-Isopropyltoluene	18.31	1.0	20	0	91.6	77 - 127				
4-Methyl-2-pentanone	43.51	2.0	40	0	109	67 - 130				
Acetone	27	2.0	40	0	67.5	39 - 160				
Benzene	15.86	1.0	20	0	79.3	79 - 120				
Bromobenzene	16.8	1.0	20	0	84.0	80 - 120				
Bromochloromethane	14.06	1.0	20	0	70.3	78 - 123				S
Bromodichloromethane	15.3	1.0	20	0	76.5	79 - 125				S
Bromoform	15.37	1.0	20	0	76.8	66 - 130				

ALS Houston, US

Date: 12-Aug-19

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS19080443

QC BATCH REPORT

Batch ID: R344032 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MS	Sample ID: HS19080443-06MS	Units: UG/L			Analysis Date: 10-Aug-2019 02:40					
Client ID: 35BWW17-190807	Run ID: VOA6_344032	SeqNo: 5204485	PrepDate:	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromomethane	15.25	1.0	20	0	76.3	53 - 141				
Carbon disulfide	42.19	2.0	40	0	105	64 - 133				
Carbon tetrachloride	16.03	1.0	20	0	80.2	72 - 136				
Chlorobenzene	16.6	1.0	20	0	83.0	82 - 118				
Chloroethane	14.84	1.0	20	0	74.2	60 - 138				
Chloroform	14.73	1.0	20	0	73.6	79 - 124				S
Chloromethane	11.41	1.0	20	0	57.0	50 - 139				
cis-1,2-Dichloroethene	14.47	1.0	20	0	72.4	78 - 123				S
cis-1,3-Dichloropropene	15.04	1.0	20	0	75.2	75 - 124				
Dibromochloromethane	15.95	1.0	20	0	79.7	74 - 126				
Dibromomethane	15.18	1.0	20	0	75.9	79 - 123				S
Dichlorodifluoromethane	8.24	1.0	20	0	41.2	32 - 152				
Ethylbenzene	17.56	1.0	20	0	87.8	79 - 121				
Hexachlorobutadiene	19.66	1.0	20	0	98.3	66 - 134				
Isopropylbenzene	17.76	1.0	20	0	88.8	72 - 131				
m,p-Xylene	34.46	2.0	40	0	86.1	80 - 121				
Methylene chloride	14.82	2.0	20	0	74.1	74 - 124				
Naphthalene	14.34	1.0	20	0	71.7	61 - 128				
n-Butylbenzene	18.55	1.0	20	0	92.8	75 - 128				
n-Propylbenzene	18.51	1.0	20	0	92.6	76 - 126				
o-Xylene	17.05	1.0	20	0	85.2	78 - 122				
sec-Butylbenzene	18.8	1.0	20	0	94.0	77 - 126				
Styrene	16.9	1.0	20	0	84.5	78 - 123				
tert-Butylbenzene	18.59	1.0	20	0	93.0	78 - 124				
Tetrachloroethene	17.42	1.0	20	0	87.1	74 - 129				
Toluene	17.11	1.0	20	0	85.6	80 - 121				
trans-1,2-Dichloroethene	14.48	1.0	20	0	72.4	75 - 124				S
trans-1,3-Dichloropropene	14.6	1.0	20	0	73.0	73 - 127				
Trichloroethene	16.04	1.0	20	0	80.2	79 - 123				
Trichlorofluoromethane	14.69	1.0	20	0	73.5	65 - 141				
Vinyl chloride	12.69	1.0	20	0	63.5	58 - 137				
Surr: 1,2-Dichloroethane-d4	45.22	1.0	50	0	90.4	81 - 118				
Surr: 4-Bromofluorobenzene	50.15	1.0	50	0	100	85 - 114				
Surr: Dibromofluoromethane	46.42	1.0	50	0	92.8	80 - 119				

ALS Houston, US

Date: 12-Aug-19

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS19080443

QC BATCH REPORT

Batch ID: R344032 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MS	Sample ID: HS19080443-06MS	Units: UG/L			Analysis Date: 10-Aug-2019 02:40					
Client ID: 35BWW17-190807	Run ID: VOA6_344032	SeqNo: 5204485		PrepDate:		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
<i>Surr: Toluene-d8</i>	50.8	1.0	50	0	102	89 - 112				

ALS Houston, US

Date: 12-Aug-19

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS19080443

QC BATCH REPORT

Batch ID: R344032 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MS	Sample ID: HS19080443-02MS	Units: UG/L			Analysis Date: 10-Aug-2019 01:52					
Client ID: LHSMW58-190807	Run ID: VOA6_344032	SeqNo: 5204483	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	15.79	1.0	20	0	78.9	78 - 124				
1,1,1-Trichloroethane	14.9	1.0	20	0	74.5	74 - 131				
1,1,2,2-Tetrachloroethane	15.8	1.0	20	0	79.0	71 - 121				
1,1,2-Trichlor-1,2,2-trifluoroethane	17.22	1.0	20	1.727	77.5	70 - 136				
1,1,2-Trichloroethane	15.43	1.0	20	0	77.1	80 - 119				S
1,1-Dichloroethane	14.09	1.0	20	0	70.4	77 - 125				S
1,1-Dichloroethene	14.54	1.0	20	0	72.7	71 - 131				
1,1-Dichloropropene	15.39	1.0	20	0	77.0	78 - 125				S
1,2,3-Trichlorobenzene	15.28	1.0	20	0	76.4	69 - 129				
1,2,3-Trichloropropane	22.77	1.0	20	0	114	73 - 122				
1,2,4-Trichlorobenzene	15.97	1.0	20	0	79.9	69 - 130				
1,2,4-Trimethylbenzene	16.62	1.0	20	0	83.1	76 - 124				
1,2-Dibromo-3-chloropropane	14.78	1.0	20	0	73.9	62 - 128				
1,2-Dibromoethane	15.23	1.0	20	0	76.1	77 - 121				S
1,2-Dichlorobenzene	16.91	1.0	20	0	84.6	80 - 119				
1,2-Dichloroethane	14.24	1.0	20	0	71.2	73 - 128				S
1,2-Dichloropropane	15.4	1.0	20	0	77.0	78 - 122				S
1,3,5-Trimethylbenzene	17.01	1.0	20	0	85.1	75 - 124				
1,3-Dichlorobenzene	16.07	1.0	20	0	80.3	80 - 119				
1,3-Dichloropropane	15.27	1.0	20	0	76.4	80 - 119				S
1,4-Dichlorobenzene	16.84	1.0	20	0	84.2	79 - 118				
2,2-Dichloropropane	12.59	1.0	20	0	63.0	60 - 139				
2-Butanone	33.38	2.0	40	0	83.4	56 - 143				
2-Chlorotoluene	16.35	1.0	20	0	81.8	79 - 122				
2-Hexanone	41.86	2.0	40	0	105	57 - 139				
4-Chlorotoluene	16.25	1.0	20	0	81.2	78 - 122				
4-Isopropyltoluene	17.21	1.0	20	0	86.0	77 - 127				
4-Methyl-2-pentanone	41.98	2.0	40	0	105	67 - 130				
Acetone	26.96	2.0	40	0	67.4	39 - 160				
Benzene	15.37	1.0	20	0	76.8	79 - 120				S
Bromobenzene	15.83	1.0	20	0	79.1	80 - 120				S
Bromochloromethane	13.59	1.0	20	0	68.0	78 - 123				S
Bromodichloromethane	14.7	1.0	20	0	73.5	79 - 125				S
Bromoform	14.56	1.0	20	0	72.8	66 - 130				

ALS Houston, US

Date: 12-Aug-19

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS19080443

QC BATCH REPORT

Batch ID: R344032 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MS	Sample ID: HS19080443-02MS	Units: UG/L			Analysis Date: 10-Aug-2019 01:52					
Client ID: LHSMW58-190807	Run ID: VOA6_344032	SeqNo: 5204483	PrepDate:	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromomethane	16.62	1.0	20	0	83.1	53 - 141				
Carbon disulfide	41.47	2.0	40	0	104	64 - 133				
Carbon tetrachloride	15.42	1.0	20	0	77.1	72 - 136				
Chlorobenzene	15.86	1.0	20	0	79.3	82 - 118				S
Chloroethane	14.57	1.0	20	0	72.9	60 - 138				
Chloroform	14.25	1.0	20	0	71.2	79 - 124				S
Chloromethane	11.09	1.0	20	0	55.5	50 - 139				
cis-1,2-Dichloroethene	14.26	1.0	20	0	71.3	78 - 123				S
cis-1,3-Dichloropropene	14.32	1.0	20	0	71.6	75 - 124				S
Dibromochloromethane	15.06	1.0	20	0	75.3	74 - 126				
Dibromomethane	14.32	1.0	20	0	71.6	79 - 123				S
Dichlorodifluoromethane	8.367	1.0	20	0	41.8	32 - 152				
Ethylbenzene	16.48	1.0	20	0	82.4	79 - 121				
Hexachlorobutadiene	18.63	1.0	20	0	93.1	66 - 134				
Isopropylbenzene	16.89	1.0	20	0	84.5	72 - 131				
m,p-Xylene	32.74	2.0	40	0	81.9	80 - 121				
Methylene chloride	14.62	2.0	20	0	73.1	74 - 124				S
Naphthalene	13.37	1.0	20	0	66.8	61 - 128				
n-Butylbenzene	17.45	1.0	20	0	87.2	75 - 128				
n-Propylbenzene	17.2	1.0	20	0	86.0	76 - 126				
o-Xylene	16.25	1.0	20	0	81.2	78 - 122				
sec-Butylbenzene	17.55	1.0	20	0	87.8	77 - 126				
Styrene	16.07	1.0	20	0	80.4	78 - 123				
tert-Butylbenzene	17.5	1.0	20	0	87.5	78 - 124				
Tetrachloroethene	23.4	1.0	20	6.846	82.8	74 - 129				
Toluene	16.25	1.0	20	0	81.2	80 - 121				
trans-1,2-Dichloroethene	14.43	1.0	20	0	72.2	75 - 124				S
trans-1,3-Dichloropropene	13.78	1.0	20	0	68.9	73 - 127				S
Trichloroethene	16.14	1.0	20	0.5885	77.8	79 - 123				S
Trichlorofluoromethane	14.48	1.0	20	0	72.4	65 - 141				
Vinyl chloride	12.55	1.0	20	0	62.7	58 - 137				
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>45.39</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>90.8</i>	<i>81 - 118</i>				
<i>Surr: 4-Bromofluorobenzene</i>	<i>50.08</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>100</i>	<i>85 - 114</i>				
<i>Surr: Dibromofluoromethane</i>	<i>46.42</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>92.8</i>	<i>80 - 119</i>				

ALS Houston, US

Date: 12-Aug-19

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS19080443

QC BATCH REPORT

Batch ID: R344032 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MS	Sample ID: HS19080443-02MS	Units: UG/L			Analysis Date: 10-Aug-2019 01:52					
Client ID: LHSMW58-190807	Run ID: VOA6_344032	SeqNo: 5204483		PrepDate:		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
<i>Surr: Toluene-d8</i>	49.93	1.0	50	0	99.9	89 - 112				

ALS Houston, US

Date: 12-Aug-19

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS19080443

QC BATCH REPORT

Batch ID: R344032 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MSD	Sample ID: HS19080443-06MSD	Units: UG/L			Analysis Date: 10-Aug-2019 03:04					
Client ID: 35BWW17-190807	Run ID: VOA6_344032	SeqNo: 5204486	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	15.89	1.0	20	0	79.5	78 - 124	16.7	4.99	20	
1,1,1-Trichloroethane	14.48	1.0	20	0	72.4	74 - 131	15.51	6.91	20	S
1,1,2,2-Tetrachloroethane	16.53	1.0	20	0	82.7	71 - 121	17	2.75	20	
1,1,2-Trichlor-1,2,2-trifluoroethane	16.14	1.0	20	0	80.7	70 - 136	17.2	6.34	20	
1,1,2-Trichloroethane	15.8	1.0	20	0	79.0	80 - 119	15.98	1.13	20	S
1,1-Dichloroethane	13.87	1.0	20	0	69.3	77 - 125	14.67	5.63	20	S
1,1-Dichloroethene	14	1.0	20	0	70.0	71 - 131	14.96	6.68	20	S
1,1-Dichloropropene	15.07	1.0	20	0	75.4	78 - 125	15.97	5.77	20	S
1,2,3-Trichlorobenzene	15.99	1.0	20	0	80.0	69 - 129	16.59	3.68	20	
1,2,3-Trichloropropane	23.3	1.0	20	0	116	73 - 122	23.75	1.93	20	
1,2,4-Trichlorobenzene	16.19	1.0	20	0	81.0	69 - 130	17.01	4.95	20	
1,2,4-Trimethylbenzene	16.48	1.0	20	0	82.4	76 - 124	17.66	6.92	20	
1,2-Dibromo-3-chloropropane	15.68	1.0	20	0	78.4	62 - 128	15.59	0.573	20	
1,2-Dibromoethane	15.55	1.0	20	0	77.7	77 - 121	15.79	1.57	20	
1,2-Dichlorobenzene	16.93	1.0	20	0	84.7	80 - 119	18.04	6.36	20	
1,2-Dichloroethane	14.54	1.0	20	0	72.7	73 - 128	14.85	2.14	20	S
1,2-Dichloropropane	15.5	1.0	20	0	77.5	78 - 122	16	3.19	20	S
1,3,5-Trimethylbenzene	16.69	1.0	20	0	83.5	75 - 124	18.1	8.09	20	
1,3-Dichlorobenzene	16.06	1.0	20	0	80.3	80 - 119	17.22	6.96	20	
1,3-Dichloropropane	15.56	1.0	20	0	77.8	80 - 119	15.92	2.28	20	S
1,4-Dichlorobenzene	17.01	1.0	20	0	85.1	79 - 118	18.12	6.32	20	
2,2-Dichloropropane	12.02	1.0	20	0	60.1	60 - 139	12.79	6.19	20	
2-Butanone	34.29	2.0	40	0	85.7	56 - 143	34.65	1.03	20	
2-Chlorotoluene	16.5	1.0	20	0	82.5	79 - 122	17.62	6.54	20	
2-Hexanone	43.35	2.0	40	0	108	57 - 139	43.8	1.03	20	
4-Chlorotoluene	16.14	1.0	20	0	80.7	78 - 122	17.45	7.76	20	
4-Isopropyltoluene	16.99	1.0	20	0	84.9	77 - 127	18.31	7.51	20	
4-Methyl-2-pentanone	43.26	2.0	40	0	108	67 - 130	43.51	0.578	20	
Acetone	27.03	2.0	40	0	67.6	39 - 160	27	0.0883	20	
Benzene	15.12	1.0	20	0	75.6	79 - 120	15.86	4.77	20	S
Bromobenzene	16.14	1.0	20	0	80.7	80 - 120	16.8	4.01	20	
Bromochloromethane	13.66	1.0	20	0	68.3	78 - 123	14.06	2.93	20	S
Bromodichloromethane	14.9	1.0	20	0	74.5	79 - 125	15.3	2.64	20	S
Bromoform	15.02	1.0	20	0	75.1	66 - 130	15.37	2.27	20	

ALS Houston, US

Date: 12-Aug-19

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS19080443

QC BATCH REPORT

Batch ID: R344032 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MSD	Sample ID: HS19080443-06MSD	Units: UG/L			Analysis Date: 10-Aug-2019 03:04					
Client ID: 35BWW17-190807	Run ID: VOA6_344032	SeqNo: 5204486	PrepDate:	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromomethane	14.53	1.0	20	0	72.6	53 - 141	15.25	4.88	20	
Carbon disulfide	39.53	2.0	40	0	98.8	64 - 133	42.19	6.52	20	
Carbon tetrachloride	15.19	1.0	20	0	75.9	72 - 136	16.03	5.4	20	
Chlorobenzene	15.9	1.0	20	0	79.5	82 - 118	16.6	4.31	20	S
Chloroethane	13.97	1.0	20	0	69.8	60 - 138	14.84	6.07	20	
Chloroform	14.13	1.0	20	0	70.7	79 - 124	14.73	4.12	20	S
Chloromethane	10.62	1.0	20	0	53.1	50 - 139	11.41	7.13	20	
cis-1,2-Dichloroethene	13.79	1.0	20	0	68.9	78 - 123	14.47	4.85	20	S
cis-1,3-Dichloropropene	14.58	1.0	20	0	72.9	75 - 124	15.04	3.08	20	S
Dibromochloromethane	15.36	1.0	20	0	76.8	74 - 126	15.95	3.75	20	
Dibromomethane	14.69	1.0	20	0	73.5	79 - 123	15.18	3.26	20	S
Dichlorodifluoromethane	7.925	1.0	20	0	39.6	32 - 152	8.24	3.9	20	
Ethylbenzene	16.4	1.0	20	0	82.0	79 - 121	17.56	6.86	20	
Hexachlorobutadiene	18.26	1.0	20	0	91.3	66 - 134	19.66	7.35	20	
Isopropylbenzene	16.68	1.0	20	0	83.4	72 - 131	17.76	6.3	20	
m,p-Xylene	32.16	2.0	40	0	80.4	80 - 121	34.46	6.91	20	
Methylene chloride	14.19	2.0	20	0	71.0	74 - 124	14.82	4.29	20	S
Naphthalene	13.7	1.0	20	0	68.5	61 - 128	14.34	4.58	20	
n-Butylbenzene	17.19	1.0	20	0	85.9	75 - 128	18.55	7.63	20	
n-Propylbenzene	17.04	1.0	20	0	85.2	76 - 126	18.51	8.28	20	
o-Xylene	16.34	1.0	20	0	81.7	78 - 122	17.05	4.25	20	
sec-Butylbenzene	17.26	1.0	20	0	86.3	77 - 126	18.8	8.52	20	
Styrene	15.96	1.0	20	0	79.8	78 - 123	16.9	5.73	20	
tert-Butylbenzene	17.35	1.0	20	0	86.8	78 - 124	18.59	6.89	20	
Tetrachloroethene	16.22	1.0	20	0	81.1	74 - 129	17.42	7.11	20	
Toluene	16.17	1.0	20	0	80.8	80 - 121	17.11	5.7	20	
trans-1,2-Dichloroethene	14.02	1.0	20	0	70.1	75 - 124	14.48	3.23	20	S
trans-1,3-Dichloropropene	14.41	1.0	20	0	72.1	73 - 127	14.6	1.31	20	S
Trichloroethene	15.29	1.0	20	0	76.4	79 - 123	16.04	4.78	20	S
Trichlorofluoromethane	13.85	1.0	20	0	69.2	65 - 141	14.69	5.9	20	
Vinyl chloride	11.99	1.0	20	0	60.0	58 - 137	12.69	5.67	20	
Surr: 1,2-Dichloroethane-d4	45.37	1.0	50	0	90.7	81 - 118	45.22	0.338	20	
Surr: 4-Bromofluorobenzene	50.22	1.0	50	0	100	85 - 114	50.15	0.144	20	
Surr: Dibromofluoromethane	46.3	1.0	50	0	92.6	80 - 119	46.42	0.248	20	

ALS Houston, US

Date: 12-Aug-19

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS19080443

QC BATCH REPORT

Batch ID: R344032 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MSD	Sample ID: HS19080443-06MSD	Units: UG/L			Analysis Date: 10-Aug-2019 03:04					
Client ID: 35BWW17-190807	Run ID: VOA6_344032	SeqNo: 5204486		PrepDate:		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
<i>Surr: Toluene-d8</i>	50.44	1.0	50	0	101	89 - 112	50.8	0.709	20	

ALS Houston, US

Date: 12-Aug-19

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS19080443

QC BATCH REPORT

Batch ID: R344032 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C							
MSD	Sample ID: HS19080443-02MSD	Units: UG/L			Analysis Date: 10-Aug-2019 02:16						
Client ID: LHSMW58-190807	Run ID: VOA6_344032	SeqNo: 5204484	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	15.45	1.0	20	0	77.3	78 - 124	15.79	2.14	20	S	
1,1,1-Trichloroethane	14.42	1.0	20	0	72.1	74 - 131	14.9	3.22	20	S	
1,1,2,2-Tetrachloroethane	15.63	1.0	20	0	78.1	71 - 121	15.8	1.12	20		
1,1,2-Trichlor-1,2,2-trifluoroethane	16.25	1.0	20	1.727	72.6	70 - 136	17.22	5.8	20		
1,1,2-Trichloroethane	15.11	1.0	20	0	75.5	80 - 119	15.43	2.08	20	S	
1,1-Dichloroethane	13.58	1.0	20	0	67.9	77 - 125	14.09	3.63	20	S	
1,1-Dichloroethene	13.8	1.0	20	0	69.0	71 - 131	14.54	5.2	20	S	
1,1-Dichloropropene	14.89	1.0	20	0	74.4	78 - 125	15.39	3.32	20	S	
1,2,3-Trichlorobenzene	15.44	1.0	20	0	77.2	69 - 129	15.28	1.01	20		
1,2,3-Trichloropropane	22.11	1.0	20	0	111	73 - 122	22.77	2.94	20		
1,2,4-Trichlorobenzene	15.51	1.0	20	0	77.5	69 - 130	15.97	2.97	20		
1,2,4-Trimethylbenzene	16.04	1.0	20	0	80.2	76 - 124	16.62	3.58	20		
1,2-Dibromo-3-chloropropane	14.48	1.0	20	0	72.4	62 - 128	14.78	2.02	20		
1,2-Dibromoethane	14.85	1.0	20	0	74.2	77 - 121	15.23	2.55	20	S	
1,2-Dichlorobenzene	16.5	1.0	20	0	82.5	80 - 119	16.91	2.49	20		
1,2-Dichloroethane	14.21	1.0	20	0	71.1	73 - 128	14.24	0.21	20	S	
1,2-Dichloropropane	15.05	1.0	20	0	75.2	78 - 122	15.4	2.34	20	S	
1,3,5-Trimethylbenzene	16.37	1.0	20	0	81.8	75 - 124	17.01	3.85	20		
1,3-Dichlorobenzene	15.56	1.0	20	0	77.8	80 - 119	16.07	3.22	20	S	
1,3-Dichloropropane	15.05	1.0	20	0	75.3	80 - 119	15.27	1.48	20	S	
1,4-Dichlorobenzene	16.43	1.0	20	0	82.1	79 - 118	16.84	2.49	20		
2,2-Dichloropropane	11.8	1.0	20	0	59.0	60 - 139	12.59	6.51	20	S	
2-Butanone	33.92	2.0	40	0	84.8	56 - 143	33.38	1.61	20		
2-Chlorotoluene	15.77	1.0	20	0	78.9	79 - 122	16.35	3.6	20	S	
2-Hexanone	41.84	2.0	40	0	105	57 - 139	41.86	0.0663	20		
4-Chlorotoluene	15.74	1.0	20	0	78.7	78 - 122	16.25	3.15	20		
4-Isopropyltoluene	16.72	1.0	20	0	83.6	77 - 127	17.21	2.85	20		
4-Methyl-2-pentanone	42.12	2.0	40	0	105	67 - 130	41.98	0.318	20		
Acetone	26.48	2.0	40	0	66.2	39 - 160	26.96	1.79	20		
Benzene	14.74	1.0	20	0	73.7	79 - 120	15.37	4.14	20	S	
Bromobenzene	15.42	1.0	20	0	77.1	80 - 120	15.83	2.63	20	S	
Bromochloromethane	13.09	1.0	20	0	65.5	78 - 123	13.59	3.75	20	S	
Bromodichloromethane	14.51	1.0	20	0	72.5	79 - 125	14.7	1.31	20	S	
Bromoform	14.51	1.0	20	0	72.6	66 - 130	14.56	0.324	20		

ALS Houston, US

Date: 12-Aug-19

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS19080443

QC BATCH REPORT

Batch ID: R344032 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MSD	Sample ID: HS19080443-02MSD	Units: UG/L			Analysis Date: 10-Aug-2019 02:16					
Client ID: LHSMW58-190807	Run ID: VOA6_344032	SeqNo: 5204484	PrepDate:	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromomethane	14.4	1.0	20	0	72.0	53 - 141	16.62	14.3	20	
Carbon disulfide	39.18	2.0	40	0	97.9	64 - 133	41.47	5.68	20	
Carbon tetrachloride	14.75	1.0	20	0	73.8	72 - 136	15.42	4.45	20	
Chlorobenzene	15.49	1.0	20	0	77.5	82 - 118	15.86	2.37	20	S
Chloroethane	13.57	1.0	20	0	67.9	60 - 138	14.57	7.11	20	
Chloroform	13.6	1.0	20	0	68.0	79 - 124	14.25	4.65	20	S
Chloromethane	10.45	1.0	20	0	52.3	50 - 139	11.09	5.91	20	
cis-1,2-Dichloroethene	13.71	1.0	20	0	68.5	78 - 123	14.26	3.95	20	S
cis-1,3-Dichloropropene	14.09	1.0	20	0	70.5	75 - 124	14.32	1.57	20	S
Dibromochloromethane	14.87	1.0	20	0	74.4	74 - 126	15.06	1.25	20	
Dibromomethane	14.23	1.0	20	0	71.1	79 - 123	14.32	0.675	20	S
Dichlorodifluoromethane	7.819	1.0	20	0	39.1	32 - 152	8.367	6.77	20	
Ethylbenzene	16.07	1.0	20	0	80.4	79 - 121	16.48	2.54	20	
Hexachlorobutadiene	18.25	1.0	20	0	91.3	66 - 134	18.63	2.02	20	
Isopropylbenzene	16.34	1.0	20	0	81.7	72 - 131	16.89	3.29	20	
m,p-Xylene	31.48	2.0	40	0	78.7	80 - 121	32.74	3.94	20	S
Methylene chloride	13.94	2.0	20	0	69.7	74 - 124	14.62	4.76	20	S
Naphthalene	13.21	1.0	20	0	66.0	61 - 128	13.37	1.2	20	
n-Butylbenzene	16.85	1.0	20	0	84.2	75 - 128	17.45	3.49	20	
n-Propylbenzene	16.59	1.0	20	0	82.9	76 - 126	17.2	3.63	20	
o-Xylene	15.8	1.0	20	0	79.0	78 - 122	16.25	2.78	20	
sec-Butylbenzene	16.91	1.0	20	0	84.6	77 - 126	17.55	3.71	20	
Styrene	15.76	1.0	20	0	78.8	78 - 123	16.07	1.97	20	
tert-Butylbenzene	16.79	1.0	20	0	84.0	78 - 124	17.5	4.12	20	
Tetrachloroethene	22.33	1.0	20	6.846	77.4	74 - 129	23.4	4.67	20	
Toluene	15.8	1.0	20	0	79.0	80 - 121	16.25	2.78	20	S
trans-1,2-Dichloroethene	13.59	1.0	20	0	67.9	75 - 124	14.43	6.03	20	S
trans-1,3-Dichloropropene	13.73	1.0	20	0	68.6	73 - 127	13.78	0.419	20	S
Trichloroethene	15.39	1.0	20	0.5885	74.0	79 - 123	16.14	4.74	20	S
Trichlorofluoromethane	13.65	1.0	20	0	68.3	65 - 141	14.48	5.85	20	
Vinyl chloride	11.89	1.0	20	0	59.5	58 - 137	12.55	5.36	20	
Surr: 1,2-Dichloroethane-d4	45.07	1.0	50	0	90.1	81 - 118	45.39	0.723	20	
Surr: 4-Bromofluorobenzene	50.65	1.0	50	0	101	85 - 114	50.08	1.14	20	
Surr: Dibromofluoromethane	46.26	1.0	50	0	92.5	80 - 119	46.42	0.344	20	

ALS Houston, US

Date: 12-Aug-19

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS19080443

QC BATCH REPORT

Batch ID: R344032 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MSD	Sample ID: HS19080443-02MSD	Units: UG/L			Analysis Date: 10-Aug-2019 02:16					
Client ID: LHSMW58-190807	Run ID: VOA6_344032	SeqNo: 5204484		PrepDate:		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual	
<i>Surr: Toluene-d8</i>	50.38	1.0	50	0	101	89 - 112	49.93	0.897	20	

The following samples were analyzed in this batch:									
HS19080443-01	HS19080443-02	HS19080443-03	HS19080443-04						
HS19080443-05	HS19080443-06	HS19080443-07	HS19080443-08						

ALS Houston, US

Date: 12-Aug-19

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS19080443

**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 Quantitation Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	19-028-0	27-Mar-2020
California	2919, 2019-2020	30-Apr-2020
Dept of Defense	ANAB L2231	20-Dec-2021
Kentucky	123043, 2019-2020	30-Apr-2020
Louisiana	03087, 2019-2020	30-Jun-2020
Maryland	343, 2019-2020	30-Jun-2020
North Carolina	624-2019	31-Dec-2019
Oklahoma	2018-156	31-Aug-2019
Texas	TX104704231-19-23	30-Apr-2020

ALS Houston, US

Date: 12-Aug-19

Sample Receipt Checklist

Client Name: CBI-Houston
Work Order: HS19080443

Date/Time Received: 08-Aug-2019 08:45
Received by: JRM

Checklist completed by: Bernadette A. Fini 9-Aug-2019
eSignature Date

Reviewed by: RJ Modashia 9-Aug-2019
eSignature Date

Matrices: **water**

Carrier name: **FedEx Priority Overnight**

- Shipping container/cooler in good condition? Yes No Not Present
- Custody seals intact on shipping container/cooler? Yes No Not Present
- Custody seals intact on sample bottles? Yes No Not Present
- 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): 2.2,2.2 uc/c IR 25

Cooler(s)/Kit(s): 44299

Date/Time sample(s) sent to storage: 8-9-19 08:00

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:

APTIM		Page 1 of												
COC ID: LHAAP37-AUG2019-ALS		TURNAROUND TIME:			RUSH:									
PROJECT/CLIENT INFO				LABORATORY			OTHER INFO							
Facility Name	Loughm AAP			Lab Name	ALS Laboratories			Email Invoice To	Fedinvoices@aptim.com					
Project Number	501032			Lab Contact	RJ Modashia			Email Report To	Susan.Huang@aptim.com					
Address				Address			Address							
LHAAP-37				RJ.Modashia@alsglobal.com			4005 Post Chicago Highway, Suite 200							
1203-B East Grand Avenue				10450 Stancilff Rd., Suite 210			Concord							
PMB 202				Houston			94520							
City	Marshall	State	TX	City	Houston	State	TX	City	Concord	State	CA			
Postal Code	75670	Country	USA	Postal Code	77099	Country	USA	Postal Code	94520	Country	USA			
Phone Number	713.243.7264			Phone Number	281.575.2279 or 281.530.5656			Shipping Company:						
Project Manager	Praveen Srivastav													
SAMPLE DETAILS														
Sample ID	Location	Start Depth	End Depth	Depth Unit	Field Matrix	Date	Time (24hr)	# Of Cont.	ANALYSIS	ANALYSIS REQUESTED				
										Sample Container and Preservatives	3-40 ml VOA/ICL	3-40 ml VOA/ICL	3-40 ml VOA/Cool to 6 deg C	2-40ml Amber/H2SO4
										HS19080443 Aptim Environmental & Infrastructure, Inc. Longhorn Army Ammunition Plant				
														
35Bww11-190807	LHAAP 37	19.66	19.88		WG	8/7/19	0800	3		X				
35Bww12-190807	LHAAP 37	22.12	22.36		WG	8/7/19	0845	3		X				
35Bww13-190807-MS	LHAAP 37	22.12	22.36		WG	8/7/19	0845	3		X				
35Bww14-190807-MSD	LHAAP 37	22.12	22.36		WG	8/7/19	0845	3		X				
35Bww24-190807	LHAAP 37	27.45	27.69		WG	8/7/19	0935	3		X				
35Bww25-190807	LHAAP 37	25.28	25.50		WG	8/7/19	1020	3		X				
35Bww16-190807	LHAAP 37	20.36	21.08		WG	8/7/19	1105	3		X				
35Bww17-190807	LHAAP 37	19.63	19.84		WG	8/7/19	1155	3		X				
35Bww17-190807-MS	LHAAP 37	19.63	19.84		WG	8/7/19	1155	3		X				
35Bww17-190807-MSD	LHAAP 37	19.63	19.84		WG	8/7/19	1155	3		X				
35Bww15-190807	LHAAP 37	21.20	21.41		WG	8/7/19	1245	3		X				
TRIP Blank	LHAAP 37				W	8/7/19		2		X				
ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS				RELINQUISHED BY/AFFILIATION		DATE/TIME		ACCEPTED BY/AFFILIATION		DATE/TIME				
				Susan Praveen / BSA/AL		8/7/19 1430		J.M.		08/08/19 08:45				

u/c
202
IR#25
CFO-0
44299

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

44299

CUSTODY SEAL

Date: *8/7/19* Time: *1430*
 Name: *Scott Beck*
 Company: *ALTA*

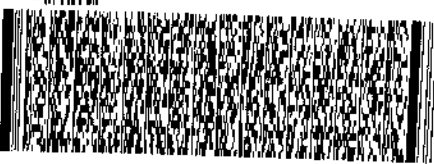
Seal Broken By:
 Date:

UNITED STATES US

TO **CLIENT SERVICES**
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON TX 77099

ND
44299
08/09/19

(281) 630-6666
 REF: LHAAP 37 - RJ



TRK# **AR00 7836 1802**
FedEx
4809 7836 1802

RETURNS MON-SA.
PRIORITY OVERNIGHT
THU - 08 AUG 10:30A
PRIORITY OVERNIGHT
77099

Appendix E

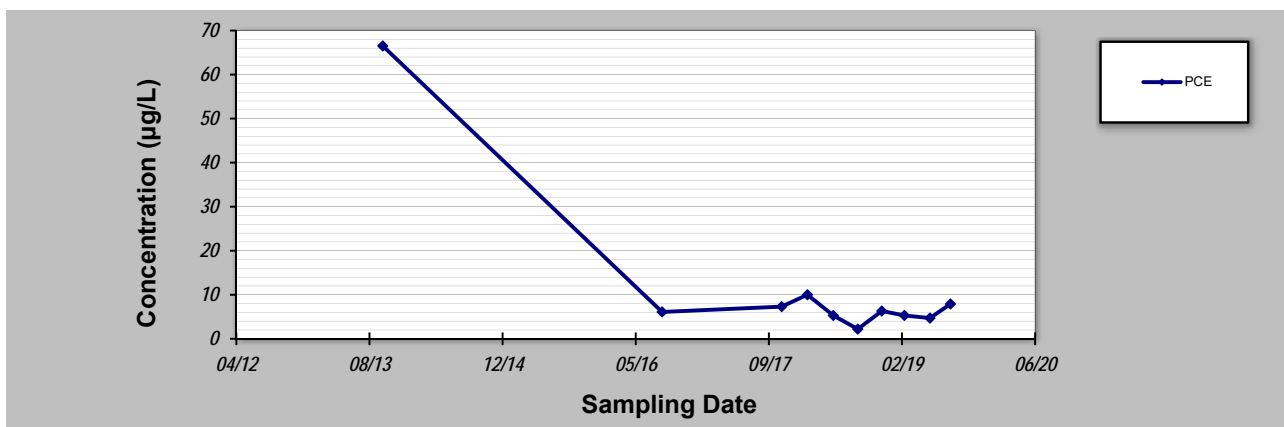
Mann-Kendall Trend Test Results

GSI MANN-KENDALL TOOLKIT for Constituent Trend Analysis

Evaluation Date: 18-Nov-19	Job ID: 501032
Facility Name: LHAAP-37	Constituent: 35BWW04
Conducted By: Jonathan Reagan	Concentration Units: µg/L
Sampling Point ID: PCE	

Sampling Event	Sampling Date	35BWW04 CONCENTRATION (µg/L)					
1	3-Oct-13	67					
2	17-Aug-16	6.1					
3	9-Nov-17	7.3					
4	14-Feb-18	10					
5	22-May-18	5.3					
6	22-Aug-18	2.2					
7	20-Nov-18	6.3					
8	13-Feb-19	5.3					
9	20-May-19	4.7					
10	5-Aug-19	7.9					
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							

Coefficient of Variation:	1.58
Mann-Kendall Statistic (S):	-14
Confidence Factor:	87.3%
Concentration Trend:	No Trend



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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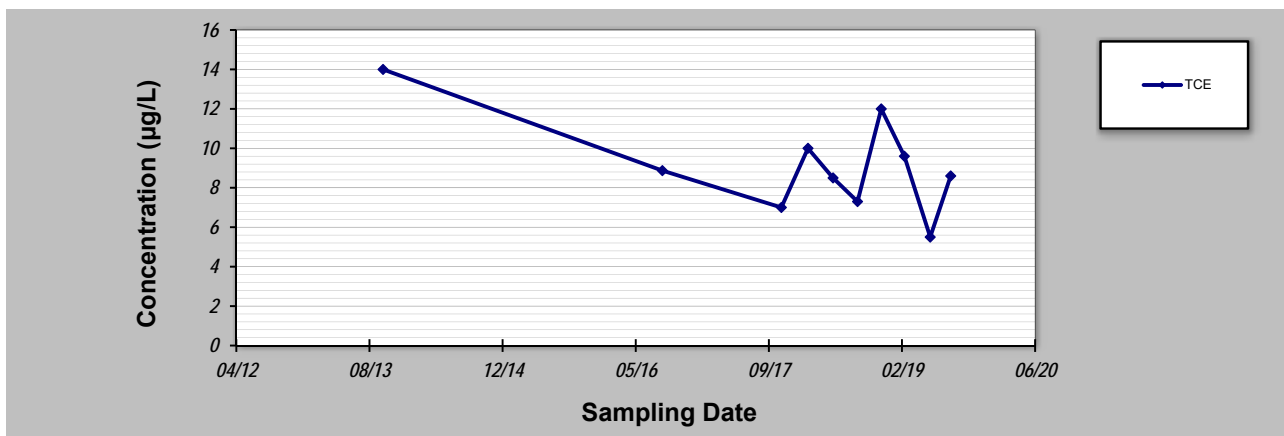
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GSI MANN-KENDALL TOOLKIT for Constituent Trend Analysis

Evaluation Date: 18-Nov-19	Job ID: 501032
Facility Name: LHAAP-37	Constituent: 35BWW05
Conducted By: Jonathan Reagan	Concentration Units: µg/L
Sampling Point ID: TCE	

Sampling Event	Sampling Date	35BWW05 CONCENTRATION (µg/L)					
1	4-Oct-13	14					
2	18-Aug-16	8.9					
3	8-Nov-17	7.0					
4	16-Feb-18	10					
5	21-May-18	8.5					
6	21-Aug-18	7.3					
7	18-Nov-18	12					
8	13-Feb-19	9.6					
9	21-May-19	5.5					
10	6-Aug-19	8.6					
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							

Coefficient of Variation:	0.27
Mann-Kendall Statistic (S):	-11
Confidence Factor:	81.0%
Concentration Trend:	Stable



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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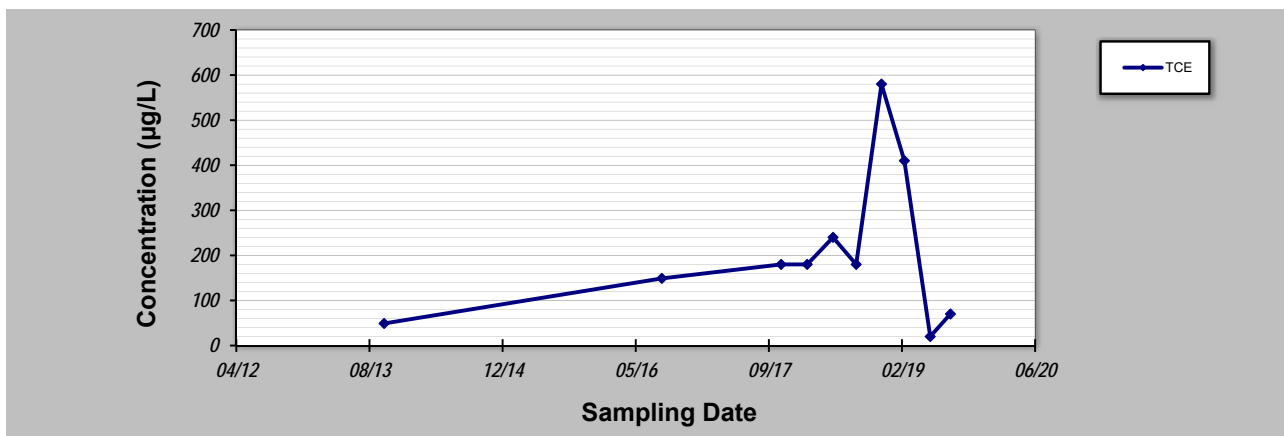
GSI MANN-KENDALL TOOLKIT for Constituent Trend Analysis

Evaluation Date: 19-Nov-19	Job ID: 501032
Facility Name: LHAAP-37	Constituent: 35BWW09
Conducted By: Jonathan Reagan	Concentration Units: µg/L

Sampling Point ID: **TCE**

Sampling Event	Sampling Date	35BWW09 CONCENTRATION (µg/L)					
1	8-Oct-13	49					
2	16-Aug-16	149					
3	7-Nov-17	180					
4	13-Feb-18	180					
5	21-May-18	240					
6	16-Aug-18	180					
7	19-Nov-18	580					
8	13-Feb-19	410					
9	21-May-19	20					
10	5-Aug-19	70					
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							

Coefficient of Variation:	0.83
Mann-Kendall Statistic (S):	8
Confidence Factor:	72.9%
Concentration Trend:	No Trend



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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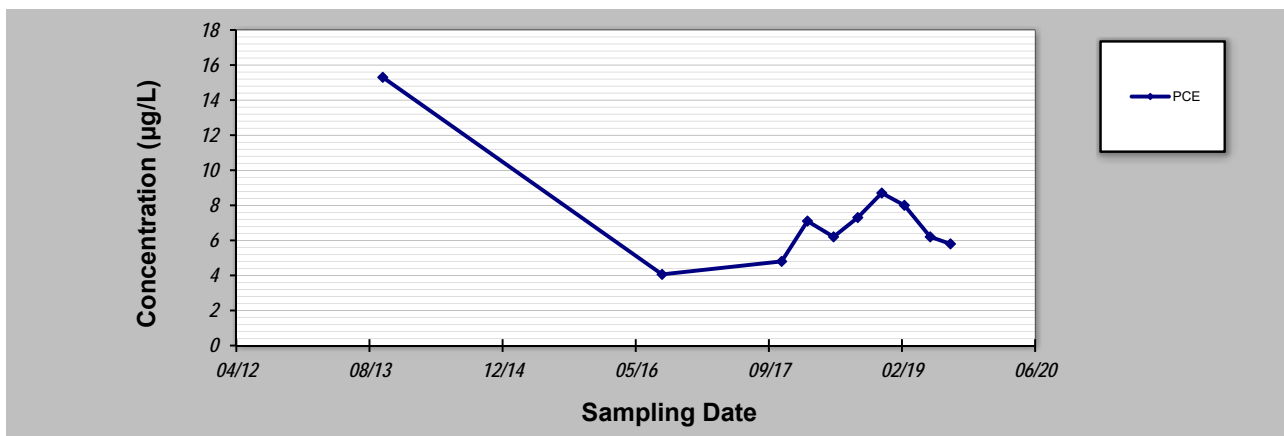
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GSI MANN-KENDALL TOOLKIT for Constituent Trend Analysis

Evaluation Date: 19-Nov-19	Job ID: 501032
Facility Name: LHAAP-37	Constituent: 35BWW12
Conducted By: Jonathan Reagan	Concentration Units: µg/L
Sampling Point ID: PCE	

Sampling Event	Sampling Date	35BWW12 CONCENTRATION (µg/L)					
1	3-Oct-13	15.3					
2	17-Aug-16	4.1					
3	9-Nov-17	4.8					
4	14-Feb-18	7.1					
5	23-May-18	6.2					
6	22-Aug-18	7.3					
7	20-Nov-18	8.7					
8	13-Feb-19	8.0					
9	21-May-19	6.2					
10	5-Aug-19	5.8					
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							

Coefficient of Variation:	0.43
Mann-Kendall Statistic (S):	2
Confidence Factor:	53.5%
Concentration Trend:	No Trend



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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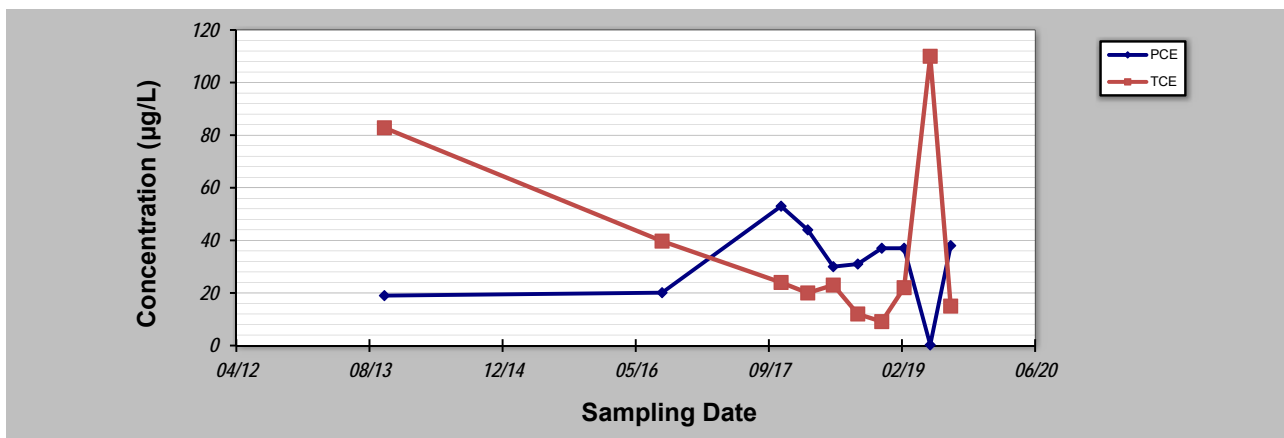
GSI MANN-KENDALL TOOLKIT for Constituent Trend Analysis

Evaluation Date: 19-Nov-19	Job ID: 501032
Facility Name: LHAAP-37	Constituent: 35BWW14
Conducted By: Jonathan Reagan	Concentration Units: µg/L

Sampling Point ID:	PCE	TCE	
--------------------	------------	------------	--

Sampling Event	Sampling Date	35BWW14 CONCENTRATION (µg/L)			
1	9-Oct-13	19	83		
2	17-Aug-16	20	40		
3	7-Nov-17	53	24		
4	15-Feb-18	44	20		
5	22-May-18	30	23		
6	22-Aug-18	31	12		
7	20-Nov-18	37	9.1		
8	12-Feb-19	37	22		
9	21-May-19	0.25	110		
10	6-Aug-19	38	15		
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					

Coefficient of Variation:	0.48	0.94	
Mann-Kendall Statistic (S):	6	-17	
Confidence Factor:	66.8%	92.2%	
Concentration Trend:	No Trend	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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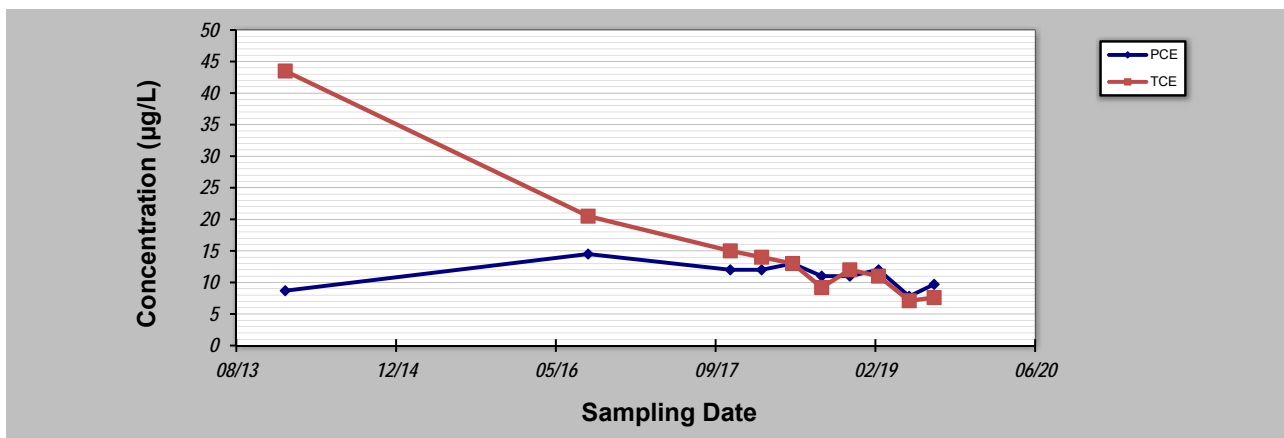
GSI MANN-KENDALL TOOLKIT for Constituent Trend Analysis

Evaluation Date: 19-Nov-19	Job ID: 501032
Facility Name: LHAAP-37	Constituent: 35BWW15
Conducted By: Jonathan Reagan	Concentration Units: µg/L

Sampling Point ID:	PCE	TCE				
--------------------	------------	------------	--	--	--	--

Sampling Event	Sampling Date	35BWW15 CONCENTRATION (µg/L)					
1	14-Jan-14	8.7	44				
2	19-Aug-16	15	21				
3	7-Nov-17	12	15				
4	13-Feb-18	12	14				
5	21-May-18	13	13				
6	20-Aug-18	11	9.2				
7	16-Nov-18	11	12				
8	14-Feb-19	12	11				
9	21-May-19	7.8	7.1				
10	7-Aug-19	9.7	7.6				
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							

Coefficient of Variation:	0.18	0.70				
Mann-Kendall Statistic (S):	-15	-39				
Confidence Factor:	89.2%	>99.9%				
Concentration Trend:	Stable	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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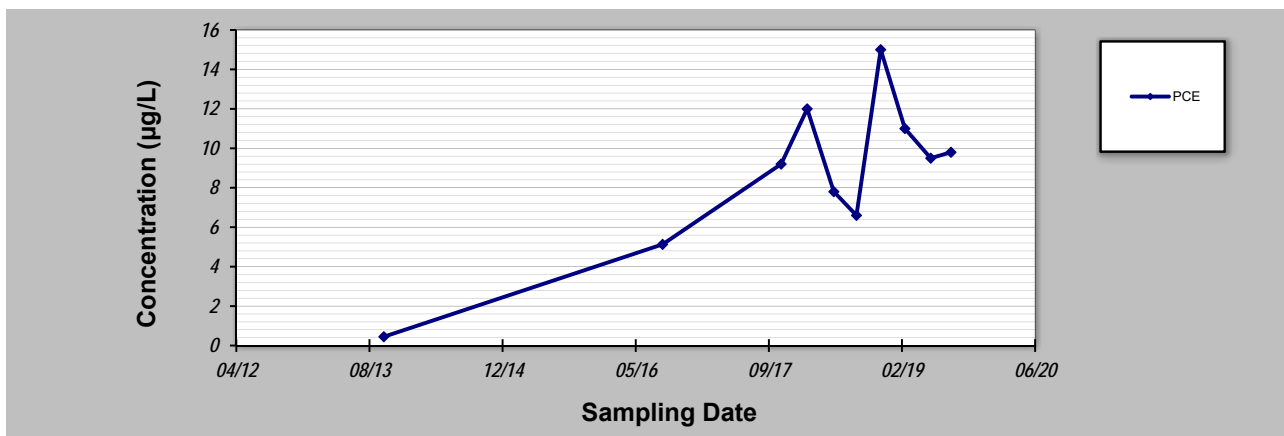
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GSI MANN-KENDALL TOOLKIT for Constituent Trend Analysis

Evaluation Date: 19-Nov-19	Job ID: 501032
Facility Name: LHAAP-37	Constituent: 35BWW16
Conducted By: Jonathan Reagan	Concentration Units: µg/L
Sampling Point ID: PCE	

Sampling Event	Sampling Date	35BWW16 CONCENTRATION (µg/L)					
1	7-Oct-13	0.45					
2	19-Aug-16	5.13					
3	7-Nov-17	9.2					
4	13-Feb-18	12					
5	24-May-18	7.8					
6	17-Aug-18	6.6					
7	16-Nov-18	15					
8	15-Feb-19	11					
9	23-May-19	9.5					
10	7-Aug-19	9.8					
11							
12							
13							
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18							
19							
20							

Coefficient of Variation:	0.46
Mann-Kendall Statistic (S):	19
Confidence Factor:	94.6%
Concentration Trend:	Prob. Increasing



Notes:

- At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
- 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.
- 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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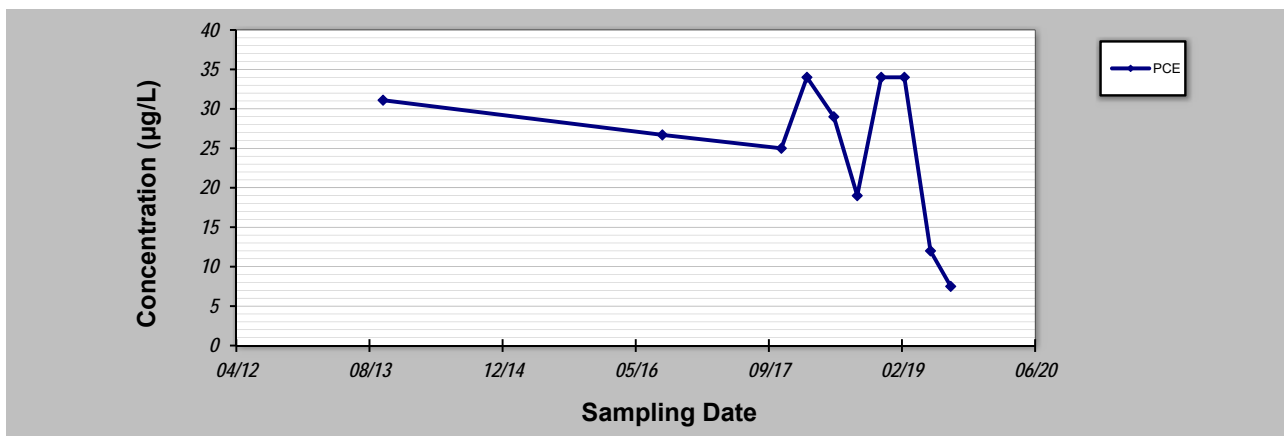
GSI MANN-KENDALL TOOLKIT for Constituent Trend Analysis

Evaluation Date: 19-Nov-19	Job ID: 501032
Facility Name: LHAAP-37	Constituent: 35BWW20
Conducted By: Jonathan Reagan	Concentration Units: µg/L

Sampling Point ID: **PCE**

Sampling Event	Sampling Date	35BWW20 CONCENTRATION (µg/L)					
1	4-Oct-13	31					
2	18-Aug-16	27					
3	8-Nov-17	25					
4	12-Feb-18	34					
5	24-May-18	29					
6	20-Aug-18	19					
7	18-Nov-18	34					
8	13-Feb-19	34					
9	22-May-19	12					
10	6-Aug-19	7.5					
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							

Coefficient of Variation:	0.38
Mann-Kendall Statistic (S):	-12
Confidence Factor:	83.2%
Concentration Trend:	Stable



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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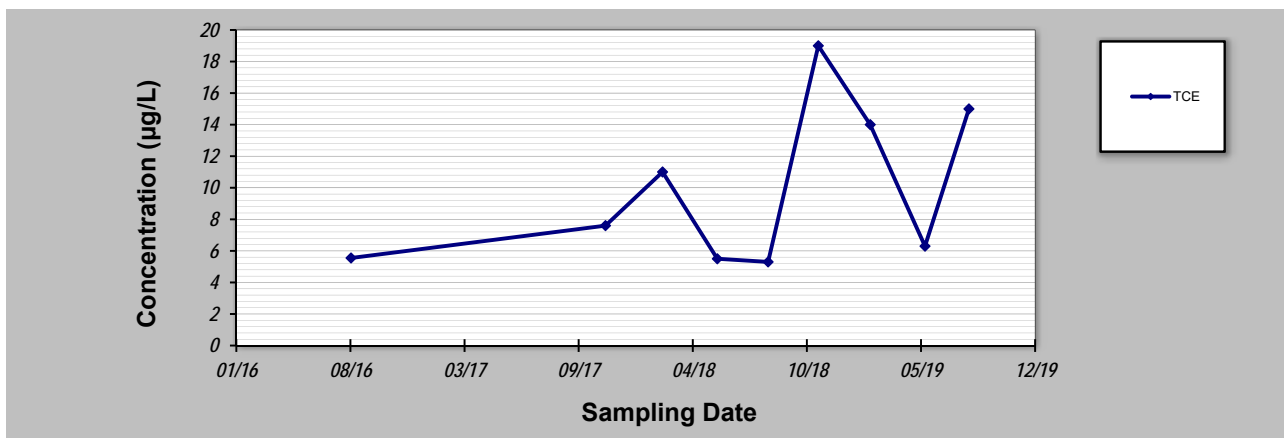
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GSI MANN-KENDALL TOOLKIT for Constituent Trend Analysis

Evaluation Date: 19-Nov-19	Job ID: 501032
Facility Name: LHAAP-37	Constituent: 35BWW25
Conducted By: Jonathan Reagan	Concentration Units: µg/L
Sampling Point ID: TCE	

Sampling Event	Sampling Date	35BWW25 CONCENTRATION (µg/L)					
1	19-Aug-16	5.55					
2	8-Nov-17	7.6					
3	16-Feb-18	11					
4	23-May-18	5.5					
5	20-Aug-18	5.3					
6	16-Nov-18	19					
7	15-Feb-19	14					
8	22-May-19	6.3					
9	7-Aug-19	15					
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							

Coefficient of Variation:	0.51
Mann-Kendall Statistic (S):	10
Confidence Factor:	82.1%
Concentration Trend:	No Trend



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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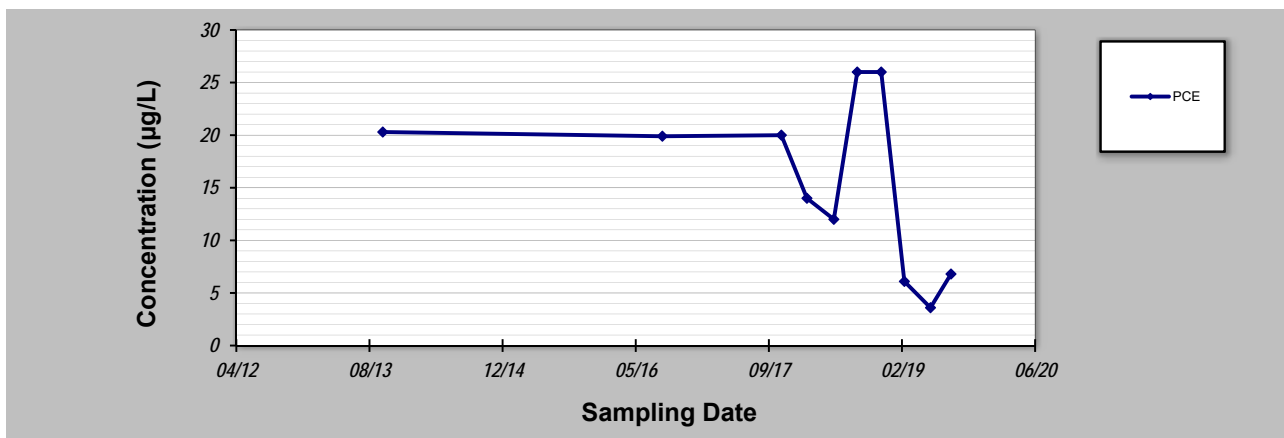
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GSI MANN-KENDALL TOOLKIT for Constituent Trend Analysis

Evaluation Date: 19-Nov-19	Job ID: 501032
Facility Name: LHAAP-37	Constituent: LHSMW58
Conducted By: Jonathan Reagan	Concentration Units: µg/L
Sampling Point ID: PCE	

Sampling Event	Sampling Date	LHSMW58 CONCENTRATION (µg/L)					
1	3-Oct-13	20					
2	18-Aug-16	20					
3	8-Nov-17	20					
4	12-Feb-18	14					
5	24-May-18	12					
6	20-Aug-18	26					
7	18-Nov-18	26					
8	13-Feb-19	6.1					
9	22-May-19	3.6					
10	7-Aug-19	6.8					
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							

Coefficient of Variation:	0.53
Mann-Kendall Statistic (S):	-18
Confidence Factor:	93.4%
Concentration Trend:	Prob. Decreasing



- Notes:**
- At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
 - 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.
 - 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.

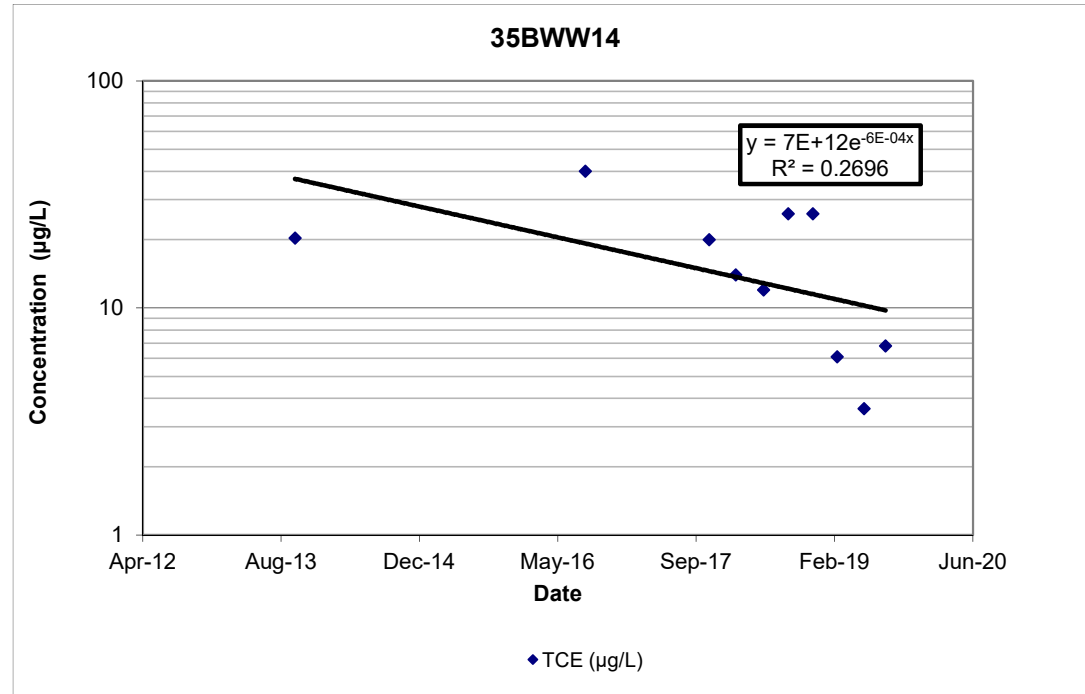
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Appendix F

Regression Analysis

**Time-Dependent Attenuation Rate Constant and Estimated Cleanup Time
35BWW14**

Date	TCE (µg/L)
3-Oct-13	20
17-Aug-16	40
8-Nov-17	20
12-Feb-18	14
24-May-18	12
20-Aug-18	26
18-Nov-18	26
13-Feb-19	6.1
22-May-19	3.6
7-Aug-19	6.8



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	6.00E-04	1155.2	3.2	6.8	5	1.4

Notes:

The estimated cleanup time was calculated as the time it would take the most recent detected TCE concentration to reach the MCL using the site-specific attenuation rate, and assuming first order degradation kinetics.

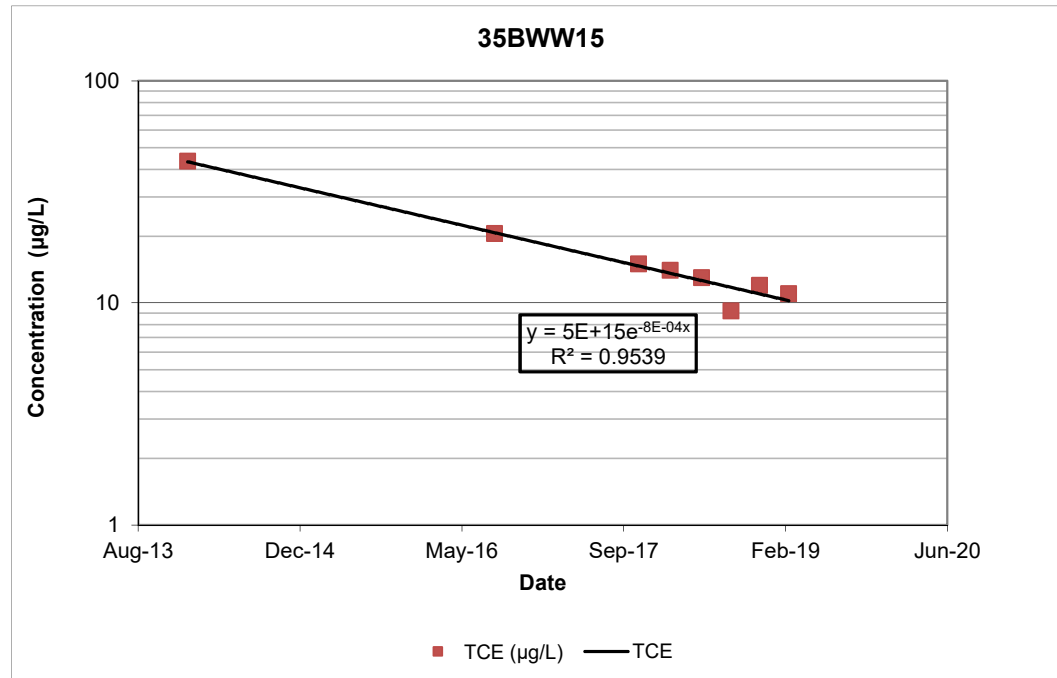
µg/L - micrograms per liter

MCL - maximum contaminant level

PCE - Tetrachloroethene

**Time-Dependent Attenuation Rate Constant and Estimated Cleanup Time
35BWW15**

Date	TCE (µg/L)
14-Jan-14	43.5
19-Aug-16	20.5
7-Nov-17	15
13-Feb-18	14
21-May-18	13
20-Aug-18	9.2
16-Nov-18	12
14-Feb-19	11
21-May-19	7.1
7-Aug-19	7.6



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	8.00E-04	866.4	2.4	7.6	5	1.4

Notes:

The estimated cleanup time was calculated as the time it would take the most recent detected TCE concentration to reach the MCL using the site-specific attenuation rate, and assuming first order degradation kinetics.

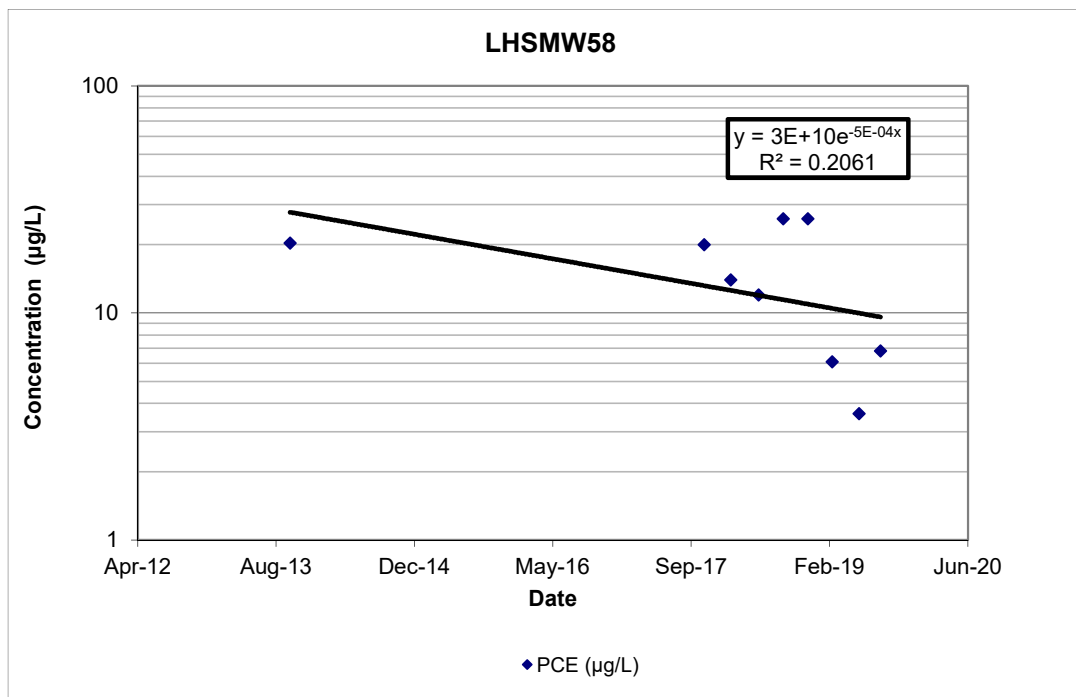
µg/L - micrograms per liter

MCL - maximum contaminant level

TCE - Trichloroethene

**Time-Dependent Attenuation Rate Constant and Estimated Cleanup Time
LHSMW58**

Date	PCE (µg/L)
3-Oct-13	20
8-Nov-17	20
12-Feb-18	14
24-May-18	12
20-Aug-18	26
18-Nov-18	26
13-Feb-19	6.1
22-May-19	3.6
7-Aug-19	6.8



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)
PCE	5.00E-04	1386.3	3.8	6.8	5	1.7

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

PCE - Tetrachloroethene

**QUARTERLY EVALUATION REPORT
4TH QUARTER (OCTOBER-DECEMBER) 2019
GROUNDWATER TREATMENT PLANT
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS**

APRIL 2020

Prepared For:



**U.S. Army Corps of Engineers
Tulsa District**

**Contract No. W9128F-13-D-0012
Task Order No. W912BV17F0150
Bhate Project No. NWO1312.0150.016.0001.03**

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LONGHORN ARMY AMMUNITION PLANT

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 Appendix B Groundwater Elevation Contour Maps
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 Appendix E Monitoring Well Trend Charts
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 Appendix H Air Monitoring Analytical Laboratory Report (Provided on CD Only)
 Appendix I Protocol for Discharging GWTP Effluent
 Appendix J Air Data Tables, PID Readings, and Calibration Logs

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ACRONYMS AND ABBREVIATIONS

AMCV(s)	Air Monitoring Comparison Value(s)
amsl	Above mean sea level
bgs	Below ground surface
Bhate	Bhate Environmental Associates, Inc.
CD	Compact disc
COC(s)	Chemical(s) of concern
COD	Chemical oxygen demand
DCE	Dichloroethene
ESD	Explanation of Significant Difference
ESL(s)	Effects Screening Level(s)
FBR	Fluidized bed reactor
ft	Feet or foot
gpd	Gallons per day
gph	Gallons per hour
gpm	Gallons per minute
GWTP	Groundwater Treatment Plant
HCl	Hydrochloric acid
HDPE	High density polyethylene
ICT(s)	Interception-collection trench(es)
IRA	Interim Remedial Action
J	Estimated concentration
lbs/hr	Pounds per hour
LHAAP	Longhorn Army Ammunition Plant
MCL(s)	Maximum Contaminant Level(s)
µg/L	Micrograms per liter
Mg(OH) ₂	Magnesium hydroxide
MSC(s)	Medium Specific Concentration(s)
mV	Millivolts
NA	Not applicable
NaOH	Sodium hydroxide
No.	Number

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ORP	Oxidation-reduction potential
PCL(s)	Protective Concentration Level(s)
PID	Photoionization detector
ppmv	Parts per million by volume
psi	Pounds per square inch
ROD	Record of Decision
TAC	Texas Administrative Code
TCE	Trichloroethene
TCEQ	Texas Commission on Environmental Quality
tpy	Tons per year
UEP	Unlined Evaporation Pond
USEPA	United States Environmental Protection Agency
VC	Vinyl chloride
VOC(s)	Volatile Organic Compound(s)

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EXECUTIVE SUMMARY

The operation of the Groundwater Treatment Plant (GWTP) is part of the Interim Remedial Action (IRA) at Burning Ground Number (No.) 3, also referred to as Longhorn Army Ammunition Plant (LHAAP)-18/24. A historical pilot test for nearby landfill LHAAP-16 resulted in the installation of eight extraction wells which also contribute groundwater to the GWTP. Groundwater extraction, treatment, and monitoring activities consist of:

- Continuous extraction of groundwater from multiple interception-collection trenches (ICTs) and extraction wells at both LHAAP-18/24 and LHAAP-16;
- Treatment of extracted groundwater for heavy metals, chlorinated compounds, and perchlorate using precipitation, air stripping, and biological methods, respectively;
- Evaluation of the hydraulic effectiveness of the extraction system by groundwater monitoring;
- Monitoring of treated groundwater to ensure compliance with the discharge limits; and
- Discharge of treated water to Harrison Bayou, or to a holding pond (INF Pond), or the treated water may be released as irrigation water on LHAAP-18/24.

The location of the extraction wells and ICTs are shown on **Figure A-1** in **Appendix A**. The process flow diagram of the GWTP is shown on **Figure A-2** in **Appendix A**.

Figure ES-1 depicts the monthly total volume of groundwater that was extracted from the ICTs and extraction wells at LHAAP-18/24 and LHAAP-16 between January 2014 and December 2019.

The GWTP was not operational during June, July, and August 2012. This was related to meltdown of the scrubber system, associated with the catalytic oxidizer, due to system overheating. Overheating occurred when the blower became inoperable after the bearing on the scrubber blower unit was shattered and damaged the blower. This occurred around 1:00 PM on 21 May 2012.

After developing an interim air monitoring plan and obtaining concurrence from the Texas Commission on Environmental Quality (TCEQ) and the United States Environmental Protection Agency (USEPA) to operate the GWTP without use of air abatement equipment, a pilot run of the GWTP was conducted on 6 September 2012. In that first pilot run, 85,170 gallons of water that had been stored in the influent equalization tank (TK-140) were treated. The treated water was re-circulated through the fluidized bed reactor (FBR) to revive the FBR after 3 months of dormancy. Treated groundwater and air samples were collected and analyzed respectively for perchlorate, metals, and Volatile Organic Compounds (VOCs); and VOCs only. On 19 September 2012, a second pilot run was performed at the GWTP and 107,264 gallons of water were treated. Based on the successful re-start of the GWTP, continuous groundwater extraction began again on 24 September 2012. While groundwater extraction occurs on a continuous basis, operation of the GWTP occurs intermittently due to the low volume of water available for treatment with respect to the design capacity of the GWTP. During the 3rd quarter of 2012, groundwater extraction occurred only from LHAAP-18/24. Groundwater extraction from LHAAP-16 was not performed due to equipment failure. However, extraction from LHAAP-16 began in October 2012

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and the extraction volumes increased steadily throughout the 4th quarter of 2012, as pumping equipment was gradually repaired/replaced. The GWTP operated under normal conditions until September 2015.

On 14 September 2015, at 11:15 AM, the blower on the air stripper (BL-340) malfunctioned during routine operation. The wiring on the blower was repaired and the blower operated for less than 2 hours on 17 September 2015, when the blower malfunctioned again. It was determined that the blower needed to be replaced, and groundwater extraction and operation of the GWTP ceased beginning 18 September 2015, as the influent equalization tank (TK-140) became full. Beginning on 2 October 2015, it was determined that the GWTP could operate without the blower at a reduced extraction rate. The operation of the GWTP allowed extraction of groundwater from ICTs 12E, 13A, 13B, and 13C (13C was changed to ICT 13E on 12 October 2015), which were considered critical ICTs to prevent migration of contaminants to Harrison Bayou. Groundwater extraction was switched frequently between ICTs 12E, 13A, 13B, and 13E to ICTs 14B, 14C, and 14D beginning on 14 December 2015.

On 12 December 2016, flange bolts at TK-380 failed and allowed hydrochloric acid (HCl) to drain into the sump. The containment area was washed down and the sump contents were transferred into the equalization tank (TK-140). Because of the acid release, extraction of groundwater from the ICTs was halted, and the GWTP was put into recycle mode (effluent sent back as influent) until the acid was neutralized and perchlorate, metals, and VOCs were below discharge criteria on 17 March 2017.

On 12 August 2017, severe storms caused a power outage at LHAAP-18/24. When electrical service was restored, the main transformer failed due to a manufacturing defect. A portable emergency generator was brought on-site on 21 August 2017, to allow the FBR to operate in full recycle mode. After a replacement transformer was installed on 12 September 2017, extraction began from ICT-13B, 13C, 13D, 13E, 13F, 7, and EW01 and the FBR was put into normal operation. Beginning on 21 September 2017, groundwater was extracted from all of the ICTs.

On 27 December 2018, severe storms caused a power outage in Karnack, Texas including LHAAP. When electrical service was restored, the main transformer failed due to a manufacturing defect. A portable emergency generator was brought on-site on 28 December 2018, to allow the FBR to operate in full recycle mode. After a temporary generator was connected to the well field on 11 February 2019, extraction began from LHAAP-18/24, and the GWTP was put into normal operation.

From 11 to 17 June 2019, a double walled pipe in the burning grounds (ICT-14C and ICT-14D) was found to be leaking at a joint and repaired. In addition, the line to 18WW17 was cut off due to leaks identified following repair of the other section of pipe. The ground was too wet to dig and replace the other double-walled pipe at that time. From 28 October to 31 October 2019, a new double walled pipe to 18WW17 was installed.

As shown on **Figure ES-1**, the total extracted groundwater volume from LHAAP-18/24 during the 4th quarter of 2019 was 1,244,318 gallons. The extracted groundwater volume was measured on a monthly basis as the sum of the difference between the flow meter totalizer reading at each

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ICT between the beginning and end of each month. Extraction quantities in LHAAP-18/24 were 368,656 gallons in October 2019, 409,924 gallons in November 2019, and 465,738 gallons in December 2019.

In September 2019, injections were implemented at LHAAP-16. Because of this, extraction of groundwater by the GWTP has ceased. The only groundwater treated and discussed within this 4th quarter 2019 report is from LHAAP-18/24.

The typical discharge flowrate from the GWTP was calculated as 10.5 gallons per minute (gpm) during the 4th quarter of 2019. Water discharge from the INF Pond averaged to 77 gpm. Approximately 433,751 gallons of groundwater was discharged from the GWTP to the Harrison Bayou, and no water was discharged from the INF Pond to the Harrison Bayou.

Grab perchlorate samples from the GWTP influent were collected on 8 October, 5 November, and 3 December 2019, and the following concentrations were reported: 12,000 micrograms per liter ($\mu\text{g/L}$); 10,000 $\mu\text{g/L}$; and 11,000 $\mu\text{g/L}$, respectively. A quarterly influent sample was collected and analyzed for perchlorate on 17 December 2019, and had a detection of 14,000 $\mu\text{g/L}$. Considering all four perchlorate results, the average perchlorate concentration in the GWTP influent during the quarter was 11,750 $\mu\text{g/L}$. No perchlorate concentrations in any effluent (TK-650) samples discharged to the Harrison Bayou exceeded the daily maximum effluent limit of 589 $\mu\text{g/L}$ during the quarter.

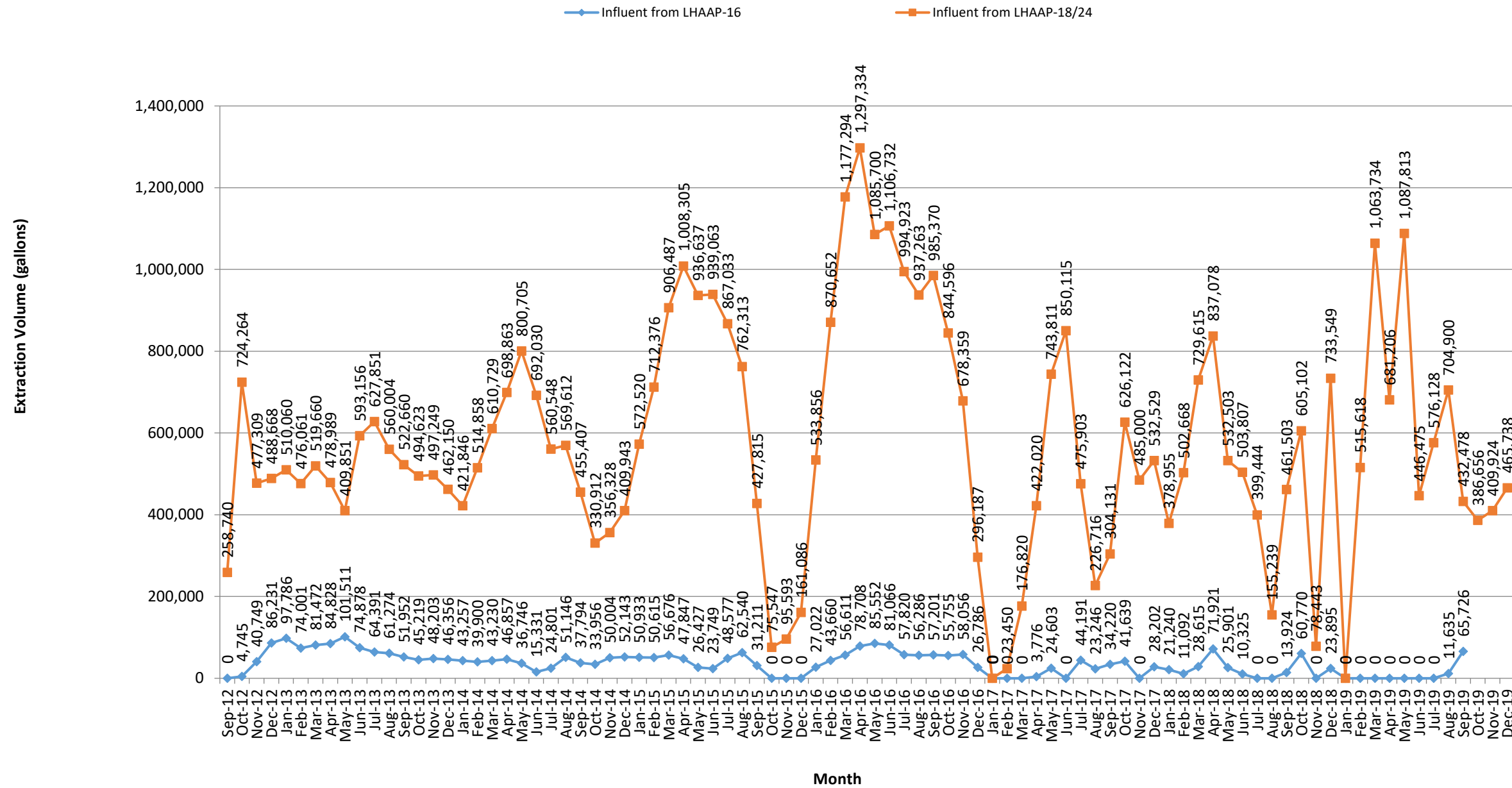
As shown in **Table ES-1**, 433,751 gallons of treated groundwater was discharged directly to the Harrison Bayou, with a majority of that occurring in December 2019. No treated groundwater was discharged from the INF Pond to the Harrison Bayou in the 4th quarter of 2019. **Table ES-1** also presents the INF Pond staff gauge readings by date, which is used to determine the freeboard available in the pond. During the 4th quarter of 2019, the freeboard was less than 3 feet, which requires TCEQ notification and request for reduction of the pond by another foot of freeboard. This notification was made on 4 December 2019 via email. However, treated groundwater, following the notification, was discharged to the Bayou from the GWTP. Water from the INF Pond was not discharged to the Bayou until 2020 due to scheduling conflicts that prevented the opening of the valve at the discharge point for the pond. A total of 458,556 gallons was discharged to the INF Pond during the 4th quarter of 2019. There was no water discharged to the Harrison Bayou in October 2019 due to low or no flow.

The groundwater volume extracted for treatment at the GWTP ranged from a low of 368,656 gallons in October 2019 to a high of 465,738 gallons in December 2019. The total water extracted for treatment by the GWTP in the 4th quarter of 2019 was approximately 1,244,318 gallons. The 3 month average was approximately 414,773 gallons per month. The total treated water quantities discharged to either the Harrison Bayou or INF Pond each month, since June 2012, are shown on **Figure ES-2**. The total volume of water extracted based upon the sum of the individual extraction wells and ICTs from LHAAP-18/24 in 4th quarter 2019 (1,244,318) is slightly higher than the volume of water discharged to the Harrison Bayou and the INF Pond combined (892,307 gallons). Typically the reason for the difference is identified as the change in volume stored in the GWTP, the amount of water lost with the removed metals precipitation sludge, and the amount of evaporative water lost in the air stripper (which is included in the volume processed, but not in the volume discharged). In addition to these reasons but unique to this quarter, the line out to 18WW17 being down for most of October due to a leak was also a factor.

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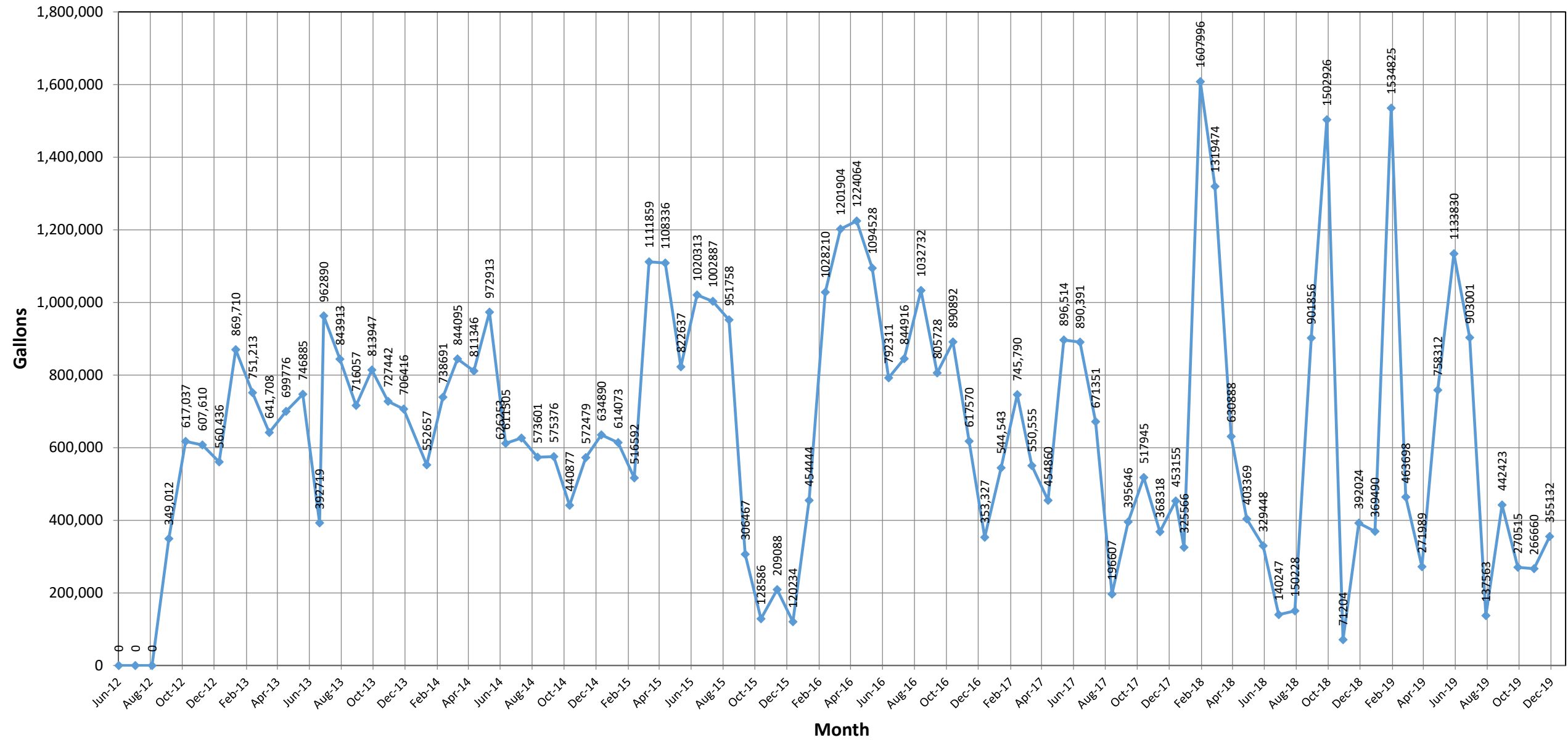
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**Figure ES-1: Groundwater Recovery Between September 2012 & September 2019
 LHAAP-18/24 & LHAAP-16**



Note: Starting in September 2019 no groundwater was extracted subsequent to the final remedy of injections being implemented at LHAAP-16.

Figure ES-2
Treated Groundwater Discharged Monthly from June 2012 through December 2019



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Table ES-1: Discharge Information to Harrison Bayou During 4th Quarter 2019

Date	Harrison Bayou Flow (gpm)	Maximum Flow Allowed (gpm)	Released From GWTP To Harrison Bayou	Released From INF Pond to Harrison Bayou	Released From GWTP to INF Pond	Combined Total Released to Harrison Bayou	INF Pond Staff Reading (6.20 = 3 ft. Freeboard)
10/01/2019	NA	NA	0	0	17,719	0	4.17
10/02/2019	NA	NA	0	0	22,927	0	4.25
10/03/2019	NA	NA	0	0	20,169	0	4.32
10/04/2019	NA	NA	0	0	15,981	0	4.36
10/05/2019	NA	NA	0	0	0	0	4.39
10/06/2019	NA	NA	0	0	0	0	4.42
10/07/2019	NA	NA	0	0	66,127	0	4.45
10/08/2019	NA	NA	0	0	8,037	0	4.48
10/09/2019	NA	NA	0	0	14,050	0	4.55
10/10/2019	NA	NA	0	0	10,407	0	4.58
10/11/2019	NA	NA	0	0	0	0	4.62
10/12/2019	NA	NA	0	0	0	0	4.62
10/13/2019	NA	NA	0	0	0	0	4.61
10/14/2019	NA	NA	0	0	0	0	4.60
10/15/2019	NA	NA	0	0	10,324	0	4.75
10/16/2019	NA	NA	0	0	25,984	0	4.84
10/17/2019	NA	NA	0	0	18,729	0	4.91
10/18/2019	NA	NA	0	0	0	0	4.91
10/19/2019	NA	NA	0	0	0	0	4.90
10/20/2019	NA	NA	0	0	0	0	4.90
10/21/2019	NA	NA	0	0	2,186	0	5.02
10/22/2019	NA	NA	0	0	16,661	0	5.05
10/23/2019	NA	NA	0	0	14,882	0	5.10
10/24/2019	NA	NA	0	0	6,332	0	5.12

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Date	Harrison Bayou Flow (gpm)	Maximum Flow Allowed (gpm)	Released From GWTP To Harrison Bayou	Released From INF Pond to Harrison Bayou	Released From GWTP to INF Pond	Combined Total Released to Harrison Bayou	INF Pond Staff Reading (6.20 = 3 ft. Freeboard)
10/25/2019	NA	NA	0	0	0	0	5.20
10/26/2019	NA	NA	0	0	0	0	5.31
10/27/2019	NA	NA	0	0	0	0	5.31
10/28/2019	NA	NA	0	0	0	0	5.30
10/29/2019	NA	NA	0	0	0	0	5.30
10/30/2019	NA	NA	0	0	0	0	5.43
10/31/2019	NA	NA	0	0	0	0	5.71
11/01/2019	12,595	2,304	0	0	0	0	5.71
11/02/2019	10,679	1,954	0	0	0	0	5.71
11/03/2019	8,965	1,640	0	0	0	0	5.70
11/04/2019	7,877	1,441	40,572	0	0	40,572	5.70
11/05/2019	NA	NA	0	0	0	0	5.70
11/06/2019	NA	NA	0	0	0	0	5.69
11/07/2019	NA	NA	0	0	0	0	5.69
11/08/2019	3,083	564	1,689	0	0	1,689	5.69
11/09/2019	2,765	505	0	0	0	0	5.69
11/10/2019	2,498	457	0	0	0	0	5.68
11/11/2019	2,224	406	41,166	0	0	41,166	5.68
11/12/2019	NA	NA	0	0	0	0	5.68
11/13/2019	NA	NA	0	0	0	0	5.67
11/14/2019	NA	NA	0	0	0	0	5.67
11/15/2019	453	103	0	0	0	0	5.67
11/16/2019	387	88	0	0	0	0	5.67
11/17/2019	295	67	0	0	0	0	5.67

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Date	Harrison Bayou Flow (gpm)	Maximum Flow Allowed (gpm)	Released From GWTP To Harrison Bayou	Released From INF Pond to Harrison Bayou	Released From GWTP to INF Pond	Combined Total Released to Harrison Bayou	INF Pond Staff Reading (6.20 = 3 ft. Freeboard)
11/18/2019	259	59	32,076	0	0	32,076	5.66
11/19/2019	NA	NA	0	0	0	0	5.66
11/20/2019	NA	NA	0	0	27,827	0	5.73
11/21/2019	NA	NA	0	0	2,447	0	5.81
11/22/2019	NA	NA	0	0	15,566	0	5.85
11/23/2019	NA	NA	0	0	0	0	5.88
11/24/2019	NA	NA	0	0	0	0	5.92
11/25/2019	NA	NA	0	0	48,042	0	5.96
11/26/2019	NA	NA	0	0	13,074	0	5.98
11/27/2019	NA	NA	0	0	10,104	0	6.00
11/28/2019	NA	NA	0	0	0	0	6.03
11/29/2019	NA	NA	0	0	0	0	6.05
11/30/2019	NA	NA	0	0	34,097	0	6.08
12/01/2019	NA	NA	0	0	0	0	6.14
12/02/2019	NA	NA	0	0	21,548	0	6.18
12/03/2019	NA	NA	0	0	15,336	0	6.22
12/04/2019	NA	NA	0	0	0	0	6.23
12/05/2019	NA	NA	0	0	0	0	6.23
12/06/2019	NA	NA	0	0	0	0	6.22
12/07/2019	NA	NA	0	0	0	0	6.22
12/08/2019	NA	NA	0	0	0	0	6.22
12/09/2019	349	79	6,823	0	0	6,823	6.21
12/10/2019	381	87	22,687	0	0	22,687	6.30
12/11/2019	549	125	25,656	0	0	25,656	6.30
12/12/2019	881	201	22,396	0	0	22,396	6.30

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Date	Harrison Bayou Flow (gpm)	Maximum Flow Allowed (gpm)	Released From GWTP To Harrison Bayou	Released From INF Pond to Harrison Bayou	Released From GWTP to INF Pond	Combined Total Released to Harrison Bayou	INF Pond Staff Reading (6.20 = 3 ft. Freeboard)
12/13/2019	765	174	12,218	0	0	12,218	6.29
12/14/2019	963	220	0	0	0	0	6.29
12/15/2019	872	199	0	0	0	0	6.29
12/16/2019	821	187	33,848	0	0	33,848	6.28
12/17/2019	759	173	11,925	0	0	11,925	6.28
12/18/2019	695	158	13,018	0	0	13,018	6.27
12/19/2019	554	126	13,575	0	0	13,575	6.27
12/20/2019	661	151	14,437	0	0	14,437	6.27
12/21/2019	590	134	0	0	0	0	6.27
12/22/2019	502	114	0	0	0	0	6.26
12/23/2019	461	105	42,297	0	0	42,297	6.26
12/24/2019	434	98	0	0	0	0	6.26
12/25/2019	391	89	0	0	0	0	6.25
12/26/2019	308	90	39,759	0	0	39,759	6.25
12/27/2019	262	76	12,593	0	0	12,593	6.25
12/28/2019	235	52	0	0	0	0	6.26
12/29/2019	445	120	0	0	0	0	6.29
12/30/2019	541	148	47,016	0	0	47,016	6.29
12/31/2019	502	135	0	0	0	0	6.29
TOTALS			433,751	0	458,556	433,751	

Notes: The maximum discharge rate from the INF Pond is 170 gallons per minute (gpm) and the maximum discharge rate from the GWTP is 30 gpm.

NA = Not applicable

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1 EVALUATION OF GROUNDWATER TREATMENT PLANT

The Groundwater Treatment Plant (GWTP) was constructed as part of the Interim Remedial Action (IRA) at Burning Ground Number (No.) 3, also referred to as Longhorn Army Ammunition Plant (LHAAP)-18/24, to treat groundwater extracted from interception-collection trenches (ICTs) and extraction wells. **Figure A-1** located in **Appendix A** presents the layout of the ICTs and extraction wells at LHAAP-18/24. The groundwater contamination at LHAAP-18/24 likely resulted from infiltration from an Unlined Evaporation Pond (UEP) that was used to store manufacturing wastewater, and from burning trenches and other industrial processes used to flash pyrotechnic, propellant, and explosive waste streams. The groundwater at LHAAP-18/24 is contaminated mainly with chlorinated ethenes and perchlorate, with lesser concentrations of 1,4-dioxane.

The GWTP also receives flow from eight extraction wells installed at LHAAP-16 as part of a historical treatability study. The extraction wells were installed in 1996 and 1997. The wells are located between the landfill at LHAAP-16 and Harrison Bayou. The groundwater at LHAAP-16 is also contaminated mainly with chlorinated ethenes and perchlorate.

1.1 Treatment Configuration

The process flow diagram for the GWTP is presented in **Appendix A, Figure A-2**. The GWTP was not operational between 24 May 2012, and 6 September 2012, due to malfunction of the scrubber unit associated with the catalytic oxidizer. Since 6 September 2012, the GWTP has operated without air abatement equipment. Although major repairs were conducted on the GWTP (e.g., replacement of level alarms, repair of the hydrochloric acid [HCl] tank, replacement of TK-650, replacement of malfunctioning valves and flow meters, replacement of metering pumps, repair or replacement of various system pumps, rust removal and repainting of various tanks, and replacement and repair of various extraction pumps, motors, and level switches), the GWTP treatment configuration has remained relatively unchanged. The only exception to this is that ion exchange vessels were installed in November 2018 following the fluidized bed reactor (FBR) to further remove perchlorate prior to discharging to the INF pond.

Malfunction of the blower on the air stripper (BL-340) on 14 September 2015, and on 17 September 2015, disrupted continuous extraction and routine operations of the GWTP, which lasted through 7 January 2016. Prior to this occurrence, the GWTP performed as designed and the GWTP was operated on an as needed basis (i.e., semi-continuous operational basis). During the 4th quarter of 2015, groundwater was extracted from a limited number of ICTs (ICTs 12E, 13A, 13B, 13C, and/or 13E, or ICTs 14B, 14C, and 14D). Operation of the GWTP occurred on a batch basis through the FBR. After replacement of the blower, attempts were made to restore continuous operations to the FBR but remained predominantly on a batch basis throughout January 2016.

In December 2016, an HCl spill caused plant operations to shut down until the issue could be properly addressed. The FBR performance was challenged by the increased chlorides in the

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neutralized wastewater, but performance gradually returned to normal in the 1st quarter of 2017. Groundwater extraction was gradually increased to full rates during the 2nd quarter of 2017.

On 12 August 2017, severe storms caused a power outage at LHAAP-18/24. When electrical service was restored, the main transformer failed due to a manufacturing defect. A portable emergency generator was brought on-site on 21 August 2017, to allow the FBR to operate in full recycle mode. After a replacement transformer was installed on 12 September 2017, extraction began from ICT-13B, 13C, 13D, 13E, 13F, 7, and EW01 and the FBR was put into normal operation. Beginning on 21 September 2017, groundwater was extracted from all of the ICTs.

On 27 December 2018, severe storms caused a power outage in Karnack, Texas. When electrical service was restored, the main transformer was determined to have failed. A portable emergency generator was brought on-site on 28 December 2018, to allow the FBR to operate in full recycle mode. On 5 February 2019, the smaller generator mobilized in December 2018 was replaced with a larger generator capable of powering the LHAAP-18/24 well field and the entire GWTP. On 8 February 2019, the transformer at the GWTP was tested to ensure that it could handle backfeeding necessary to power the LHAAP-18/24 well field due to the necessary step-down in power from the generator. Following additional system modifications based upon the testing, the well field at LHAAP-18/24 had power restored on 11 February 2019, using the generator and transformer at the GWTP.

From 28 October through 31 October 2019, Palmetto Services was onsite to install new double walled pipe to 18WW17. The previous pipe had a leak and so the line had been stubbed off on 17 June 2019.

Flow rates for the treatment processes for metals and Volatile Organic Compounds (VOCs) ranged between 180 and 200 gallons per minute (gpm) with an average of approximately 190 gpm for the operating hours (i.e., this flow rate does not represent continuous flows). The GWTP operated for 131.75 hours during the quarter. The treatment configuration of the plant at these rates (with minor variations) is as follows:

GWTP Metals Precipitation Operating Parameters

Pretreatment Settings	Tank 200-A Mg(OH)₂ Mixing	Tank 200-B NaOH Mixing	Tank 200-C Polymer Mixing	Tank 300 feed line to Air Stripper
pH Adjustment	9.0	10.5	NA	5.0 to meet ≤ 8.0 release from stripper
Feed Pump Settings	Speed 100% Stroke 100% 10 gph Mg(OH) ₂	Speed 100% Stroke 100% 9.0 gph NaOH	Speed 90% Stroke 100% 40 gph water	Speed 80% Stroke 80% 10 gph HCl
Notes: gph - gallons per hour, NaOH - sodium hydroxide, Mg(OH) ₂ - magnesium hydroxide, NA - not applicable				

GWTP Air Compressors Operating Parameters

Air Compressors	K-700A	K-700B	K-701
Air Pressure Settings	88 psi	88 psi	105 psi
Note: psi - pounds per square inch			

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GWTP Stripper Operating Parameters

pH Setting	7.4
Inlet Pressure Gauge	Not operational
Stripper Pressure Gauge	Not operational
Air Flow Rate	Not operational

GWTP Fluidized Bed Reactor Operating Parameters

Carbon Bed Height	12 feet & 8 to 11 inches
Recycle Flow Rate	200 gpm
pH	7.1 to 7.4
Recycle oxidation-reduction potential (ORP)	<-430 mV
Note: mV – millivolts	

1.2 Work Performed at the GWTP

Work performed at the GWTP during the 4th quarter of 2019 is described in the following subsections.

1.2.1 Major Maintenance

The major maintenance items that were completed at the GWTP during this quarterly reporting period are:

- 1 October 2019: Bloc Design was onsite to repair electrical problems on some of the ICT wells
- 7 October 2019: The air-stripper blower stopped working; a new blower was procured
- 17 October 2019: Rogers Air Conditioning was onsite to service and repair air conditioning and heating units at the trailer
- 28 October through 31 October 2019: Palmetto Services was onsite to install new double walled pipe to 18WW17
- 11 November 2019: Bloc Design was onsite to disconnect wiring from the air stripper blower
- 18 November 2019: Bloc Design was onsite to reconnect wiring to the air stripper blower
- 19 November 2019: Bloc Design was onsite to adjust alarm on air flow from blower and also install a new alarm for TK-380 level
- 5 December 2019: Bloc Design was onsite to change the rotation on the air stripper blower due to incorrect labeling by the manufacturer
- 6 December 2019: Bloc Design was onsite to calibrate FIT-405

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1.2.2 Routine Maintenance

The following routine maintenance items were completed at the GWTP during this quarterly reporting period:

- Performed housekeeping in GWTP office
- Performed housekeeping in Army trailer
- Performed housekeeping around GWTP and containment area
- Performed housekeeping in GWTP Shop
- Mowed grass around directional signs
- Mowed grass around GWTP and Army Trailer
- Rebuilt Grundfos pumps
- Replaced leaking suction tubing on P-103 (nutrient feed pump)
- Installed new Woods #8 coupling on P-322
- Installed new gas powered sump pump

1.2.2.1 Safety

There were no safety activities conducted in the reporting period.

1.2.2.2 Lubrication

No lubrication maintenance was conducted during the reporting period.

1.2.2.3 Air Compressors

- Tightened belt on air compressor K-700B

1.2.2.4 Belt Press and Waste Disposal

No belt press or waste disposal was conducted during the reporting period.

1.2.2.5 Sand Filter

No maintenance or repairs were conducted on the sand filter during the reporting period.

1.2.2.6 Well Field at LHAAP-18/24

- Collected monthly water levels
- Cleaned level probes on ICTs 13B, 13C, 14E, and 12D
- Sampled wells at Site 18/24
- Bush hogged and weed ate around wells at Site 18/24

1.2.2.7 Miscellaneous Activities

- 30 November 2019: The acetic acid feed pump shut off; pump and FBR were restarted
- 25 December 2019: P-104 shut off and lost prime; P-104 was restarted and primed

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- 28 December 2019: Power glitch that caused the air compressors to shut down occurred; air compressors and FBR were restarted

1.2.3 Routine Maintenance at LHAAP-16

- None

1.2.4 Routine Maintenance (Potable Water Wells)

- Flushed potable water lines.

1.3 Filter Cake Operations and Management

No filter cake operations took place during this reporting period.

1.4 Fluidized Bed Reactor Operations

The operating parameters for the GWTP FBR are presented in **Table 1**. The few instances of when the operating parameters for either the ORP or pH were out of the optimum ranges are shaded below in grey. The ORP ranged between -426 mV and -493 mV, and the pH ranged between 7.0 and 7.4 standard units. The pH was out of optimum range one day only.

Table 1. Enhanced Fluidized Bed Reactor Operating Parameters – 4th Quarter 2019

Date	pH (7.1-7.4)	ORP (<-430 mV)	Temperature (Degrees Fahrenheit)
10/1/2019	7.3	-429	81
10/2/2019	7.3	-441	83
10/3/2019	7.3	-429	81
10/4/2019	7.3	-448	80
10/5/2019	7.3	-427	83
10/6/2019	7.3	-430	84
10/7/2019	7.3	-441	79
10/8/2019	7.3	-444	79
10/9/2019	7.3	-459	80
10/10/2019	7.2	-466	78
10/11/2019	7.2	-457	77
10/12/2019	7.2	-459	74
10/13/2019	7.1	-463	73
10/14/2019	7.1	-467	73
10/15/2019	7.1	-468	73
10/16/2019	7.1	-477	73
10/17/2019	7.2	-430	69
10/18/2019	7.3	-426	68
10/19/2019	7.2	-433	69
10/20/2019	7.3	-440	70

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Date	pH (7.1-7.4)	ORP (<-430 mV)	Temperature (Degrees Fahrenheit)
10/21/2019	7.2	-433	72
10/22/2019	7.1	-468	71
10/23/2019	7.1	-480	70
10/24/2019	7.2	-430	68
10/25/2019	7.2	-429	67
10/26/2019	7.2	-450	67
10/27/2019	7.1	-457	67
10/28/2019	7.1	-460	67
10/29/2019	7.1	-469	67
10/30/2019	7.0	-475	66
10/31/2019	7.4	-479	63
11/1/2019	7.3	-482	62
11/2/2019	7.2	-485	61
11/3/2019	7.2	-488	60
11/4/2019	7.4	-428	60
11/5/2019	7.4	-430	62
11/6/2019	7.3	-434	64
11/7/2019	7.3	-439	64
11/8/2019	7.3	-493	62
11/9/2019	7.2	-488	61
11/10/2019	7.1	-490	61
11/11/2019	7.2	-432	61
11/12/2019	7.3	-429	58
11/13/2019	7.3	-481	55
11/14/2019	7.3	-490	56
11/15/2019	7.3	-430	56
11/16/2019	7.3	-460	55
11/17/2019	7.2	-452	54
11/18/2019	7.2	-464	55
11/19/2019	7.4	-437	57
11/20/2019	7.4	-430	58
11/21/2019	7.4	-429	60
11/22/2019	7.4	-428	61
11/23/2019	7.3	-432	60
11/24/2019	7.3	-428	59
11/25/2019	7.3	-436	60
11/26/2019	7.4	-444	65
11/27/2019	7.4	-440	64

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Date	pH (7.1-7.4)	ORP (<-430 mV)	Temperature (Degrees Fahrenheit)
11/28/2019	7.4	-430	65
11/29/2019	7.3	-428	65
11/30/2019	7.3	-435	66
12/1/2019	7.3	-439	64
12/2/2019	7.3	-428	61
12/3/2019	7.3	-427	59
12/4/2019	7.2	-440	60
12/5/2019	7.2	-427	60
12/6/2019	7.2	-435	61
12/7/2019	7.2	-439	61
12/8/2019	7.2	-431	61
12/9/2019	7.2	-437	62
12/10/2019	7.1	-434	60
12/11/2019	7.1	-445	58
12/12/2019	7.1	-432	55
12/13/2019	7.1	-443	55
12/14/2019	7.1	-447	55
12/15/2019	7.1	-455	57
12/16/2019	7.1	-436	58
12/17/2019	7.1	-437	56
12/18/2019	7.1	-434	55
12/19/2019	7.2	-440	53
12/20/2019	7.2	-439	53
12/21/2019	7.1	-442	56
12/22/2019	7.1	-437	54
12/23/2019	7.2	-455	54
12/24/2019	7.2	-429	55
12/25/2019	7.2	-441	56
12/26/2019	7.2	-432	57
12/27/2019	7.2	-454	57
12/28/2019	7.2	-440	57
12/29/2019	7.2	-435	58
12/30/2019	7.3	-447	58
12/31/2019	7.3	-443	57

1.5 Process Chemical Usage at GWTP

Approximate chemical consumption and the quantity delivered during the 4th quarter of 2019 are shown in **Table 2**.

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Table 2. Chemical Usage and Delivery Table

Chemical	Usage 4th Quarter 2019	Quantity Delivered 4th Quarter 2019
Hydrochloric acid	325 gallons	0
Sodium hydroxide (35%)	650 gallons	0
Acetic acid (50%)	1 1/4 drums = 70 gallons	0
Phosphoric acid (75%)	16.0 liters	0
Magnesium hydroxide	160 gallons	0
Urea	117.8 pounds	0
Polymer (magnafloc 110-L)	6.8 liters	0

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2 EVALUATION OF LHAAP-18/24 ICT EFFECTIVENESS

The ICT system at Burning Ground No. 3 is composed of 14 sections ranging in length from 100 feet (ft) to 1,300 ft. A total of approximately 5,000 linear ft of trench was installed within and around three sides of Burning Ground No. 3. The trench sections extend approximately 22 ft to 45 ft below ground surface (bgs). Most, but not all of the trenches are as deep as the confining clay layer of the shallow groundwater zone. High density polyethylene (HDPE) liners were installed in ICTs 12 and 13, located on the western and northern boundaries of LHAAP-18/24, respectively. The locations of the liners are shown on **Figure A-1** in **Appendix A**. **Table A-1** in **Appendix A** presents the depths of the ICTs.

2.1 Groundwater Elevation

Water levels from 94 monitoring wells and 11 piezometers (piezometer 12 was damaged and plugged and abandoned in May 2013) are measured monthly to generate potentiometric surface maps that assist in monitoring the effectiveness of the groundwater extraction system on plume containment. The groundwater contours are generated using the water levels from the shallow zone and Wilcox Formation wells. The water level data are presented in **Table 3**. No reinjection of treated groundwater or reapplication to LHAAP-18/24 grounds via the existing irrigation system occurred during the 4th quarter of 2019. Potentiometric surface maps are presented in **Appendix B** and groundwater elevations from the 4th quarter of 2019 are discussed in Section 2.2.

2.2 Performance of Plume Capture

The intent of the ICTs is to control groundwater gradients, prevent off-site migration of contaminated groundwater, extract the most highly contaminated groundwater, and reduce the mass of contaminants in groundwater. Liners were installed in the ICTs on the northern (ICT 13) and western (ICT 12) site boundaries to limit migration of contaminated water from the site towards Harrison Bayou. At the same time, the liners reduce or prevent removal of contaminated groundwater that is outside the containment zone, between the site and Harrison Bayou. The ICTs are installed within the shallow subsurface at the site and capture primarily shallow groundwater (e.g., < 40 ft bgs).

In 2007 and 2008, in consultation with the Texas Commission on Environmental Quality (TCEQ) and the United States Environmental Protection Agency (USEPA), the Army ceased operations of ICTs 1, 3, 5, 10, 12A and 13G for groundwater extraction (note that extraction from ICT 12A was resumed after pump replacement in December 2012). Two other ICTs (ICT 6 and ICT 9) were changed from extraction ICTs to re-injection ICTs which ceased in July 2012. Groundwater extraction from well EW-1 located in the northeast central portion of the site began in October 2008 and well 18WW17 located to the northeast of the ICT containment area began in January 2008. **Table B-1** in **Appendix B** presents a summary of extraction equipment replacement since 2011, as dictated by poor extraction performance (malfunctioning pumps, poor pump positioning with respect to groundwater, non-operational level probes, scale build up, etc.). Further

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discussion of extraction performance of various ICTs and extraction wells is presented in Section 2.3.

Potentiometric surface maps of the shallow zone groundwater in the vicinity of LHAAP-18/24, based on groundwater elevations measured on 29 October, 25 November, and 26 December 2019, are shown on **Figures B-1, B-2, and B-3 in Appendix B**, respectively. The potentiometric surface maps of the shallow zone were contoured using the Kriging geostatistical interpolation method included in the Golden Software Surfer® data analysis software.

The HDPE liners in the ICTs, where present, were interpreted as groundwater flow barriers. The potentiometric surface maps for October through December 2019 continue to reflect high groundwater elevations in the northern/northwestern portion of the site with groundwater flow occurring radially from groundwater highs at monitoring well AWD-2 (174.88 ft above mean sea level [amsl] in October 2019, 174.75 ft amsl in November 2019, and 173.90 ft amsl in December 2019) inside the ICT containment area.

The elevated potentiometric surface contours within the ICTs compared to the lower potentiometric surface contours on the outside of the ICTs is likely due to a no flow boundary condition caused by the ICT liners and groundwater extraction along the ICTs. From the groundwater high at monitoring well AWD-2, groundwater flows radially towards the surrounding ICTs which include ICT 13 to the north and northwest, and ICT 12 to the west and southwest.

Groundwater extraction volumes from the ICTs were 368,656 gallons in October 2019; 409,924 gallons in November 2019; and 465,738 gallons in December 2019. Rainfall amounts recorded at the GWTP were 9.08 inches in October 2019, 1.31 inches in November 2019, and 1.95 inches in December 2019. This amount of rainfall resulted in over 95,527 gallons of additional water treated and discharged but not metered with the influent totals.

During the reporting period, approximately 433,751 gallons of treated groundwater was discharged to Harrison Bayou from the GWTP. No water was released from the INF pond to the Harrison Bayou. No treated groundwater from the GWTP was returned to LHAAP-18/24 via the sprinkler system. A total of 458,556 gallons was released to the INF Pond from the GWTP in the 4th quarter 2019. **Table 4** presents the daily discharge rates and volume for the 4th quarter of 2019. Overall groundwater levels increased throughout the 4th quarter of 2019.

Groundwater levels in Wilcox Formation wells (generally > 40 to 50 ft bgs) were measured during the 4th quarter of 2019 groundwater gauging events. Wilcox Formation wells correspond generally to those wells previously identified as “Intermediate” and “Deep” wells. “Intermediate” wells are designated as Upper Wilcox Formation wells and “Deep” wells are designated as Lower Wilcox Formation wells. Generally, groundwater in the Upper and Lower Wilcox Formation wells are in hydraulic communication and so can be treated as a single hydrogeologic unit. Therefore, the groundwater elevations in Upper Wilcox wells were used to construct the potentiometric surface maps for the Wilcox Formation. **Figures B-4, B-5, and B-6 in Appendix B** show the locations of the Wilcox Formation monitoring wells and the potentiometric surface of the Wilcox Formation, based on static water levels measured during the October, November, and December 2019 gauging events, respectively. Groundwater in the

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Wilcox Formation generally flows in a northerly direction, towards Caddo Lake and there is a downward vertical gradient between the overlying shallow zone and the Wilcox Formation. However, a groundwater high in the Wilcox Formation occurs in the area of MW-14.

2.3 Quantity of Water Extracted from LHAAP-18/24

The average daily extraction rates from the ICTs were 11,892 gallons per day (gpd) in October 2019, approximately 13,223 gpd in November 2019, and approximately 15,525 gpd in December 2019.

The volume of groundwater removed from LHAAP-18/24 during the 4th quarter of 2019 measured approximately 1,244,318 gallons, based on total flow measured from the extraction wells and ICT wells. Groundwater was not extracted from LHAAP-16 during the 4th quarter of 2019 because injections commenced as part of the final remedial action. Extraction from LHAAP-16 is no longer occurring. **Figure 2-1** shows the historical trends of extracted volumes by quarter.

In contrast to the approximate total extracted volume based on total flow measured at the GWTP, the total estimated volume discharged to the INF pond and/or Harrison Bayou (**Table 4**) following treatment by the GWTP was 270,515 gallons in October 2019; 266,660 gallons in November 2019; and 355,132 gallons in December 2019 for a total of 892,307 gallons discharged in the 4th quarter of 2019. The difference between the influent and effluent volumes is approximately 30%. However, considering the over 363,905 gallons of water within the treatment plant as of December 30, 2019, this percent difference is closer to 1% variation, which is contributable to variations in the influent flow meter recordings and evaporative losses. The repairs to the double-walled distribution lines from LHAAP-18/24 have increased the influent flow.

As indicated by **Table 5**, 15 of 27 ICTs and wells produced water for the entirety of the 4th quarter of 2019. Well 18WW17 did not produce water in October as the line was shut down, but did for the remainder of the quarter. ICTs 14D and 14B did not produce water in October. EW-01 only produced water in November. ICT 13E did not produce water in November and ICT 13D did not produce water in December.

2.4 Sampling Activities at LHAAP-18/24

Groundwater sampling was completed at LHAAP-18/24 in accordance with the requirements documented in the Final Revised Installation-Wide Work Plan (Bhate Environmental Associates, Inc. [Bhate], May 2018). The following 54 monitoring wells were sampled for the 4th quarter 2019: AWD-1, AWD-3, AWD-4, MW-2, MW-3, MW-5, MW-7, MW-8, MW-9, MW-10, MW-14, MW-16, MW-17, MW-18, MW-19, MW-20, MW-21, MW-22, MW-23, 109, 120, 125, 126, C-03, C-08, C-09, 18WW02, 18WW06, 18WW08, 18WW10, 18WW17, 18WW22, 18WW24, 18CPTMW01SW, 18CPTMW03SW, 18CPTMW04, 18CPTMW04SW, 18CPTMW06, 18CPTMW07, 18CPTMW08SW, 18CPTMW08DW, 18CPTMW10SW, 18CPTMW10DW, 18CPTMW12SW, 18CPTMW12DW, 18CPTMW14, 18CPTMW15, 18CPTMW16, 18CPTMW18, 18CPTMW19, 18CPTMW22SW, 18CPTMW22R, 18CPTMW23, and 18CPTMW24. These were all sampled between 5 December and 17 December 2019.

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The analytical results are presented in **Table 6**. Laboratory data packages are provided within **Appendix C**. Parameters exceeding their respective Maximum Contaminant Levels (MCLs), Medium Specific Concentrations (MSCs), or Protective Concentration Levels (PCLs) are as follows: perchlorate; 1,1,2-trichloroethane; 1,1-dichloroethene (DCE); 1,2-dichloroethane; benzene; carbon tetrachloride; cis-1,2-DCE; methylene chloride; trichloroethene (TCE); vinyl chloride (VC); arsenic; barium; chromium; manganese; nickel; and 1,4-dioxane.

Groundwater chemicals of concern (COCs) maps depicting the results of the December 2019 groundwater sampling event for perchlorate, TCE, and methylene chloride are presented as **Figures D-1 through D-6** in **Appendix D**.

2.4.1 LHAAP-18/24 Analytical Results

The highest perchlorate concentrations in the shallow zone are observed in MW-23, MW-5, MW-7, MW-21, 18WW17, 120, and MW-3, with concentrations in these wells ranging between 13,000 micrograms per liter ($\mu\text{g/L}$) in MW-21 and 80,000 $\mu\text{g/L}$ in MW-23 (**Figure D-1**). Perchlorate in groundwater has migrated off-site in all directions. The perchlorate concentration in 18CPTMW23, which is located northwest just outside of the LHAAP-18/24 boundary, was reported at 73 $\mu\text{g/L}$. The perchlorate concentration was 2,500 $\mu\text{g/L}$ in June 2019 and 4,200 $\mu\text{g/L}$ in December 2018. The December detections are regularly orders of magnitude lower due to decreased rainfall. The elevated concentration from December 2018 was most likely due to higher rainfall amounts over the previous 9 months. Historical data demonstrates the more typical fluctuation with measurements of perchlorate as follows: 140 $\mu\text{g/L}$ in December 2017, 3,220 $\mu\text{g/L}$ in June 2017, 91.3 $\mu\text{g/L}$ in December 2016, and 2,310 $\mu\text{g/L}$ in June 2016. These changes in concentration are likely influenced by groundwater level fluctuations, rain amounts, and performance of the ICTs.

Perchlorate in the Wilcox Formation was detected in monitoring well 18CPTMW08SW at a concentration of 24,000 $\mu\text{g/L}$ (**Figure D-2**), which is comparable to the concentration reported in June 2019 (23,000 $\mu\text{g/L}$) and similar to the December 2018 concentration of 22,000 $\mu\text{g/L}$. Perchlorate concentration decreases rapidly away from this well. Another area where perchlorate in the Wilcox Formation was identified at an elevated concentration is in MW-14, with a reported concentration of 130,000 $\mu\text{g/L}$ which is almost 50% less than the detections of 240,000 $\mu\text{g/L}$ (primary sample)/230,000 $\mu\text{g/L}$ (duplicate) in June 2019. Monitoring well 18CPTMW22SW contained a slightly elevated concentration of perchlorate at 33 $\mu\text{g/L}$, which is far less than the detection of 590 $\mu\text{g/L}$ in June 2019 and historical detections in this monitoring well.

The highest December 2019 TCE detection was 9,200 $\mu\text{g/L}$ in monitoring well 120 (**Figure D-3**). In June 2019, monitoring well 120 had a concentration of 7,900 $\mu\text{g/L}$. This is a marked decrease compared to the June 2018 concentration of 17,000 $\mu\text{g/L}$ and the December 2018 concentration of 22,000 $\mu\text{g/L}$. This observed fluctuation of TCE within well 120 is likely due to fluctuations in groundwater elevations and rainfall amounts.

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TCE in the Wilcox Formation is generally present at low concentrations (**Figure D-4**). However, the highest concentration of 9,200 µg/L in December 2019 was observed in MW-14. This concentration slightly decreased from a concentration of 11,000 µg/L in June 2019. The previous year the comparable December 2018 concentration was 9,000 µg/L and June 2018 reported 7,300 µg/L. A concentration of 64 µg/L was reported in December 2019 in 18CPTMW01SW, double the concentration of 32 µg/L in June 2019, which are both below what was measured in December 2018 (76 µg/L).

The elevated concentration of methylene chloride in the shallow zone remains centered on MW-2 with a concentration of 42,000 µg/L in December 2019. The concentrations of methylene chloride in MW-2 have fluctuated since June 2017. The extent of methylene chloride in the shallow formation is depicted on **Figure D-5**.

Methylene chloride in the Wilcox Formation is present in 18CPTMW01SW at a December 2019 concentration of 10 µg/L which is lower than the concentration of 100 µg/L reported in June 2019 and of 1,600 µg/L in December 2018. This fluctuation could be due in part to the large amount of rainfall that occurred during the fall/winter of 2018 and the lack of rainfall in November and December of 2019. Methylene chloride in MW-14 was not detected in December 2019, June 2019, December 2018, or June 2018. The extent of methylene chloride in the Wilcox Formation is depicted on **Figure D-6**.

2.4.2 LHAAP-18/24 Trend Analysis

Time-series graphs for the shallow zone and Wilcox Formation wells are presented in **Appendix E**. Graphs for shallow zone wells C-08, MW-2, MW-7, MW-8, MW-16, MW-17, MW-20, MW-21, MW-22, MW-23, 18WW08, 109, 120, 126, and AWD-3 are included. Graphs for Wilcox wells C-03 and MW-14 are also included. The following observations were made, based on the December 2019 groundwater monitoring results:

- MW-2 is located inside the containment in the shallow zone. Methylene chloride significantly decreased to 42,000 µg/L in December 2019 compared to a detection of 510,000 µg/L in June 2019 and a detection of 170,000 µg/L in December 2018. The TCE concentration in December 2019 increased to 4,800 µg/L from a June 2019 concentration of 1,400 µg/L and 2,300 µg/L in December 2018. Perchlorate was non-detect in December 2019 as well as in June 2019 and December 2018.
- The perchlorate concentration in MW-21 decreased in December 2019 with a detection of 13,000 µg/L compared to June 2019 with a detection of 24,000 µg/L and 23,000 µg/L in December 2018. TCE in MW-21 decreased further to 3,200 µg/L in December 2019 from 6,300 µg/L in June 2019 and from 9,800 µg/L in December 2018. Methylene chloride remained below the detection limit.
- The TCE concentration in MW-22 was comparable in December 2019 (240 µg/L) to June 2019 (230 µg/L) and almost three-fold lower than the December 2018 result of 680 µg/L. Methylene chloride remained below the detection limit. Perchlorate was

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elevated with a concentration of 210 µg/L in December 2019 compared to a detection of 95 µg/L in June 2019 and a detection of 84 µg/L in December 2018.

- Perchlorate detected in groundwater at MW-23 is on an increasing trend with a concentration of 80,000 µg/L in December 2019 from 67,000 µg/L in June 2019, and 52,000 µg/L in December 2018. TCE increased slightly to 3,000 µg/L from 2,600 µg/L in June 2019 and 4,800 µg/L in December 2018.
- Perchlorate in monitoring well 120 decreased from 47,000 µg/L in December 2018 to 13,000 µg/L in June 2019 and rose again to 23,000 µg/L in December 2019. TCE also decreased from 22,000 µg/L in December 2018 to 7,900 µg/L in June 2019 and rose to 9,200 µg/L in December 2019.
- Methylene chloride and perchlorate remained below the detection limits in C-08, to the northeast of the containment area. TCE remained stable with a December 2019 concentration of 2.0 µg/L compared to 1.1 µg/L in June 2019 and 2.2 µg/L in December 2018.
- The northeastern well, 109, saw a decrease of perchlorate to 1,000 µg/L in December 2019 from 10,000 µg/L in June 2019 and the December 2018 detection of 3,200 µg/L. TCE increased to 400 µg/L in December 2019 compared to 130 µg/L in June 2019 but was similar to the concentration of 420 µg/L in December 2018. Methylene chloride remained below the detection limit.
- Wells to the southwest of the containment area include MW-7, MW-8, and MW-17. Perchlorate slightly decreased in MW-7 to 25,000 µg/L in December 2019 from 26,000 µg/L in June 2019. This well has seen an upward swing in TCE from the June 2019 sampling event (1,300 µg/L) to 3,200 µg/L in December 2019. Perchlorate decreased in MW-8 to 4,100 µg/L from 7,100 µg/L in June 2019. TCE in MW-8 was relatively stable with a detection of 180 µg/L in December 2019 compared to 120 µg/L in June 2019. The perchlorate concentration in MW-17 has remained below the detection limit since June 2016. Methylene chloride remained below the detection limit in both MW-7 and MW-8 and is not analyzed for in MW-17.
- Perchlorate in MW-16 significantly decreased to 1.8 J (estimated value) µg/L from 2,900 µg/L in June 2019. TCE also decreased to 550 µg/L from a concentration of 1,200 µg/L in June 2019. This variability in the TCE detection has been observed since 2014. Methylene chloride remained below the detection limit.
- Perchlorate in AWD-3 increased from 1.8 J µg/L in June 2019 to 32 µg/L in December 2019. Inversely, TCE decreased from 580 µg/L in June 2019 to 230 µg/L in December 2019. Methylene chloride remained below the detection limit.
- C-03 is a Wilcox Formation well located northeast of the containment area, which has remained non-detect for TCE and methylene chloride since December 2014. Perchlorate decreased to 15 µg/L in December 2019 from 54 µg/L in June 2019.

- The current concentration of perchlorate in Wilcox Formation well MW-14 decreased to 130,000 µg/L in December 2019 from 240,000 µg/L in June 2019. The concentration of TCE also decreased to 9,200 µg/L in December 2019 from 11,000 µg/L in June 2019. Methylene chloride remained below the detection limit.
- The concentration of methylene chloride continues to be non-detect in 18WW08. Perchlorate and TCE increased from non-detects in June 2019 to 3,200 µg/L and 3.2 µg/L, respectively in December 2019. The water level dropped nearly 3 ft in the 4th quarter to 167.77 ft amsl. The water level was also more than 4 ft lower than in June 2019 when there were non-detect results for 18WW08. In December 2017, the water elevation was even lower than in December 2019 (165.48 ft amsl) and TCE and perchlorate were detected at 4.7 µg/L and 2,400 µg/L, respectively. Therefore, the concentration in monitoring well 18WW08 appears to be directly influenced by groundwater levels.

Monitoring wells MW-20 and 126 continue to have no detections of methylene chloride, TCE, and perchlorate. These wells confirm that the plume is delineated to the south.

In general, other than the changes observed above in perchlorate, TCE, and methylene chloride concentrations, the COC concentration trends indicate that the plumes are stable, suggesting that the extraction system is effective in containing the plumes.

2.5 Groundwater Treatment Plant Sampling and Analysis

Sampling and analysis is completed in accordance with the requirements documented in the Final Revised Sampling and Analysis Plan (AECOM Technical Services, Inc., September 2017). Besides the Record of Decision (ROD) sampling requirement, additional sample analyses are typically performed on the influent and effluent samples to monitor the effectiveness of the perchlorate treatment (FBR and/or ion exchange vessels) process. Sections 2.5.1 through 2.5.4 present the results of analyses conducted during the 4th quarter of 2019. The complete laboratory results are provided on a compact disc (CD) (**Appendix F**).

2.5.1 Perchlorate Sampling

Table 7 presents the weekly effluent perchlorate results for the 4th quarter of 2019. Low levels of perchlorate were present in some of the effluent samples collected during the 4th Quarter 2019 but they did not exceed the screening criteria.

2.5.2 VOC Sampling

Tables 8, 9, and 10 present the effluent VOC results for October, November, and December 2019. Sampling of the effluent for VOCs was conducted on a biweekly basis. The results, when discharged to the Bayou, were below the discharge limits. The biweekly effluent results for methylene chloride and TCE exceeded the screening criteria for discharge to the INF Pond on 26 November 2019 and the monthly effluent result for TCE also exceeded the INF Pond criteria on 3 December 2019. Additional samples were collected on 4 December 2019 to evaluate the Ion Exchange Vessel's ability to remove these contaminants after the rotation of the air stripper blower was changed to correct the improper orientation by the manufacturer. The tables also provide monthly influent concentrations for VOCs and perchlorate.

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2.5.3 Monthly Metals Sampling

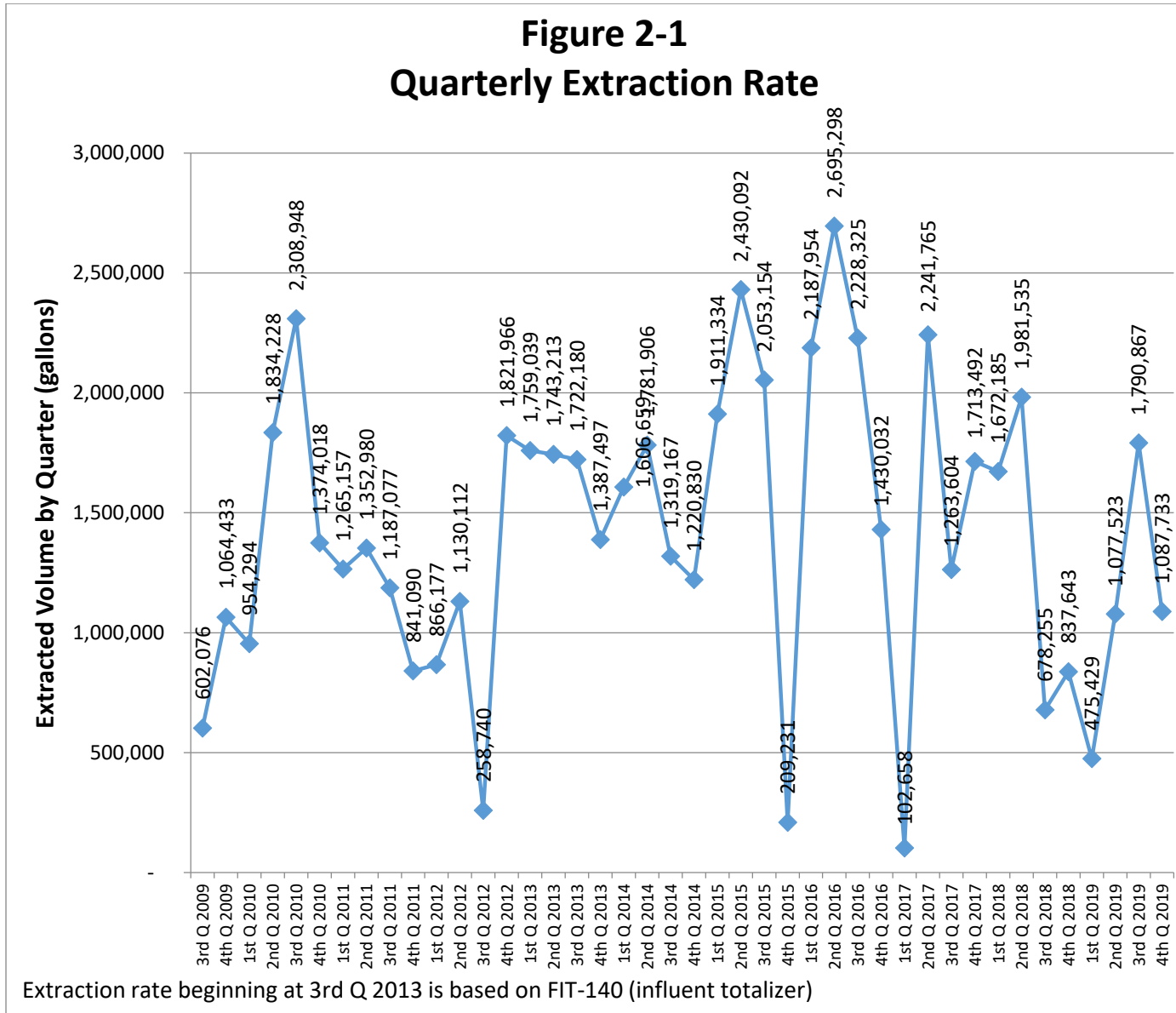
As per the Final Installation-Wide Work Plan (Bhate, May 2018), the monthly metals sampling is reported in **Tables 8, 9, and 10**. None of the metals exceeded the effluent discharge limits.

2.5.4 Quarterly Sampling

Sampling of the effluent for VOCs, anions, chemical oxygen demand (COD), oil and grease, perchlorate, and metals was conducted during this quarter and the results were below the discharge limits. **Table 11** presents the analytical results for the 4th quarter of 2019.

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**Figure 2-1
 Quarterly Extraction Rate**



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Table 3: Groundwater Elevations at LHAAP-18/24 Piezometers, Monitoring Wells, and Surface Water

Location Identification	Type	Reference Elevation (feet amsl)	Depth to Water (feet) 10/29/2019	Groundwater Elevation (feet amsl) 10/29/2019	Depth to Water (feet) 11/25/2019	Groundwater Elevation (feet amsl) 11/25/2019	Depth to Water (feet) 12/26/2019	Groundwater Elevation (feet amsl) 12/26/2019
BGPZ-1	Piezometer	184.99	7.00	177.99	7.51	177.48	9.09	175.90
BGPZ-2	Piezometer	184.39	12.91	171.48	13.03	171.36	14.45	169.94
BGPZ-3	Piezometer	180.35	7.20	173.15	7.32	173.03	9.02	171.33
BGPZ-4	Piezometer	177.77	6.89	170.88	6.99	170.78	8.77	169.00
BGPZ-5	Piezometer	180.76	10.80	169.96	10.91	169.85	12.09	168.67
BGPZ-6	Piezometer	197.82	26.85	170.97	26.96	170.86	27.55	170.27
BGPZ-7	Piezometer	195.96	26.55	169.41	26.63	169.33	27.28	168.68
BGPZ-8	Piezometer	197.08	28.62	168.46	28.70	168.38	29.39	167.69
BGPZ-9	Piezometer	196.45	27.07	169.38	27.19	169.26	28.02	168.43
BGPZ-10	Piezometer	197.00	27.21	169.79	27.30	169.70	28.20	168.80
BGPZ-11	Piezometer	196.99	27.37	169.62	27.48	169.51	28.37	168.62
BGPZ-12	Piezometer	188.17	NA	Plugged	NA	Plugged	NA	Plugged
AWD-1	Monitoring Well	182.27	8.36	173.91	8.45	173.82	10.79	171.48
AWD-2	Monitoring Well	186.78	11.90	174.88	12.03	174.75	12.88	173.90
AWD-3	Monitoring Well	200.13	27.00	173.13	27.15	172.98	28.39	171.74
AWD-4	Monitoring Well	193.89	20.19	173.70	20.30	173.59	23.25	170.64
MW-1	Monitoring Well	199.22	26.12	173.10	26.23	172.99	27.55	171.67
MW-2	Monitoring Well	196.73	25.70	171.03	25.78	170.95	27.19	169.54
MW-3	Monitoring Well	196.54	25.22	171.32	25.30	171.24	26.80	169.74
MW-4	Monitoring Well	197.27	25.54	171.73	25.65	171.62	26.97	170.30
MW-5	Monitoring Well	194.97	23.20	171.77	23.31	171.66	25.28	169.69
MW-6	Monitoring Well	192.18	20.99	171.19	21.09	171.09	23.01	169.17
MW-7	Monitoring Well	188.47	17.50	170.97	17.63	170.84	18.80	169.67

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Location Identification	Type	Reference Elevation (feet amsl)	Depth to Water (feet) 10/29/2019	Groundwater Elevation (feet amsl) 10/29/2019	Depth to Water (feet) 11/25/2019	Groundwater Elevation (feet amsl) 11/25/2019	Depth to Water (feet) 12/26/2019	Groundwater Elevation (feet amsl) 12/26/2019
MW-8	Monitoring Well	187.13	15.25	171.88	15.30	171.83	15.45	171.68
MW-9	Monitoring Well	184.73	12.70	172.03	12.79	171.94	14.42	170.31
MW-10	Monitoring Well	178.12	7.18	170.94	7.30	170.82	9.00	169.12
MW-11	Monitoring Well	184.65	13.68	170.97	13.81	170.84	15.27	169.38
MW-12	Monitoring Well	178.33	7.20	171.13	7.27	171.06	8.44	169.89
MW-13	Monitoring Well	176.72	6.60	170.12	6.71	170.01	7.59	169.13
MW-14	Monitoring Well	186.19	12.01	174.18	12.15	174.04	13.65	172.54
MW-16	Monitoring Well	178.59	7.28	171.31	7.40	171.19	9.50	169.09
MW-17	Monitoring Well	179.03	8.01	171.02	8.20	170.83	10.05	168.98
MW-18	Monitoring Well	178.58	7.49	171.09	7.60	170.98	9.00	169.58
MW-19	Monitoring Well	178.60	7.80	170.80	7.93	170.67	8.63	169.97
MW-20	Monitoring Well	186.64	9.29	177.35	9.35	177.29	12.07	174.57
MW-21	Monitoring Well	198.70	30.20	168.50	30.33	168.37	30.51	168.19
MW-22	Monitoring Well	197.51	27.92	169.59	28.04	169.47	27.72	169.79
MW-23	Monitoring Well	198.79	27.82	170.97	27.94	170.85	27.65	171.14
101	Monitoring Well	197.53	7.71	189.82	7.95	189.58	8.87	188.66
102	Monitoring Well	193.94	18.87	175.07	18.96	174.98	20.12	173.82
109	Monitoring Well	197.02	28.21	168.81	28.32	168.70	28.43	168.59
120	Monitoring Well	184.19	11.20	172.99	11.30	172.89	13.85	170.34
123	Monitoring Well	186.21	12.47	173.74	12.59	173.62	13.75	172.46
125	Monitoring Well	196.28	22.98	173.30	23.10	173.18	25.03	171.25
126	Monitoring Well	199.37	29.13	170.24	29.20	170.17	29.18	170.19
129	Monitoring Well	197.24	25.28	171.96	25.39	171.85	26.17	171.07
130	Monitoring Well	177.73	6.96	170.77	7.11	170.62	8.08	169.65
C-01	Monitoring Well	193.89	23.10	170.79	23.23	170.66	24.29	169.60

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Location Identification	Type	Reference Elevation (feet amsl)	Depth to Water (feet) 10/29/2019	Groundwater Elevation (feet amsl) 10/29/2019	Depth to Water (feet) 11/25/2019	Groundwater Elevation (feet amsl) 11/25/2019	Depth to Water (feet) 12/26/2019	Groundwater Elevation (feet amsl) 12/26/2019
C-02	Monitoring Well	175.95	5.71	170.24	5.90	170.05	6.73	169.22
C-03	Monitoring Well	196.34	25.51	170.83	25.64	170.70	27.00	169.34
C-04	Monitoring Well	194.64	23.59	171.05	23.70	170.94	24.59	170.05
C-04A	Monitoring Well	194.61	23.38	171.23	23.51	171.10	24.27	170.34
C-05	Monitoring Well	180.74	11.41	169.33	11.53	169.21	12.30	168.44
C-06	Monitoring Well	192.22	23.77	168.45	23.89	168.33	24.83	167.39
C-07	Monitoring Well	196.80	26.97	169.83	27.12	169.68	28.07	168.73
C-08	Monitoring Well	193.10	24.40	168.70	24.52	168.58	23.73	169.37
C-09	Monitoring Well	202.35	32.68	169.67	32.75	169.60	32.21	170.14
C-10	Monitoring Well	201.86	31.90	169.96	31.98	169.88	31.77	170.09
17WW08	Monitoring Well	179.72	9.54	170.18	9.65	170.07	10.37	169.35
18WW01	Monitoring Well	201.31	31.00	170.31	31.14	170.17	31.30	170.01
18WW02	Monitoring Well	179.30	8.70	170.60	8.81	170.49	9.82	169.48
18WW03	Monitoring Well	195.59	25.81	169.78	25.95	169.64	26.69	168.90
18WW04	Monitoring Well	183.74	15.20	168.54	15.31	168.43	16.03	167.71
18WW05	Monitoring Well	189.59	20.00	169.59	20.21	169.38	21.17	168.42
18WW06	Monitoring Well	179.70	9.50	170.20	9.63	170.07	10.62	169.08
18WW07	Monitoring Well	183.67	NM	NM	NM	NM	NM	NM
18WW08	Monitoring Well	177.77	7.27	170.50	7.35	170.42	10.00	167.77
18WW09	Monitoring Well	177.51	7.53	169.98	7.66	169.85	10.33	167.18
18WW10	Monitoring Well	182.26	10.90	171.36	10.99	171.27	13.88	168.38
18WW11	Monitoring Well	182.29	12.40	169.89	12.51	169.78	14.20	168.09
18WW14	Monitoring Well	186.47	15.36	171.11	15.50	170.97	15.88	170.59
18WW15	Monitoring Well	186.24	15.02	171.22	15.18	171.06	15.42	170.82
18WW16	Monitoring Well	201.88	32.50	169.38	32.57	169.31	32.71	169.17

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Location Identification	Type	Reference Elevation (feet amsl)	Depth to Water (feet) 10/29/2019	Groundwater Elevation (feet amsl) 10/29/2019	Depth to Water (feet) 11/25/2019	Groundwater Elevation (feet amsl) 11/25/2019	Depth to Water (feet) 12/26/2019	Groundwater Elevation (feet amsl) 12/26/2019
18WW18	Monitoring Well	196.82	26.39	170.43	26.50	170.32	27.43	169.39
18WW19	Monitoring Well	179.56	11.53	168.03	11.64	167.92	12.22	167.34
18WW20	Monitoring Well	180.42	12.28	168.14	12.31	168.11	13.05	167.37
18WW21	Monitoring Well	195.20	25.50	169.70	25.64	169.56	26.19	169.01
18WW22	Monitoring Well	195.37	24.69	170.68	24.78	170.59	26.32	169.05
18WW24	Monitoring Well	176.40	6.04	170.36	6.25	170.15	9.27	167.13
18WW25	Monitoring Well	175.15	5.79	169.36	5.96	169.19	8.89	166.26
18CPTMW01SW	Monitoring Well	198.20	26.37	171.83	26.49	171.71	27.87	170.33
18CPTMW01DW	Monitoring Well	197.92	27.60	170.32	27.75	170.17	28.50	169.42
18CPTMW03SW	Monitoring Well	198.53	27.95	170.58	28.08	170.45	29.34	169.19
18CPTMW04	Monitoring Well	196.60	23.12	173.48	23.22	173.38	24.87	171.73
18CPTMW04SW	Monitoring Well	196.42	25.64	170.78	25.77	170.65	27.15	169.27
18CPTMW06	Monitoring Well	198.12	27.70	170.42	27.80	170.32	28.96	169.16
18CPTMW07	Monitoring Well	197.32	26.81	170.51	26.92	170.40	28.00	169.32
18CPTMW08SW	Monitoring Well	196.38	25.45	170.93	25.54	170.84	27.05	169.33
18CPTMW08DW	Monitoring Well	196.59	25.88	170.71	25.99	170.60	27.50	169.09
18CPTMW10SW	Monitoring Well	186.98	16.30	170.68	16.43	170.55	17.53	169.45
18CPTMW10DW	Monitoring Well	187.38	16.97	170.41	17.10	170.28	18.04	169.34
18CPTMW12SW	Monitoring Well	190.90	20.49	170.41	20.62	170.28	21.43	169.47
18CPTMW12DW	Monitoring Well	190.25	19.90	170.35	20.03	170.22	20.69	169.56
18CPTMW14	Monitoring Well	196.69	27.27	169.42	27.37	169.32	26.65	170.04
18CPTMW15	Monitoring Well	179.79	9.49	170.30	9.61	170.18	9.88	169.91
18CPTMW16	Monitoring Well	175.37	6.00	169.37	6.19	169.18	7.15	168.22
18CPTMW18	Monitoring Well	194.53	27.64	166.89	27.77	166.76	26.65	167.88
18CPTMW19	Monitoring Well	193.59	19.19	174.40	19.32	174.27	23.12	170.47

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Location Identification	Type	Reference Elevation (feet amsl)	Depth to Water (feet) 10/29/2019	Groundwater Elevation (feet amsl) 10/29/2019	Depth to Water (feet) 11/25/2019	Groundwater Elevation (feet amsl) 11/25/2019	Depth to Water (feet) 12/26/2019	Groundwater Elevation (feet amsl) 12/26/2019
18CPTMW19SW	Monitoring Well	193.29	22.35	170.94	22.47	170.82	24.21	169.08
18CPTMW22SW	Monitoring Well	187.79	17.77	170.02	17.85	169.94	18.52	169.27
18CPTMW22R	Monitoring Well	187.23	8.02	179.21	8.21	179.02	11.05	176.18
18CPTMW22DW	Monitoring Well	188.00	17.90	170.10	18.04	169.96	19.49	168.51
18CPTMW23	Monitoring Well	177.47	7.68	169.79	7.80	169.67	8.79	168.68
18CPTMW23SW	Monitoring Well	177.43	8.00	169.43	8.18	169.25	9.10	168.33
18CPTMW24	Monitoring Well	194.89	26.85	168.04	26.97	167.92	26.40	168.49
18CPTMW26	Monitoring Well	182.60	15.15	167.45	15.31	167.29	16.07	166.53
18CPTMW26SW	Monitoring Well	182.00	11.82	170.18	11.95	170.05	12.91	169.09
1824HBSW7	Surface Water Sample	167.92	1.62	166.30	1.45	166.47	3.00	164.92

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Table 4: Treated Groundwater Discharged –October through December 2019

Date	Harrison Bayou Flow (gpm)	Maximum Flow Allowed (gpm)	Released From GWTP To Harrison Bayou	Released From INF Pond to Harrison Bayou	Released From GWTP to INF Pond	Combined Total Released to Harrison Bayou	INF Pond Staff Reading (6.20 = 3 ft. Freeboard)
10/01/2019	NA	NA	0	0	17,719	0	4.17
10/02/2019	NA	NA	0	0	22,927	0	4.25
10/03/2019	NA	NA	0	0	20,169	0	4.32
10/04/2019	NA	NA	0	0	15,981	0	4.36
10/05/2019	NA	NA	0	0	0	0	4.39
10/06/2019	NA	NA	0	0	0	0	4.42
10/07/2019	NA	NA	0	0	66,127	0	4.45
10/08/2019	NA	NA	0	0	8,037	0	4.48
10/09/2019	NA	NA	0	0	14,050	0	4.55
10/10/2019	NA	NA	0	0	10,407	0	4.58
10/11/2019	NA	NA	0	0	0	0	4.62
10/12/2019	NA	NA	0	0	0	0	4.62
10/13/2019	NA	NA	0	0	0	0	4.61
10/14/2019	NA	NA	0	0	0	0	4.60
10/15/2019	NA	NA	0	0	10,324	0	4.75
10/16/2019	NA	NA	0	0	25,984	0	4.84
10/17/2019	NA	NA	0	0	18,729	0	4.91
10/18/2019	NA	NA	0	0	0	0	4.91
10/19/2019	NA	NA	0	0	0	0	4.90
10/20/2019	NA	NA	0	0	0	0	4.90
10/21/2019	NA	NA	0	0	2,186	0	5.02
10/22/2019	NA	NA	0	0	16,661	0	5.05
10/23/2019	NA	NA	0	0	14,882	0	5.10

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Date	Harrison Bayou Flow (gpm)	Maximum Flow Allowed (gpm)	Released From GWTP To Harrison Bayou	Released From INF Pond to Harrison Bayou	Released From GWTP to INF Pond	Combined Total Released to Harrison Bayou	INF Pond Staff Reading (6.20 = 3 ft. Freeboard)
10/24/2019	NA	NA	0	0	6,332	0	5.12
10/25/2019	NA	NA	0	0	0	0	5.20
10/26/2019	NA	NA	0	0	0	0	5.31
10/27/2019	NA	NA	0	0	0	0	5.31
10/28/2019	NA	NA	0	0	0	0	5.30
10/29/2019	NA	NA	0	0	0	0	5.30
10/30/2019	NA	NA	0	0	0	0	5.43
10/31/2019	NA	NA	0	0	0	0	5.71
11/01/2019	12,595	2,304	0	0	0	0	5.71
11/02/2019	10,679	1,954	0	0	0	0	5.71
11/03/2019	8,965	1,640	0	0	0	0	5.70
11/04/2019	7,877	1,441	40,572	0	0	40,572	5.70
11/05/2019	NA	NA	0	0	0	0	5.70
11/06/2019	NA	NA	0	0	0	0	5.69
11/07/2019	NA	NA	0	0	0	0	5.69
11/08/2019	3,083	564	1,689	0	0	1,689	5.69
11/09/2019	2,765	505	0	0	0	0	5.69
11/10/2019	2,498	457	0	0	0	0	5.68
11/11/2019	2,224	406	41,166	0	0	41,166	5.68
11/12/2019	NA	NA	0	0	0	0	5.68
11/13/2019	NA	NA	0	0	0	0	5.67
11/14/2019	NA	NA	0	0	0	0	5.67
11/15/2019	453	103	0	0	0	0	5.67
11/16/2019	387	88	0	0	0	0	5.67
11/17/2019	295	67	0	0	0	0	5.67

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Date	Harrison Bayou Flow (gpm)	Maximum Flow Allowed (gpm)	Released From GWTP To Harrison Bayou	Released From INF Pond to Harrison Bayou	Released From GWTP to INF Pond	Combined Total Released to Harrison Bayou	INF Pond Staff Reading (6.20 = 3 ft. Freeboard)
11/18/2019	259	59	32,076	0	0	32,076	5.66
11/19/2019	NA	NA	0	0	0	0	5.66
11/20/2019	NA	NA	0	0	27,827	0	5.73
11/21/2019	NA	NA	0	0	2,447	0	5.81
11/22/2019	NA	NA	0	0	15,566	0	5.85
11/23/2019	NA	NA	0	0	0	0	5.88
11/24/2019	NA	NA	0	0	0	0	5.92
11/25/2019	NA	NA	0	0	48,042	0	5.96
11/26/2019	NA	NA	0	0	13,074	0	5.98
11/27/2019	NA	NA	0	0	10,104	0	6.00
11/28/2019	NA	NA	0	0	0	0	6.03
11/29/2019	NA	NA	0	0	0	0	6.05
11/30/2019	NA	NA	0	0	34,097	0	6.08
12/01/2019	NA	NA	0	0	0	0	6.14
12/02/2019	NA	NA	0	0	21,548	0	6.18
12/03/2019	NA	NA	0	0	15,336	0	6.22
12/04/2019	NA	NA	0	0	0	0	6.23
12/05/2019	NA	NA	0	0	0	0	6.23
12/06/2019	NA	NA	0	0	0	0	6.22
12/07/2019	NA	NA	0	0	0	0	6.22
12/08/2019	NA	NA	0	0	0	0	6.22
12/09/2019	349	79	6,823	0	0	6,823	6.21
12/10/2019	381	87	22,687	0	0	22,687	6.30
12/11/2019	549	125	25,656	0	0	25,656	6.30
12/12/2019	881	201	22,396	0	0	22,396	6.30

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Date	Harrison Bayou Flow (gpm)	Maximum Flow Allowed (gpm)	Released From GWTP To Harrison Bayou	Released From INF Pond to Harrison Bayou	Released From GWTP to INF Pond	Combined Total Released to Harrison Bayou	INF Pond Staff Reading (6.20 = 3 ft. Freeboard)
12/13/2019	765	174	12,218	0	0	12,218	6.29
12/14/2019	963	220	0	0	0	0	6.29
12/15/2019	872	199	0	0	0	0	6.29
12/16/2019	821	187	33,848	0	0	33,848	6.28
12/17/2019	759	173	11,925	0	0	11,925	6.28
12/18/2019	695	158	13,018	0	0	13,018	6.27
12/19/2019	554	126	13,575	0	0	13,575	6.27
12/20/2019	661	151	14,437	0	0	14,437	6.27
12/21/2019	590	134	0	0	0	0	6.27
12/22/2019	502	114	0	0	0	0	6.26
12/23/2019	461	105	42,297	0	0	42,297	6.26
12/24/2019	434	98	0	0	0	0	6.26
12/25/2019	391	89	0	0	0	0	6.25
12/26/2019	308	90	39,759	0	0	39,759	6.25
12/27/2019	262	76	12,593	0	0	12,593	6.25
12/28/2019	235	52	0	0	0	0	6.26
12/29/2019	445	120	0	0	0	0	6.29
12/30/2019	541	148	47,016	0	0	47,016	6.29
12/31/2019	502	135	0	0	0	0	6.29
TOTALS			433,751	0	458,556	433,751	

Notes: The maximum discharge rate from the INF Pond is 170 gpm and the maximum discharge rate from the GWTP is 30 gpm.
NA = Not applicable

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Table 5: Monthly Groundwater Extraction Quantities

ICT or Well Number	October 2019 (gallons)	November 2019 (gallons)	December 2019 (gallons)	Total
1	0	0	0	0
2	105,133	2,265	2,750	110,148
3	0	0	0	0
4	5,998	15,342	36,200	57,540
5	0	0	0	0
EW-01	0	12	0	12
7	2,222	205	6,861	9,288
8	21,616	78,383	1,999	101,998
18WW17	0	7,930	13,422	21,352
10	0	0	0	0
11	18,633	34,418	80,451	133,502
12A	4,442	3,725	5,578	13,745
12B	19,977	15,438	17,885	53,300
12C	18,182	46,834	9,862	74,878
12D	4,395	15,849	55,051	75,295
12E	12,746	15,334	15,030	43,110
13A	14,736	12,380	17,737	44,853
13B	0	0	0	0
13C	0	0	0	0
13D	149	1,953	0	2,102
13E	2,153	0	1,144	3,297
13F	1,513	2,324	161	3,998
14A	1,285	3,696	375	5,356
14B	0	800	139	939
14C	56,431	123	71,587	128,141
14D	0	34,551	38,119	72,670
14E	79,045	118,362	91,387	288,794
LHAAP-18/24 Total	368,656	409,924	465,738	1,244,318
Site 16				0
LHAAP-16 Total	0	0	0	0
	368,656	409,924	465,738	1,244,318

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Table 6. LHAAP-18/24 Analytical Results - December 2019

Location ID: Sample Date:	Units	MCL/MSC/ PCL	AWD1_121319 12/13/19	AWD3_121319 12/13/19	AWD3_121319-a 12/13/19	AWD4_121119 12/11/19	18CPTMW01SW_121319 12/13/19	18CPTMW03SW_121119 12/11/19	18CPTMW04_121719 12/17/19	18CPTMW04SW_121719 12/17/19	18CPTMW06_121119 12/11/19	18CPTMW07_121219 12/12/19	18CPTMW08SW_121319 12/13/19	18CPTMW08DW_121319 12/13/19	18CPTMW10SW_120619 12/06/19	18CPTMW10DW_120619 12/06/19	
Lab Package			HS19120844	HS19120843		HS19120696	HS19120844	HS19120702	HS19121036	HS19121036	HS19120702	HS19120765	HS19120843	HS19120843	HS19120386	HS19120386	
Well ID			AWD-1	AWD-3		AWD-4	18CPTMW01SW	18CPTMW03SW	18CPTMW04	18CPTMW04SW	18CPTMW06	18CPTMW07	18CPTMW08SW	18CPTMW08DW	18CPTMW10SW	18CPTMW10DW	
Aquifer Zone:			Shallow	Shallow		Shallow	Wilcox	Wilcox	Shallow	Wilcox	Wilcox	Wilcox	Wilcox	Wilcox	Wilcox	Wilcox	
Perchlorate (6850)																	
Perchlorate	μg/L	17*	1.4 J	32	29	410	< 2.0 U	9.1	520	1.1 J	< 2.0 U	< 2.0 U	24,000	310	< 2.0 U	10	
Volatile Organic Compounds (8260C)																	
1,1,1,2-Tetrachloroethane	μg/L	110	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 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	< 0.5 U	< 0.5 U
1,1,1-Trichloroethane	μg/L	200	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 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	< 0.5 U	< 0.5 U
1,1,2,2-Tetrachloroethane	μg/L	14	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 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	< 0.5 U	< 0.5 U
1,1,2-Trichloroethane	μg/L	5	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 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	< 0.5 U	< 0.5 U
1,1-Dichloroethane	μg/L	10,000	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	3.7	NA	< 0.5 U
1,1-Dichloroethene	μg/L	7	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 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	< 0.5 U	< 0.5 U
1,1-Dichloropropene	μg/L	2.9	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 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	< 0.5 U	< 0.5 U
1,2,3-Trichlorobenzene	μg/L	310	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 UJ	< 0.5 UJ	< 0.5 UJ	< 0.5 UJ	< 0.5 UJ	< 0.5 UJ	< 0.5 UJ	NA	< 0.5 UJ	< 0.5 UJ
1,2,3-Trichloropropane	μg/L	0.041	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 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	< 0.5 U	< 0.5 U
1,2,4-Trichlorobenzene	μg/L	70	NA	< 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	NA	< 0.5 U	< 0.5 U
1,2,4-Trimethylbenzene	μg/L	5,100	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 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	< 0.5 U	< 0.5 U
1,2-Dibromo-3-chloropropane	μg/L	0.2	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 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	< 0.5 U	< 0.5 U
1,2-Dibromoethane	μg/L	0.05	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 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	< 0.5 U	< 0.5 U
1,2-Dichlorobenzene	μg/L	600	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 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	< 0.5 U	< 0.5 U
1,2-Dichloroethane	μg/L	5	NA	1.5	1.5	< 0.5 U	< 0.5 U	1.2	1.1	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U
1,2-Dichloropropane	μg/L	5	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 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	< 0.5 U	< 0.5 U
1,3,5-Trimethylbenzene	μg/L	5,100	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 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	< 0.5 U	< 0.5 U
1,3-Dichlorobenzene	μg/L	3,100	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	0.59 J	NA	< 0.5 U
1,3-Dichloropropane	μg/L	29	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 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	< 0.5 U	< 0.5 U
1,4-Dichlorobenzene	μg/L	75	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 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	< 0.5 U	< 0.5 U
2,2-Dichloropropane	μg/L	42	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 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	< 0.5 U	< 0.5 U
2-Butanone	μg/L	61,000	NA	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	NA	< 1.0 U	< 1.0 U
2-Chlorotoluene	μg/L	2,000	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 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	< 0.5 U	< 0.5 U
2-Hexanone	μg/L	6,100	NA	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	NA	< 1.0 U	< 1.0 U
4-Chlorotoluene	μg/L	2,000	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 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	< 0.5 U	< 0.5 U
4-Isopropyltoluene	μg/L	10,000	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 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	< 0.5 U	< 0.5 U
4-Methyl-2-pentanone	μg/L	8,200	NA	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	NA	< 1.0 U	< 1.0 U
Acetone	μg/L	92,000	NA	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	NA	< 1.0 U	< 1.0 U
Benzene	μg/L	5	NA	< 0.5 U	< 0.5 U	< 0.5 U	3.6	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U
Bromobenzene	μg/L	2,000	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 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	< 0.5 U	< 0.5 U
Bromochloromethane	μg/L	4,100	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 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	< 0.5 U	< 0.5 U
Bromodichloromethane	μg/L	4.6	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 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	< 0.5 U	< 0.5 U
Bromoform	μg/L	36	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 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	< 0.5 U	< 0.5 U
Bromomethane	μg/L	140	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 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	< 0.5 U	< 0.5 U
Carbon disulfide	μg/L	10,000	NA	< 1.0 UJ	< 1.0 UJ	< 1.0 UJ	< 1.0 UJ	< 1.0 UJ	< 1.0 UJ	< 1.0 UJ	< 1.0 UJ	< 1.0 UJ	< 1.0 UJ	< 1.0 UJ	NA	< 1.0 UJ	< 1.0 UJ
Carbon tetrachloride	μg/L	5	NA	8.4	8.5	< 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	NA	< 0.5 U	< 0.5 U
Chlorobenzene	μg/L	100	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 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	< 0.5 U	< 0.5 U
Chloroethane	μg/L	41,000	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 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	< 0.5 U	< 0.5 U
Chloroform	μg/L	1,000	NA	0.97 J	0.99 J	< 0.5 U	< 0.5 U	< 0.5 U	0.84 J	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U
Chloromethane	μg/L	220	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 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	< 0.5 U	< 0.5 U
cis-1,2-Dichloroethene	μg/L	70	NA	6.8	6.9	< 0.5 U	110	2.0	19	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	11	NA	< 0.5 U	< 0.5 U
cis-1,3-Dichloropropene	μg/L	5.3	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 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	< 0.5 U	< 0.5 U
Dibromochloromethane	μg/L	34	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 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	< 0.5 U	< 0.5 U
Dibromomethane	μg/L	380	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 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	< 0.5 U	< 0.5 U
Dichlorodifluoromethane	μg/L	20,000	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 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	< 0.5 U	< 0.5 U
Ethylbenzene	μg/L	700	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 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	< 0.5 U	< 0.5 U
Hexachlorobutadiene	μg/L	20	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 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	< 0.5 U	< 0.5 U
Isopropylbenzene	μg/L	10,000	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 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	< 0.5 U	< 0.5 U
m,p-Xylene	μg/L	10,000**	NA	< 1.0 U	< 1.0 U	< 1.0 U	0.73 J	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	NA	< 1.0 U	< 1.0 U
Methylene chloride																	

GWTP QUARTERLY EVALUATION REPORT - 4TH QUARTER 2019
 LONGHORN ARMY AMMUNITION PLANT

Table 6. LHAAP-18/24 Analytical Results - December 2019

Location ID: Sample Date:	Units	MCL/MSL/ PCL	AWD1_121319 12/13/19	AWD3_121319 12/13/19	AWD3_121319-a 12/13/19	AWD4_121119 12/11/19	18CPTMW01SW_121319 12/13/19	18CPTMW03SW_121119 12/11/19	18CPTMW04_121719 12/17/19	18CPTMW04SW_121719 12/17/19	18CPTMW06_121119 12/11/19	18CPTMW07_121219 12/12/19	18CPTMW08SW_121319 12/13/19	18CPTMW08DW_121319 12/13/19	18CPTMW10SW_120619 12/06/19	18CPTMW10DW_120619 12/06/19
Metals (6020A)																
Aluminum	mg/L	100	4.91	0.164 J	0.105 J	0.692	0.0105 UB	0.0241	NA	0.0524	NA	NA	NA	NA	NA	0.0297 UB
Antimony	mg/L	0.006	0.00119 J	< 0.000500 U	< 0.000500 U	< 0.000500 U	< 0.000500 U	0.000691 J	NA	< 0.000500 U	NA	NA	NA	NA	NA	< 0.000500 U
Arsenic	mg/L	0.01	0.0181	0.000581 J	0.000503 J	< 0.000500 U	0.0145	0.00162 J	NA	0.00167 J	NA	NA	NA	NA	NA	0.00194 J
Barium	mg/L	2	0.359	0.0350	0.0351	0.213	1.20	0.156	NA	0.680	NA	NA	NA	NA	NA	0.124
Beryllium	mg/L	0.004	0.000427 J	< 0.000500 U	< 0.000500 U	0.000204 J	< 0.000500 U	< 0.000500 U	NA	< 0.000500 U	NA	NA	NA	NA	NA	< 0.000500 U
Cadmium	mg/L	0.005	< 0.000500 U	< 0.000500 U	< 0.000500 U	< 0.000500 U	< 0.000500 U	< 0.000500 U	NA	< 0.000500 U	NA	NA	NA	NA	NA	< 0.000500 U
Calcium	mg/L	NV	2.99	0.856	0.855	7.56	35.4	14.0	NA	24.2	NA	NA	NA	NA	NA	10.5
Chromium	mg/L	0.1	0.0162	0.696	0.638	0.0998	0.000961 J	0.0174	NA	0.00722	NA	NA	NA	NA	NA	0.00929
Cobalt	mg/L	6.1	0.00921	0.00622	0.00617	0.00793	0.000350 J	0.00235 J	NA	0.00212 J	NA	NA	NA	NA	NA	0.000146 J
Copper	mg/L	1.3	0.00380 J	0.00578	0.00553	0.00868	< 0.00250 U	< 0.00250 U	NA	< 0.00250 U	NA	NA	NA	NA	NA	< 0.0250 U
Iron	mg/L	NV	8.27	2.32	2.16	2.45	65.1	0.477 UB	NA	4.45	NA	NA	NA	NA	NA	1.23
Lead	mg/L	0.015	0.00334 J	< 0.00100 U	< 0.00100 U	0.000644 J	< 0.00100 U	< 0.00100 U	NA	< 0.00100 U	NA	NA	NA	NA	NA	< 0.00100 U
Magnesium	mg/L	NV	3.68	0.572	0.554	5.12	24.4	9.84	NA	14.7	NA	NA	NA	NA	NA	4.55
Manganese	mg/L	1.1*	0.273	0.0510	0.0497	0.0714	0.666	0.0209	NA	0.196	NA	NA	NA	NA	NA	0.0295
Nickel	mg/L	0.49*	0.0195	0.341	0.340	0.417	0.00104 J	0.00808	NA	0.00408 J	NA	NA	NA	NA	NA	0.00120 J
Potassium	mg/L	NV	3.30	0.639	0.624	0.360	13.0	234	NA	57.0	NA	NA	NA	NA	NA	85.7
Selenium	mg/L	0.05	0.00445 J	0.00549	0.00484 J	< 0.00250 U	< 0.00250 U	< 0.00250 U	NA	< 0.00250 U	NA	NA	NA	NA	NA	< 0.00250 U
Silver	mg/L	0.51	< 0.000500 U	< 0.000500 U	< 0.000500 U	< 0.000500 U	< 0.000500 U	< 0.000500 U	NA	< 0.000500 U	NA	NA	NA	NA	NA	< 0.000500 U
Sodium	mg/L	NV	105	32.1	31.3	46.7	122	278	NA	105	NA	NA	NA	NA	NA	179
Thallium	mg/L	0.002	< 0.000500 U	< 0.000500 U	< 0.000500 U	< 0.000500 U	< 0.000500 U	< 0.000500 U	NA	< 0.000500 U	NA	NA	NA	NA	NA	< 0.000500 U
Vanadium	mg/L	0.72	0.00878	0.00278 J	0.00272 J	0.00331 J	< 0.00100 U	< 0.00100 U	NA	< 0.00100 U	NA	NA	NA	NA	NA	< 0.00100 U
Zinc	mg/L	31	0.0165	0.00274 J	0.00330 J	0.00835	0.00328 J	0.00605	NA	0.0153	NA	NA	NA	NA	NA	0.00373 J
Mercury	mg/L	0.002	< 0.000100 U	< 0.000100 U	< 0.000100 U	0.0000530 J	< 0.000100 U	< 0.000100 U	NA	< 0.000100 U	NA	NA	NA	NA	NA	< 0.000100 U
1,4-Dioxane (8270D SIM)																
1,4-Dioxane	µg/L	9.1	< 0.010 U	NA	NA	< 0.010 U	0.19	2.3	2.8	1.6	0.055	1.3	3	0.31	< 0.010 U	NA

Notes:

Blue highlighting indicates concentrations above the MCL/MSL/PCL

MCL/MSL - Maximum Contaminant Limit/Medium-Specific Concentrations/Protective Concentration Level

NA - Not Analyzed

µg/L - micrograms per liter

mg/L - milligrams per liter

J - Estimated: The analyte was positively identified, the quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.

UJ - The analyte was not detected; however, the result is estimated due to discrepancies in meeting certain analyte-specific quality control criteria.

U - Undetected: The analyte was analyzed for, but not detected.

UB - considered a non-detect due to blank contamination

NV - No Value

*Perchlorate, manganese, and nickel compared to the PCL

** Value is for total xylenes

PCL - Texas Risk Reduction Program (TRRP) Tier 1 Groundwater Residential Protective Concentration Level

a - duplicate sample

GWTP QUARTERLY EVALUATION REPORT –4TH QUARTER 2019
LONGHORN ARMY AMMUNITION PLANT

Table 6. LHAAP-18/24 Analytical Results - December 2019

Location ID: Sample Date:	Units	MCL/MSC/ PCL	18CPTMW12SW_120619 12/06/19	18CPTMW12DW_120619 12/06/19	18CPTMW14_120919 12/09/19	18CPTMW15_121119 12/11/19	18CPTMW16_121319 12/13/19	18CPTMW18_121119 12/11/19	18CPTMW19_121119 12/11/19	18CPTMW22R_120519 12/05/19	18CPTMW22SW_120519 12/05/19	18CPTMW23_120919 12/09/19	18CPTMW24_121219 12/12/19	18WW02_120919 12/09/19	18WW06_120919 12/09/19	18WW08_121119 12/11/19
Metals (6020A)																
Aluminum	mg/L	100	0.0145 UB	0.0121 UB	0.125	NA	NA	0.0128 UB	NA	22.4	0.0584	NA	0.00631 UB	0.268	NA	NA
Antimony	mg/L	0.006	< 0.000500 U	< 0.000500 U	< 0.000500 U	NA	NA	< 0.000500 U	NA	< 0.000500 U	< 0.000500 U	NA	< 0.000500 U	< 0.000500 U	NA	NA
Arsenic	mg/L	0.01	0.000792 J	0.00304 J	0.00169 J	NA	NA	0.00125 J	NA	0.000937 J	0.00197 J	NA	0.00791	0.000627 J	NA	NA
Barium	mg/L	2	0.815	0.0892	5.74	NA	NA	0.686	NA	0.0563	0.0995	NA	11.7	0.0407	NA	NA
Beryllium	mg/L	0.004	< 0.000500 U	< 0.000500 U	< 0.000500 U	NA	NA	< 0.000500 U	NA	0.000311 J	< 0.000500 U	NA	< 0.000500 U	< 0.000500 U	NA	NA
Cadmium	mg/L	0.005	< 0.000500 U	< 0.000500 U	0.000245 J	NA	NA	0.000346 J	NA	< 0.000500 U	< 0.000500 U	NA	< 0.000500 U	< 0.000500 U	NA	NA
Calcium	mg/L	NV	63.3	6.13	486	NA	NA	241	NA	0.579	13.4	NA	427	6.86	NA	NA
Chromium	mg/L	0.1	0.00725	0.00294 J	0.00510	NA	NA	0.00161 J	NA	0.00195 J	0.0100	NA	0.000465 J	0.0104	NA	NA
Cobalt	mg/L	6.1	0.00232 J	< 0.000500 U	0.00966	NA	NA	0.0159	NA	0.00610	< 0.000500 U	NA	0.00358 J	0.000280 J	NA	NA
Copper	mg/L	1.3	< 0.00250 U	< 0.00250 U	< 0.00250 U	NA	NA	< 0.00250 U	NA	0.00200 J	< 0.00250 U	NA	< 0.00250 U	0.00499 J	NA	NA
Iron	mg/L	NV	0.776	0.873	0.926	NA	NA	0.802 UB	NA	2.03	0.0392 J	NA	8.69	1.87	NA	NA
Lead	mg/L	0.015	< 0.00100 U	< 0.00500	< 0.00100 U	NA	NA	< 0.00100 U	NA	0.00129 J	< 0.00100 U	NA	< 0.00100 U	0.000841 J	NA	NA
Magnesium	mg/L	NV	35.2	3.74	130	NA	NA	183	NA	0.689	4.52	NA	286	1.22	NA	NA
Manganese	mg/L	1.1*	0.379	0.0237	0.514	NA	NA	2.03	NA	0.0484	0.0157	NA	0.668	0.0860	NA	NA
Nickel	mg/L	0.49*	0.00624	< 0.00100 U	0.00637	NA	NA	0.0148	NA	0.00260 J	0.000611 J	NA	0.00536	0.00775	NA	NA
Potassium	mg/L	NV	41.3	70.8	15.6	NA	NA	2.99	NA	0.265	281	NA	3.19	1.78	NA	NA
Selenium	mg/L	0.05	< 0.00250 U	< 0.00250 U	< 0.00250 U	NA	NA	< 0.00250 U	NA	< 0.00250 U	< 0.00250 U	NA	< 0.00250 U	< 0.00250 U	NA	NA
Silver	mg/L	0.51	< 0.000500 U	< 0.000500 U	< 0.000500 U	NA	NA	< 0.000500 U	NA	< 0.000500 U	< 0.000500 U	NA	< 0.000500 U	< 0.000500 U	NA	NA
Sodium	mg/L	NV	232	163	567	NA	NA	667	NA	18.3	280	NA	1,120	23.7	NA	NA
Thallium	mg/L	0.002	< 0.000500 U	< 0.000500 U	< 0.000500 U	NA	NA	< 0.000500 U	NA	0.000661 J	< 0.000500 U	NA	< 0.000500 U	< 0.000500 U	NA	NA
Vanadium	mg/L	0.72	< 0.00100 U	< 0.00100 U	0.000939 J	NA	NA	0.00113 J	NA	0.00386 J	0.000853 J	NA	0.00122 J	0.00222 J	NA	NA
Zinc	mg/L	31	0.0122	< 0.00250 U	0.00617	NA	NA	0.0270	NA	0.00834	0.0139	NA	0.00658	0.00466 J	NA	NA
Mercury	mg/L	0.002	< 0.000100 U	< 0.000100 U	< 0.000100 U	NA	NA	< 0.000100 U	NA	< 0.000100 U	< 0.000100 U	NA	< 0.000100 U	< 0.000100 U	NA	NA
1,4-Dioxane (8270D SIM)																
1,4-Dioxane	µg/L	9.1	0.14	0.36	0.22	< 0.010 U	0.18	NA	< 0.010 U	< 0.010 U	2.5	15	1.3	< 0.010 U	< 0.010 U	0.12

Notes:
 Blue highlighting indicates concentrations above the MCL/MSC/PCL
 MCL/MSC - Maximum Contaminant Limit/Medium-Specific Concentrations/Protective Concentration Level
 NA - Not Analyzed
 µg/L - micrograms per liter
 mg/L - milligrams per liter
 J - Estimated: The analyte was positively identified, the quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.
 UJ - The analyte was not detected; however, the result is estimated due to discrepancies in meeting certain analyte-specific quality control criteria.
 U - Undetected: The analyte was analyzed for, but not detected.
 UB - considered a non-detect due to blank contamination
 NV - No Value
 *Perchlorate, manganese, and nickel compared to the PCL
 ** Value is for total xylenes
 PCL – Texas Risk Reduction Program (TRRP) Tier 1 Groundwater Residenti
 a - duplicate sample

Table 6. LHAAP-18/24 Analytical Results - December 2019

Location ID: Sample Date:	Units	MCL/MSC/ PCL	18WW10_120919 12/09/19	18WW17_120619 12/06/19	18WW22_121219 12/12/19	18WW22_121219_a 12/12/19	18WW24_121119 12/11/19	CO3_121119 12/11/19	CO8_121219 12/12/19	CO9_121719 12/17/19	MW2_121319 12/13/19	MW2_121319-a 12/13/19	MW3_121219 12/12/19	MW5_121319 12/13/19	MW7_120619 12/06/19	MW8_120519 12/05/19
Lab Package			HS19120544	HS19120386	HS19120765		HS19120696	HS19120696	HS19120765	HS19121036	HS19120844		HS19120765	HS19120843	HS19120386	HS19120354
Well ID			18WW10	18WW17	18WW22		18WW24	C-03	C-08	C-09	MW-2		MW-3	MW-5	MW-7	MW-8
Aquifer Zone:			Shallow	Shallow	Shallow		Shallow	Wilcox	Shallow	Shallow	Shallow		Shallow	Shallow	Shallow	Shallow
Perchlorate (6850)																
Perchlorate	µg/L	17*	< 2.0 U	74,000	< 2.0 U	< 2.0 U	< 2.0 U	15	< 2.0 U	1.5 J	< 2.0 U	< 2.0 U	15,000	32,000	25,000	4,100
Volatile Organic Compounds (8260C)																
1,1,1,2-Tetrachloroethane	µg/L	110	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 25 U	< 25 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,1,1-Trichloroethane	µg/L	200	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 25 U	< 25 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,1,2,2-Tetrachloroethane	µg/L	14	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 25 U	< 25 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,1,2-Trichloroethane	µg/L	5	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 25 U	< 25 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,1-Dichloroethane	µg/L	10,000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	21 J	< 25 U	4.3	3.0	0.49 J	< 0.5 U
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 UJ	83	70	< 0.5 U	< 0.5 U	14	< 0.5 U
1,1-Dichloropropene	µg/L	2.9	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 25 U	< 25 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,2,3-Trichlorobenzene	µg/L	310	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 25 UJ	< 25 UJ	< 0.5 U	< 0.5 UJ	< 0.5 UJ	< 0.5 U
1,2,3-Trichloropropane	µg/L	0.041	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 25 U	< 25 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,2,4-Trichlorobenzene	µg/L	70	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 25 U	< 25 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,2,4-Trimethylbenzene	µg/L	5,100	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 25 U	< 25 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,2-Dibromo-3-chloropropane	µg/L	0.2	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 25 U	< 25 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,2-Dibromoethane	µg/L	0.05	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 25 U	< 25 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,2-Dichlorobenzene	µg/L	600	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 25 U	< 25 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,2-Dichloroethane	µg/L	5	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 25 U	< 25 U	< 0.5 U	< 0.5 U	30	1.7
1,2-Dichloropropane	µg/L	5	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 25 U	< 25 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,3,5-Trimethylbenzene	µg/L	5,100	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 25 U	< 25 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,3-Dichlorobenzene	µg/L	3,100	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 25 U	< 25 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,3-Dichloropropane	µg/L	29	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 25 U	< 25 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,4-Dichlorobenzene	µg/L	75	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 25 U	< 25 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
2,2-Dichloropropane	µg/L	42	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 25 U	< 25 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
2-Butanone	µg/L	61,000	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 50 U	< 50 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
2-Chlorotoluene	µg/L	2,000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 25 U	< 25 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
2-Hexanone	µg/L	6,100	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 50 U	< 50 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
4-Chlorotoluene	µg/L	2,000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 25 U	< 25 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
4-Isopropyltoluene	µg/L	10,000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 25 U	< 25 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
4-Methyl-2-pentanone	µg/L	8,200	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 50 U	< 50 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Acetone	µg/L	92,000	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 50 U	< 50 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Benzene	µg/L	5	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 25 U	< 25 U	< 0.5 U	< 0.5 U	6.3	< 0.5 U
Bromobenzene	µg/L	2,000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 25 U	< 25 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Bromochloromethane	µg/L	4,100	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	72	60	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Bromodichloromethane	µg/L	4.6	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 25 U	< 25 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Bromoform	µg/L	36	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 25 U	< 25 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Bromomethane	µg/L	140	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 25 U	< 25 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U
Carbon disulfide	µg/L	10,000	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 UJ	< 1.0 UJ	< 1.0 U	< 1.0 U	< 50 UJ	< 50 UJ	< 1.0 U	< 1.0 UJ	< 1.0 U	< 1.0 U
Carbon tetrachloride	µg/L	5	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 25 U	< 25 U	< 0.5 U	< 0.5 U	6.0	< 0.5 U
Chlorobenzene	µg/L	100	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 25 U	< 25 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Chloroethane	µg/L	41,000	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 25 U	< 25 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U
Chloroform	µg/L	1,000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	30 J	31 J	1.3	< 0.5 U	19	< 0.5 U
Chloromethane	µg/L	220	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 25 U	< 25 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U
cis-1,2-Dichloroethene	µg/L	70	< 0.5 U	0.74 J	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	21,000	20,000	65	10	28	15
cis-1,3-Dichloropropene	µg/L	5.3	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 25 U	< 25 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Dibromochloromethane	µg/L	34	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 25 U	< 25 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Dibromomethane	µg/L	380	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 25 U	< 25 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Dichlorodifluoromethane	µg/L	20,000	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 25 U	< 25 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U
Ethylbenzene	µg/L	700	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 25 U	< 25 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Hexachlorobutadiene	µg/L	20	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 50 U	< 50 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Isopropylbenzene	µg/L	10,000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 25 U	< 25 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 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	< 50 U	< 50 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Methylene chloride	µg/L	5	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	42,000	41,000	< 1.0 U	<		

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 LONGHORN ARMY AMMUNITION PLANT

Table 6. LHAAP-18/24 Analytical Results - December 2019

Location ID: Sample Date:	Units	MCL/MSL/ PCL	18WW10_120919 12/09/19	18WW17_120619 12/06/19	18WW22_121219 12/12/19	18WW22_121219_a 12/12/19	18WW24_121119 12/11/19	CO3_121119 12/11/19	CO8_121219 12/12/19	CO9_121719 12/17/19	MW2_121319 12/13/19	MW2_121319-a 12/13/19	MW3_121219 12/12/19	MW5_121319 12/13/19	MW7_120619 12/06/19	MW8_120519 12/05/19
Metals (6020A)																
Aluminum	mg/L	100	NA	0.00775 UB	0.537	0.548	0.0872	NA	0.0286	0.149	0.0283	0.0314	0.00215 UB	0.00447 UB	NA	NA
Antimony	mg/L	0.006	NA	< 0.000500 U	0.000417 J	< 0.000500 U	< 0.000500 U	NA	< 0.000500 U	< 0.000500 U	0.000434 J	< 0.000500 U	< 0.000500 U	< 0.000500 U	NA	NA
Arsenic	mg/L	0.01	NA	0.000411 J	0.00476 J	0.00499 J	0.00123 J	NA	< 0.000500 U	< 0.000500 U	0.0440	0.0431	< 0.000500 U	< 0.000500 U	NA	NA
Barium	mg/L	2	NA	3.28	0.0862	0.0898	0.0733	NA	4.53	0.948	2.62	2.57	0.614	0.977	NA	NA
Beryllium	mg/L	0.004	NA	< 0.000500 U	< 0.000500 U	< 0.000500 U	0.000558 J	NA	< 0.000500 U	< 0.000500 U	0.000362 J	0.000394 J	< 0.000500 U	< 0.000500 U	NA	NA
Cadmium	mg/L	0.005	NA	0.000392 J	< 0.000500 U	< 0.000500 U	0.000487 J	NA	0.000401 J	0.000207 J	0.000329 J	0.000495 J	0.000342 J	0.000789 J	NA	NA
Calcium	mg/L	NV	NA	326	22.8	23.7	29.4	NA	261	236	80.5	77.1	33.1	23.1	NA	NA
Chromium	mg/L	0.1	NA	0.0411	0.0309	0.0318	0.000461 J	NA	< 0.000500 U	0.00256 J	0.0216	0.0200	0.000982 J	0.0330	NA	NA
Cobalt	mg/L	6.1	NA	0.00213 J	0.000444 J	0.000409 J	0.00579	NA	0.00355 J	0.00104 J	0.109	0.107	0.00483 J	0.00353 J	NA	NA
Copper	mg/L	1.3	NA	0.00515	0.00117 J	0.00104 J	0.00152 J	NA	< 0.00250 U	< 0.00250 U	0.00306 J	0.00301 J	< 0.00250 U	< 0.00250 U	NA	NA
Iron	mg/L	NV	NA	0.548	0.241 UB	0.0233 UB	0.0979 UB	NA	0.558 UB	0.159 J	36.4	35.6	0.343 UB	0.127 UB	NA	NA
Lead	mg/L	0.015	NA	< 0.00100 U	< 0.00100 U	< 0.00100 U	< 0.00100 U	NA	< 0.00100 U	< 0.00100 U	< 0.00100 U	< 0.00100 U	< 0.00100 U	< 0.00100 U	NA	NA
Magnesium	mg/L	NV	NA	215	0.198 J	0.201	24.0	NA	168	79.1	59.0	58.2	20.6	24.8	NA	NA
Manganese	mg/L	1.1*	NA	0.0461	0.00292 UB	0.00125 UB	2.09	NA	0.452	0.169	6.09	6.27	2.47	0.0984	NA	NA
Nickel	mg/L	0.49*	NA	0.134	< 0.00100 U	< 0.00100 U	0.108	NA	0.00153 J	0.0250	0.0628	0.0612	0.00606	0.0630	NA	NA
Potassium	mg/L	NV	NA	1.55	6.11	6.33	0.604	NA	1.96	0.977	2.96	2.98	1.76	2.30	NA	NA
Selenium	mg/L	0.05	NA	0.00236 J	0.00124 J	0.00184 J	< 0.00250 U	NA	< 0.00250 U	< 0.00250 U	< 0.00250 U	< 0.00250 U	< 0.00250 U	< 0.00250 U	NA	NA
Silver	mg/L	0.51	NA	< 0.000500 U	< 0.000500 U	< 0.000500 U	< 0.000500 U	NA	< 0.000500 U	< 0.000500 U	< 0.000500 U	< 0.000500 U	< 0.000500 U	< 0.000500 U	NA	NA
Sodium	mg/L	NV	NA	1060	59.9	62.5	567	NA	717	256	220	217	292	129	NA	NA
Thallium	mg/L	0.002	NA	< 0.000500 U	< 0.000500 U	< 0.000500 U	0.000536 J	NA	< 0.000500 U	< 0.000500 U	< 0.000500 U	< 0.000500 U	< 0.000500 U	< 0.000500 U	NA	NA
Vanadium	mg/L	0.72	NA	0.00186 J	0.0458	0.0483	0.00129 J	NA	0.000998 J	< 0.00100 U	0.00191 J	0.00150 J	0.000932 J	0.00147 J	NA	NA
Zinc	mg/L	31	NA	0.0183	< 0.00250 U	< 0.00250 U	0.0483	NA	0.00604	0.00734 UB	0.148	0.142	0.00550	0.0222	NA	NA
Mercury	mg/L	0.002	NA	< 0.000100 U	< 0.000100 U	< 0.000200	< 0.000100 U	NA	< 0.000100 U	< 0.000100 U	< 0.000100 U	< 0.000100 U	< 0.000100 U	< 0.000100 U	NA	NA
1,4-Dioxane (8270D SIM)																
1,4-Dioxane	µg/L	9.1	< 0.010 U	NA	0.92	0.9	NA	0.054	1.2	NA	5.7	7.1	NA	1.6	42	2.9

Notes:

Blue highlighting indicates concentrations above the MCL/MSL/PCL

MCL/MSL - Maximum Contaminant Limit/Medium-Specific Concentrations/Protective Concentration Level

NA - Not Analyzed

µg/L - micrograms per liter

mg/L - milligrams per liter

J - Estimated: The analyte was positively identified, the quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.

UJ - The analyte was not detected; however, the result is estimated due to discrepancies in meeting certain analyte-specific quality control criteria.

U - Undetected: The analyte was analyzed for, but not detected.

UB - considered a non-detect due to blank contamination

NV - No Value

*Perchlorate, manganese, and nickel compared to the PCL

** Value is for total xylenes

PCL - Texas Risk Reduction Program (TRRP) Tier 1 Groundwater Residenti

a - duplicate sample

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LONGHORN ARMY AMMUNITION PLANT

Table 6. LHAAP-18/24 Analytical Results - December 2019

Location ID: Sample Date:	Units	MCL/MSC/ PCL	MW9_120519 12/05/19	MW10_120519 12/05/19	MW14_121719 12/17/19	MW16_120919 12/09/19	MW17_120519 12/05/19	MW18_121719 12/17/19	MW19_120919 12/09/19	MW20_120519 12/05/19	MW20_120519-a 12/05/19	MW21_121119 12/11/19	MW21_121119-a 12/11/19	MW22_121119 12/11/19	MW23_121219 12/12/19	MW23_121219-a 12/12/19	109_121219 12/12/19	120_121719 12/17/19	125_121219 12/12/19	126_121719 12/17/19	126_121719-a 12/17/19	
Lab Package			HS19120354	HS19120354	HS19121036	HS19120544	HS19120354	HS19121036	HS19120544	HS19120354		HS19120702		HS19120702	HS19120765		HS19120765	HS19121036	HS19120765	HS19121036		
Well ID			MW-9	MW-10	MW-14	MW-16	MW-17	MW-18	MW-19	MW-20		MW-21		MW-22	MW-23		109	120	125	126		
Aquifer Zone:			Shallow	Shallow	Wilcox	Shallow	Shallow	Shallow	Shallow	Shallow		Shallow		Shallow	Shallow		Shallow	Shallow	Shallow	Shallow		
Perchlorate (6850)																						
Perchlorate	µg/L	17*	320	< 2.0 U	130,000	1.8 J	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	13,000	13,000	210	73,000	80,000	1,000	23,000	1,800	< 2.0 U	< 2.0 U	
Volatiles Organic Compounds (8260C)																						
1,1,1,2-Tetrachloroethane	µg/L	110	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 5.0 U	< 0.5 U	< 5.0 U	< 5.0 U	< 0.5 U	< 12 U	< 0.5 U	< 0.5 U	< 0.5 U	
1,1,1-Trichloroethane	µg/L	200	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 5.0 U	< 0.5 U	< 5.0 U	< 5.0 U	< 0.5 U	< 12 U	< 0.5 U	< 0.5 U	< 0.5 U	
1,1,2,2-Tetrachloroethane	µg/L	14	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 5.0 U	< 0.5 U	< 5.0 U	< 5.0 U	< 0.5 U	< 12 U	< 0.5 U	< 0.5 U	< 0.5 U	
1,1,2-Trichloroethane	µg/L	5	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	6.6 J	6.1 J	< 0.5 U	< 5.0 U	< 5.0 U	< 0.5 U	< 12 U	< 0.5 U	< 0.5 U	< 0.5 U	
1,1-Dichloroethane	µg/L	10,000	0.52 J	< 0.5 U	26	1.4	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 5.0 U	< 0.5 U	< 5.0 U	< 5.0 U	0.89 J	16 J	< 0.5 U	< 0.5 U	< 0.5 U	
1,1-Dichloroethene	µg/L	7	1.5	< 0.5 U	87	6.1	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 5.0 U	< 0.5 U	< 5.0 U	< 5.0 U	< 0.5 U	79	< 0.5 U	< 0.5 U	< 0.5 U	
1,1-Dichloropropene	µg/L	2.9	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 5.0 U	< 0.5 U	< 5.0 U	< 5.0 U	< 0.5 U	< 12 U	< 0.5 U	< 0.5 U	< 0.5 U	
1,2,3-Trichlorobenzene	µg/L	310	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 5.0 U	< 0.5 U	< 5.0 U	< 5.0 U	< 0.5 U	< 12 U	< 0.5 U	< 0.5 U	< 0.5 U	
1,2,3-Trichloropropane	µg/L	0.041	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 5.0 U	< 0.5 U	< 5.0 U	< 5.0 U	< 0.5 U	< 12 U	< 0.5 U	< 0.5 U	< 0.5 U	
1,2,4-Trichlorobenzene	µg/L	70	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 5.0 U	< 0.5 U	< 5.0 U	< 5.0 U	< 0.5 U	< 12 U	< 0.5 U	< 0.5 U	< 0.5 U	
1,2,4-Trimethylbenzene	µg/L	5,100	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 5.0 U	< 0.5 U	< 5.0 U	< 5.0 U	< 0.5 U	< 12 U	< 0.5 U	< 0.5 U	< 0.5 U	
1,2-Dibromo-3-chloropropane	µg/L	0.2	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 5.0 U	< 0.5 U	< 5.0 U	< 5.0 U	< 0.5 U	< 12 U	< 0.5 U	< 0.5 U	< 0.5 U	
1,2-Dibromoethane	µg/L	0.05	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 5.0 U	< 0.5 U	< 5.0 U	< 5.0 U	< 0.5 U	< 12 U	< 0.5 U	< 0.5 U	< 0.5 U	
1,2-Dichlorobenzene	µg/L	600	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 5.0 U	< 0.5 U	< 5.0 U	< 5.0 U	< 0.5 U	< 12 U	< 0.5 U	< 0.5 U	< 0.5 U	
1,2-Dichloroethane	µg/L	5	< 0.5 U	< 0.5 U	73	43	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	19	19	4.3	69	68	< 0.5 U	25	< 0.5 U	< 0.5 U	< 0.5 U	
1,2-Dichloropropane	µg/L	5	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 5.0 U	< 0.5 U	< 5.0 U	< 5.0 U	< 0.5 U	< 12 U	< 0.5 U	< 0.5 U	< 0.5 U	
1,3,5-Trimethylbenzene	µg/L	5,100	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 5.0 U	< 0.5 U	< 5.0 U	< 5.0 U	< 0.5 U	< 12 U	< 0.5 U	< 0.5 U	< 0.5 U	
1,3-Dichlorobenzene	µg/L	3,100	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 5.0 U	< 0.5 U	< 5.0 U	< 5.0 U	< 0.5 U	< 12 U	< 0.5 U	< 0.5 U	< 0.5 U	
1,3-Dichloropropane	µg/L	29	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 5.0 U	< 0.5 U	< 5.0 U	< 5.0 U	< 0.5 U	< 12 U	< 0.5 U	< 0.5 U	< 0.5 U	
1,4-Dichlorobenzene	µg/L	75	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 5.0 U	< 0.5 U	< 5.0 U	< 5.0 U	< 0.5 U	< 12 U	< 0.5 U	< 0.5 U	< 0.5 U	
2,2-Dichloropropane	µg/L	42	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 5.0 U	< 0.5 U	< 5.0 U	< 5.0 U	< 0.5 U	< 12 U	< 0.5 U	< 0.5 U	< 0.5 U	
2-Butanone	µg/L	61,000	< 1.0 U	< 1.0 U	< 25 U	< 1.0 U	NA	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 10 U	< 10 U	< 1.0 U	< 10 U	< 10 U	< 1.0 U	< 25 U	< 1.0 U	< 1.0 U	< 1.0 U	
2-Chlorotoluene	µg/L	2,000	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 5.0 U	< 0.5 U	< 5.0 U	< 5.0 U	< 0.5 U	< 12 U	< 0.5 U	< 0.5 U	< 0.5 U	
2-Hexanone	µg/L	6,100	< 1.0 U	< 1.0 U	< 25 U	< 1.0 U	NA	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 10 U	< 10 U	< 1.0 U	< 10 U	< 10 U	< 1.0 U	< 25 U	< 1.0 U	< 1.0 U	< 1.0 U	
4-Chlorotoluene	µg/L	2,000	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 5.0 U	< 0.5 U	< 5.0 U	< 5.0 U	< 0.5 U	< 12 U	< 0.5 U	< 0.5 U	< 0.5 U	
4-Isopropyltoluene	µg/L	10,000	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 5.0 U	< 0.5 U	< 5.0 U	< 5.0 U	< 0.5 U	< 12 U	< 0.5 U	< 0.5 U	< 0.5 U	
4-Methyl-2-pentanone	µg/L	8,200	< 1.0 U	< 1.0 U	< 25 U	< 1.0 U	NA	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 10 U	< 10 U	< 1.0 U	< 10 U	< 10 U	< 1.0 U	< 25 U	< 1.0 U	< 1.0 U	< 1.0 U	
Acetone	µg/L	92,000	< 1.0 U	< 1.0 U	< 25 U	< 1.0 U	NA	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 10 U	< 10 U	< 1.0 U	< 10 U	< 10 U	< 1.0 U	< 25 U	< 1.0 U	< 1.0 U	< 1.0 U	
Benzene	µg/L	5	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 5.0 U	0.89 J	< 5.0 U	< 5.0 U	< 0.5 U	< 12 U	< 0.5 U	< 0.5 U	< 0.5 U	
Bromobenzene	µg/L	2,000	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 5.0 U	< 0.5 U	< 5.0 U	< 5.0 U	< 0.5 U	< 12 U	< 0.5 U	< 0.5 U	< 0.5 U	
Bromochloromethane	µg/L	4,100	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 5.0 U	< 0.5 U	< 5.0 U	< 5.0 U	< 0.5 U	< 12 U	< 0.5 U	< 0.5 U	< 0.5 U	
Bromodichloromethane	µg/L	4.6	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 5.0 U	< 0.5 U	< 5.0 U	< 5.0 U	< 0.5 U	< 12 U	< 0.5 U	< 0.5 U	< 0.5 U	
Bromoform	µg/L	36	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 5.0 U	< 0.5 U	< 5.0 U	< 5.0 U	< 0.5 U	< 12 U	< 0.5 U	< 0.5 U	< 0.5 U	
Bromomethane	µg/L	140	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 5.0 U	< 0.5 U	< 5.0 U	< 5.0 U	< 0.5 U	< 12 U	< 0.5 U	< 0.5 U	< 0.5 U	
Carbon disulfide	µg/L	10,000	< 1.0 U	< 1.0 U	< 25 U	< 1.0 U	NA	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 10 U	< 10 U	< 1.0 U	< 10 U	< 10 U	< 1.0 U	< 25 U	< 1.0 U	< 1.0 U	< 1.0 U	
Carbon tetrachloride	µg/L	5	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 5.0 U	< 0.5 U	< 5.0 U	< 5.0 U	< 0.5 U	< 12 U	< 0.5 U	< 0.5 U	< 0.5 U	
Chlorobenzene	µg/L	100	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 5.0 U	< 0.5 U	< 5.0 U	< 5.0 U	< 0.5 U	< 12 U	< 0.5 U	< 0.5 U	< 0.5 U	
Chloroethane	µg/L	41,000	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 5.0 U	< 0.5 U	< 5.0 U	< 5.0 U	< 0.5 U	< 12 U	< 0.5 U	< 0.5 U	< 0.5 U	
Chloro																						

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Table 6. LHAAP-18/24 Analytical Results - December 2019

Location ID: Sample Date:	Units	MCL/MSL/ PCL	MW9_120519 12/05/19	MW10_120519 12/05/19	MW14_121719 12/17/19	MW16_120919 12/09/19	MW17_120519 12/05/19	MW18_121719 12/17/19	MW19_120919 12/09/19	MW20_120519 12/05/19	MW20_120519-a 12/05/19	MW21_121119 12/11/19	MW21_121119-a 12/11/19	MW22_121119 12/11/19	MW23_121219 12/12/19	MW23_121219-a 12/12/19	109_121219 12/12/19	120_121719 12/17/19	125_121219 12/12/19	126_121719 12/17/19	126_121719-a 12/17/19
Metals (6020A)																					
Aluminum	mg/L	100	0.0208 UB	NA	0.0444	NA	NA	NA	0.461	NA	NA	0.00790 UB	0.00780 UB	0.0245	NA	NA	NA	NA	0.430	0.0570	0.0507
Antimony	mg/L	0.006	< 0.000500 U	NA	< 0.000500 U	NA	NA	NA	< 0.000500 U	NA	NA	< 0.000500 U	< 0.000500 U	0.000693 J	NA	NA	NA	NA	< 0.000500 U	< 0.000500 U	< 0.000500 U
Arsenic	mg/L	0.01	< 0.000500 U	NA	0.00751	NA	NA	NA	0.00705	NA	NA	0.000444 J	< 0.000500 U	0.00130 J	NA	NA	NA	NA	0.000643 J	0.00342 J	0.00323 J
Barium	mg/L	2	0.0605	NA	0.202	NA	NA	NA	0.547	NA	NA	4.46	4.45	0.897	NA	NA	NA	NA	0.107	8.65	8.50
Beryllium	mg/L	0.004	< 0.000500 U	NA	0.000360 J	NA	NA	NA	< 0.000500 U	NA	NA	< 0.000500 U	< 0.000500 U	< 0.000500 U	NA	NA	NA	NA	< 0.000500 U	< 0.000500 U	< 0.000500 U
Cadmium	mg/L	0.005	< 0.000500 U	NA	0.000887 J	NA	NA	NA	0.000382 J	NA	NA	0.000516 J	0.000542 J	0.000500 J	NA	NA	NA	NA	< 0.000500 U	0.000301 J	0.000264 J
Calcium	mg/L	NV	5.82	NA	87.4	NA	NA	NA	110	NA	NA	170	168	74.0	NA	NA	NA	NA	2.06	313	316
Chromium	mg/L	0.1	0.138	NA	0.0844	NA	NA	NA	0.0839	NA	NA	0.201	0.223	0.520	NA	NA	NA	NA	0.00167 J	< 0.00500 U	< 0.00500 U
Cobalt	mg/L	6.1	0.00128 J	NA	0.0415	NA	NA	NA	0.0106	NA	NA	0.0495	0.0497	0.0101	NA	NA	NA	NA	0.000632 J	0.0103	0.00992
Copper	mg/L	1.3	< 0.00250 U	NA	0.00180 J	NA	NA	NA	0.00372 J	NA	NA	0.0360	0.0361	0.0109	NA	NA	NA	NA	< 0.00250 U	< 0.00250 U	< 0.00250 U
Iron	mg/L	NV	0.864	NA	101	NA	NA	NA	88.9	NA	NA	2.92	2.86	6.06	NA	NA	NA	NA	0.617 UB	2.77	2.80
Lead	mg/L	0.015	< 0.00100 U	NA	< 0.00100 U	NA	NA	NA	< 0.00100 U	NA	NA	< 0.00100 U	< 0.00100 U	< 0.00100 U	NA	NA	NA	NA	< 0.00100 U	< 0.00100 U	< 0.00100 U
Magnesium	mg/L	NV	1.95	NA	51.6	NA	NA	NA	60.4	NA	NA	130	128	33.7	NA	NA	NA	NA	1.56	235	243
Manganese	mg/L	1.1*	0.0324	NA	3.76	NA	NA	NA	2.23	NA	NA	1.60	1.60	0.257	NA	NA	NA	NA	0.0135	0.165	0.160
Nickel	mg/L	0.49*	0.00604	NA	0.112	NA	NA	NA	0.0736	NA	NA	0.549	0.541	0.283	NA	NA	NA	NA	0.00252 J	0.0121	0.0119
Potassium	mg/L	NV	0.396	NA	10.1	NA	NA	NA	4.48	NA	NA	2.09	2.05	2.07	NA	NA	NA	NA	0.676	3.28	3.23
Selenium	mg/L	0.05	< 0.00250 U	NA	< 0.00250 U	NA	NA	NA	< 0.0250 U	NA	NA	< 0.00250 U	< 0.00250 U	< 0.00250 U	NA	NA	NA	NA	< 0.00250 U	< 0.00250 U	< 0.00250 U
Silver	mg/L	0.51	< 0.000500 U	NA	< 0.000500 U	NA	NA	NA	< 0.000500 U	NA	NA	< 0.000500 U	< 0.000500 U	< 0.000500 U	NA	NA	NA	NA	< 0.000500 U	< 0.000500 U	< 0.000500 U
Sodium	mg/L	NV	13.2	NA	363	NA	NA	NA	852	NA	NA	465	455	375	NA	NA	NA	NA	43.8	838	850
Thallium	mg/L	0.002	< 0.000500 U	NA	< 0.000500 U	NA	NA	NA	< 0.000500 U	NA	NA	< 0.000500 U	< 0.000500 U	< 0.000500 U	NA	NA	NA	NA	< 0.000500 U	< 0.000500 U	< 0.000500 U
Vanadium	mg/L	0.72	0.000987 J	NA	< 0.00100 U	NA	NA	NA	0.00207 J	NA	NA	0.00186 J	0.00182 J	0.00337 J	NA	NA	NA	NA	0.00209 J	0.00153 J	0.00164 J
Zinc	mg/L	31	0.00680	NA	0.761	NA	NA	NA	0.0123	NA	NA	0.0199	0.0181	0.00329 J	NA	NA	NA	NA	0.00554	0.0229	0.0228
Mercury	mg/L	0.002	< 0.000100 U	NA	< 0.000100 U	NA	NA	NA	< 0.000100 U	NA	NA	< 0.000100 U	< 0.000100 U	< 0.000100 U	NA	NA	NA	NA	< 0.000100 U	0.0000340 J	0.0000310 J
1,4-Dioxane (8270D SIM)																					
1,4-Dioxane	µg/L	9.1	0.71	0.13	390	23	0.37	NA	NA	NA	NA	4.9	4.4	NA	NA	NA	0.7	48	NA	1.8	0.71

Notes:
 Blue highlighting indicates concentrations above the MCL/MSL/PCL
 MCL/MSL - Maximum Contaminant Limit/Medium-Specific Concentrations/Protective Concentration Level
 NA - Not Analyzed
 µg/L - micrograms per liter
 mg/L - milligrams per liter
 J - Estimated: The analyte was positively identified, the quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.
 UJ - The analyte was not detected; however, the result is estimated due to discrepancies in meeting certain analyte-specific quality control criteria.
 U - Undetected: The analyte was analyzed for, but not detected.
 UB - considered a non-detect due to blank contamination
 NV - No Value
 *Perchlorate, manganese, and nickel compared to the PCL
 ** Value is for total xylenes
 PCL - Texas Risk Reduction Program (TRRP) Tier 1 Groundwater Residenti
 a - duplicate sample

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Table 7. Weekly Perchlorate Sample Results-4th Quarter 2019

Sample Identification	Lab Package	Date Sampled	Sample Location	Harrison Bayou Maximum Allowable Daily Discharge Perchlorate Concentration (µg/L)	INF Pond Discharge Criteria for Perchlorate (µg/L)	Reporting Limit	Influent Perchlorate (6850)	Effluent Perchlorate (6850)		Does Concentration Meet Discharge Limit? (Yes/No)	No Daily Maximum Concentration		
							Result (µg/L)	Result (µg/L)	DVQ		Ammonia as N (350.3) (mg/L)	Ortho-Phosphate (365.3) (mg/L)	Organic Carbon (SM5310C) (mg/L)
LH18/24-SP650_100119/AIX	HS19100171	10/1/2019	TK-650	589	17	4	NA	< 2.0	U	Yes	5.2	1.33	1.83
LH18/24-SP650_100819/AIX	HS19100472	10/8/2019	TK-650	589	17	4	NA	6.9		Yes	0.32	3.36	2.14
LH18/24-SP650_100819/AIX (monthly)	HS19100471	10/8/2019	TK-650	589	17	4	NA	6.0		Yes	--	--	--
LH18/24-SP140_100819 (monthly)	HS19100469	10/8/2019	TK-140	--	--	NA	12,000	NA		NA	--	--	--
LH18/24-SP650_101519/AIX	HS19100916	10/15/2019	TK-650	589	17	4	NA	< 2.0	U	Yes	18	2.54	1.3
LH18/24-SP650_102219/AIX	HS19101325	10/22/2019	TK-650	589	17	4	NA	1.7	J	Yes	5.9	4.06	1.56
LH18/24-SP650_102919	HS19101768	10/29/2019	TK-650	589	17	4	NA	NA		NA	7.8	2.17	4.2
LH18/24-SP650_102919_AIX	HS19101773	10/29/2019	TK-650	589	17	4	NA	< 2.0	U	Yes	--	--	--
LH18/24-SP650_110519	HS19110208	11/5/2019	TK-650	589	17	4	NA	< 2.0	U	Yes	13	2.2	1.98
LH18/24-SP650_110519_AIX (monthly)	HS19110211	11/5/2019	TK-650	589	17	4	NA	< 2.0	U	Yes	--	--	--
LH18/24-SP140_110519 (monthly)	HS19110207	11/5/2019	TK-140	--	--	NA	10,000	NA		NA	--	--	--
LH18/24-SP650_111219/AIX	HS19110615	11/12/2019	TK-650	589	17	4	NA	< 2.0	U	Yes	7.5	1.59	1.23
LH18/24-SP650_112019/AIX	HS19111039	11/20/2019	TK-650	589	17	4	NA	11		Yes	4.6	0.833	0.90
LH18/24-SP650_112619/AIX	HS19111389	11/26/2019	TK-650	589	17	4	NA	< 2.0	U	Yes	3.5	0.518	1.3
LH18/24-SP650_120319/AIX	HS19120110	12/3/2019	TK-650	589	17	4	NA	1.2	J	Yes	3.9	0.733	1.5
LH18/24-SP650_120319_AIX (monthly)	HS19120107	12/3/2019	TK-650	589	17	4	NA	1.3	J	Yes	--	--	--
LH18/24-SP140_120319 (monthly)	HS19120109	12/3/2019	TK-140	--	--	NA	11,000	NA		NA	--	--	--
LH18/24-SP650_121219/AIX	HS19120679	12/12/2019	TK-650	589	17	4	NA	< 2.0	U	Yes	8	1.23	0.99 J
LH18/24-SP650_121719/BIX	HS19121001	12/17/2019	TK-650	589	17	4	NA	1.7	J	Yes	0.35	0.0110 J	2.19
LH18/24-SP650_121719_BIX (quarterly)	HS19121029	12/17/2019	TK-650	589	17	4	NA	1.9	J	Yes	--	--	--
LH18/24-SP140_121719 (quarterly)	HS19121028	12/17/2019	TK-140	--	--	NA	14,000	NA		NA	--	--	--
LH18/24-SP650_122319/BIX	HS19121315	12/23/2019	TK-650	589	17	4	NA	6.7		Yes	4.3	0.613	2.46
LH18/24-SP650_123019/BIX	HS19121486	12/30/2019	TK-650	589	17	4	NA	< 2.0	U	Yes	2.1	0.537	2.13

Notes:

Texas Risk Reduction Program (TRRP) Tier 1 Groundwater Residential Protective Concentration Level (PCL)

SP140 samples are influent samples.

µg/L - micrograms per liter

DVQ - data validation qualifier

J - Estimated concentration between the detection limit and limit of quantitation and/or due to quality control discrepancies

NA - not applicable

U - non detect and reported to the limit of detection

BIX - before ion exchange

mg/L - milligrams per liter

AIX - after the ion exchange

GWTP QUARTERLY EVALUATION REPORT -4TH QUARTER 2019
LONGHORN ARMY AMMUNITION PLANT

Table 8. Bi-Weekly GWTP Analytical Sampling Results for October 2019

Sample Location Sample Identification	EFFLUENT-Biweekly			EFFLUENT-Monthly		INFLUENT-Monthly*		EFFLUENT-Biweekly		EFFLUENT-Biweekly		EFFLUENT-Biweekly		EFFLUENT-Biweekly		EFFLUENT-Biweekly		Does Concentration Meet Effluent Discharge Limits? (Yes/No)		
	LH18/24-SP650_100119			LH18/24-SP650_100819		LH18/24-SP140_100819		LH18/24-SP650_101019		LH18/24-SP650_101519		LH18/24-SP650_101719		LH18/24-SP650_102419		LH18/24-SP650_102919				
	HS19100181			HS19100471		HS19100469		HS19100680		HS19100919		HS19101087		HS19101506		HS19101774				
Lab Package	10/1/2019			10/8/2019		10/8/2019		10/10/2019		10/15/2019		10/17/2019		10/24/2019		10/29/2019***		Sample Type		
Sample Date	GRAB			GRAB		GRAB		GRAB		GRAB		GRAB		GRAB		GRAB				
Sample Type	GRAB			GRAB		GRAB		GRAB		GRAB		GRAB		GRAB		GRAB				
Effluent Limitation for Discharge (µg/L) per Table 2 of ROD				Result	DVQ	Result	DVQ	Result	DVQ	Result	DVQ	Result	DVQ	Result	DVQ	Result	DVQ	Result	DVQ	
	Daily Average Concentration	Daily Maximum Concentration	INF Pond MCL																	
VOLATILES	µg/L	µg/L	µg/L																	
1,1,1-Trichloroethane	3,417	7,230	200	1.0	U	0.5	U	NA		1.0	U	NA		0.50	U	0.50	U	0.50	U	Yes
1,1,2-Trichloroethane	102.5	216.9	5	1.0	U	0.5	U	NA		1.0	U	NA		0.50	U	0.50	U	0.50	U	Yes
1,1-Dichloroethane	6,633	14,032	NV	1.0	U	0.5	U	NA		1.0	U	NA		0.50	UJ	0.50	U	0.50	U	Yes
1,1-Dichloroethene	119	253	7	1.0	U	0.5	U	NA		1.0	U	NA		0.50	U	0.50	U	0.50	U	Yes
1,2-Dichloroethane	85	181	5	0.37	UB	0.5	U	NA		1.0	U	NA		1.2		1.4		1.0		Yes
1,2-Dichloropropane	NA	NA	5	1.0	U	0.5	U	NA		1.0	U	NA		0.50	UJ	0.50	U	0.50	U	Yes
Acetone	1,132	2,395	NV	5.1	UB	44	UB	NA		5.3		NA		0.50	U	0.50	U	0.50	U	Yes
Benzene	85	181	5	1.0	U	0.5	U	NA		1.0	U	NA		0.50	U	0.50	U	0.50	U	Yes
Carbon Tetrachloride	85	181	5	1.0	U	0.5	U	NA		1.0	U	NA		0.50	U	0.50	U	0.50	U	Yes
Chlorobenzene	22,300	47,180	100	1.0	U	0.5	U	NA		1.0	U	NA		0.50	U	0.50	U	0.50	U	Yes
Chloroform	1,708	3,615	NV	1.0	U	0.5	U	NA		1.0	U	NA		0.50	UJ	0.50	U	0.50	U	Yes
cis-1,2-Dichloroethene	NV	NV	70	2.2		1.8		NA		2.4		NA		12	J	21		30		Yes
Ethylbenzene	26,954	57,025	700	1.0	U	0.5	U	NA		1.0	U	NA		0.50	U	0.50	U	0.50	U	Yes
m,p-Xylenes	39.5	83.6	NV	2.0	U	1.0	U	NA		2.0	U	NA		1.0	U	1.0	U	0.50	U	Yes
Methylene Chloride	803	1,699	5	1.0	U	1.0	U	NA		1.0	U	NA		1.0	U	22		14		Yes
o-Xylene	39.5	83.6	NV	1.0	U	0.5	U	NA		1.0	U	NA		0.50	U	0.50	U	0.50	U	Yes
Styrene	2,829	5,987	100	1.0	U	0.5	U	NA		1.0	U	NA		0.50	U	0.50	U	0.50	U	Yes
Tetrachloroethene	85.4	180.7	5	1.0	U	0.5	U	NA		1.0	U	NA		0.50	U	0.50	U	0.50	U	Yes
Toluene	1,980	4,189	10	1.0	U	0.5	U	NA		1.0	U	NA		0.50	U	0.50	U	0.50	U	Yes
Trichloroethene	85	181	5	0.98	J	0.80	J	NA		1.2		NA		1.0		1.7		5.1		Yes
Vinyl Chloride	34	72	2	1.0	U	0.5	U	NA		1.0	U	NA		0.50	U	1.3		1.2		Yes
ANIONS	mg/L	mg/L	mg/L			mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		
Chloride	NV	NV	NV	496		NA		NA		NA		444		NA		NA		548		NA
Sulfate	NV	NV	NV	101		NA		NA		NA		118		NA		NA		62.6		NA
PERCHLORATE	µg/L	µg/L	µg/L			µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		
Perchlorate	278	589	17	NA		6		12,000		NA		NA		NA		NA		NA		Yes
METALS	mg/L	mg/L	mg/L			mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		
Hexavalent Chromium	0.058	0.124	NV	NA		0.00900	J	< 0.0100	U	NA		NA		NA		NA		NA		Yes
Barium	1	2	2	NA		0.0770		NA		NA		NA		NA		NA		NA		Yes
Lead	0.0022	0.0046	0.015	NA		< 0.00100	U	NA		NA		NA		NA		NA		NA		Yes
Selenium	0.0057	0.0120	0.05	NA		< 0.00250	U	< 0.00250	U	NA		NA		NA		NA		NA		Yes
Silver	0.0014	0.0030	0.1	NA		< 0.000500	U	< 0.000500	U	NA		NA		NA		NA		NA		Yes
SEMI-VOLATILES	µg/L	µg/L	µg/L			µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		
1,4-Dioxane**	NV	134.2	NV	NA		23		NA		NA		NA		NA		NA		NA		Yes

Notes:
 µg/L - micrograms per liter
 mg/L - milligrams per liter
 DVQ - data validation qualifier
 NA - not applicable or not analyzed
 GWTP - Groundwater Treatment Plant
 ROD - Record of Decision
 Grab samples are compared to the daily maximum and composite samples to the daily average.
 U - not detected and reported to the limit of detection
 J - estimated concentration and/or due to QC discrepancies
 UJ - estimated not detected due to QC discrepancies and reported to the limit of detection
 *Influent sample not compared to discharge limits
 NV - no value
 ** Calculated Effluent Limit
 ***no exceedances; released to Harrison Bayou
 UB - considered an artifact of blank contamination
 MCL - Maximum Contaminant Level

GWTP QUARTERLY EVALUATION REPORT –4TH QUARTER 2019 LONGHORN ARMY AMMUNITION PLANT

Table 9. Bi-Weekly GWTP Analytical Sampling Results for November 2019

Sample Location	EFFLUENT - Monthly			EFFLUENT - Monthly			EFFLUENT - Monthly			INFLUENT - Monthly*			EFFLUENT - Biweekly			EFFLUENT - Biweekly			Does Concentration Meet Effluent Discharge Limits? (Yes/No)
	LH18/24-SP650_BIX			LH18/24-SP650_AIX			LH18/24-SP650_110519			LH18/24-SP140_110519			LH18/24-SP650_111219			LH18/24-SP650_112619			
	Lab Package			Lab Package			Lab Package			Lab Package			Lab Package			Lab Package			
Sample Date	HS19110215			HS19110215			HS19110211			HS19110207			HS19110613			HS19111401			
Sample Type	11/5/2019			11/5/2019			11/5/2019			11/5/2019			11/12/2019			11/26/2019***			
Effluent Limitation for Discharge (µg/L) per Table 2 of ROD			GRAB			GRAB			GRAB			GRAB			GRAB				
Concentration	Daily Average	Daily Maximum	INF Pond MCL	Result	DVQ	Result	DVQ	Result	DVQ	Result	DVQ	Result	DVQ	Result	DVQ	Result	DVQ		
	µg/L	µg/L	µg/L															µg/L	µg/L
VOLATILES																			
1,1,1-Trichloroethane	3,417	7,230	200	0.50	U	0.50	U	NA		NA		0.50	U	0.50	U	0.50	U	Yes	
1,1,2-Trichloroethane	102.5	216.9	5	0.50	U	0.50	U	NA		NA		0.50	U	0.50	U	0.50	U	Yes	
1,1,2-Dichloroethane	6,633	14,032	NV	0.50	UJ	0.50	U	NA		NA		0.50	U	0.50	U	0.50	U	Yes	
1,1-Dichloroethene	119	253	7	0.50	U	0.50	U	NA		NA		0.50	U	0.50	U	0.50	U	Yes	
1,2-Dichloroethane	85	181	5	2.8		1.3		NA		NA		2.1		1.7				Yes	
1,2-Dichloropropane	NA	NA	5	0.50	UJ	0.50	U	NA		NA		0.50	U	0.50	U	0.50	U	Yes	
Acetone	1,132	2,395	NV	1.0	U	1.0	U	NA		NA		1.0	U	1.0	U	1.0	U	Yes	
Benzene	85	181	5	0.50	UJ	0.50	U	NA		NA		0.50	U	0.50	U	0.50	U	Yes	
Carbon Tetrachloride	85	181	5	0.50	U	0.50	U	NA		NA		0.50	U	0.50	U	0.50	U	Yes	
Chlorobenzene	22,300	47,180	100	0.50	U	0.50	U	NA		NA		0.50	U	0.50	U	0.50	U	Yes	
Chloroform	1,708	3,615	NV	0.50	U	0.50	U	NA		NA		0.50	U	0.50	U	0.50	U	Yes	
cis-1,2-Dichloroethene	NV	NV	70	53		38		NA		NA		64		63				Yes	
Ethylbenzene	26,954	57,025	700	0.50	U	0.50	U	NA		NA		0.50	U	0.50	U	0.50	U	Yes	
m,p-Xylenes	39.5	83.6	NV	1.0	U	1.0	U	NA		NA		1.0	U	1.0	U	1.0	U	Yes	
Methylene Chloride	803	1,699	5	21		16		NA		NA		16		6.0				No	
o-Xylene	39.5	83.6	NV	0.50	U	0.50	U	NA		NA		0.50	U	0.50	U	0.50	U	Yes	
Styrene	2,829	5,987	100	0.50	U	0.50	U	NA		NA		0.50	U	0.50	U	0.50	U	Yes	
Tetrachloroethene	85.4	180.7	5	0.50	U	0.50	U	NA		NA		0.50	U	0.50	U	0.50	U	Yes	
Toluene	1,980	4,189	10	0.50	U	0.50	U	NA		NA		0.50	U	0.50	U	0.50	U	Yes	
Trichloroethene	85	181	5	15		7.1		NA		NA		12		12				No	
Vinyl Chloride	34	72	2	0.50	U	0.87	J	NA		NA		1.7		0.66	J			Yes	
ANIONS																			
Chloride	NV	NV	NV	NA		NA		NA		NA		528		403				NA	
Sulfate	NV	NV	NV	NA		NA		NA		NA		34.8		33.5				NA	
PERCHLORATE																			
Perchlorate	278	589	17	NA		NA		< 2.0	U	10,000		NA		NA				Yes	
METALS																			
Hexavalent Chromium	0.058	0.124	NV	NA		NA		< 0.0100	U	< 0.0100	U	NA		NA				Yes	
Barium	1	2	2	NA		NA		0.214		NA		NA		NA				Yes	
Lead	0.0022	0.0046	0.015	NA		NA		< 0.00100	U	NA		NA		NA				Yes	
Selenium	0.0057	0.0120	0.05	NA		NA		< 0.00250	U	< 0.00250	U	NA		NA				Yes	
Silver	0.0014	0.0030	0.1	NA		NA		< 0.000500	U	< 0.000500	U	NA		NA				Yes	
SEMI-VOLATILES																			
1,4-Dioxane**	NV	134.2	NV	NA		NA		11		NA		NA		NA				Yes	

Notes:
 µg/L - micrograms per liter mg/L - milligrams per liter
 DVQ - data validation qualifier ROD - Record of Decision
 GWTP - Groundwater Treatment Plant *Influent sample not compared to discharge limits
 NA - not applicable or not analyzed U - not detected and reported to the limit of detection
 Grab samples are compared to the daily maximum and composite samples to the daily average.
 ** Calculated Effluent Limit ***released to INF Pond
 J - estimated concentration and/or due to QC discrepancies
 Exceeded Maximum Contaminant Level (MCL); discharged to INF Pond

GWTP QUARTERLY EVALUATION REPORT –4TH QUARTER 2019
LONGHORN ARMY AMMUNITION PLANT

Table 10. Bi-Weekly Analytical GWTP Sampling Results for December 2019

Sample Location Sample Identification Lab Package Sample Date Sample Type				INFLUENT - Monthly*	EFFLUENT - Monthly		EFFLUENT - Biweekly***		EFFLUENT - Biweekly***		INF Pond Inlet***		EFFLUENT - Biweekly		
				LH18/24-SP140_120319	LH18/24-SP650_120319	LH18/24-SP650_120419_BIX	LH18/24-SP650_120419_AIX	INF Inlet_120419	LH18/24-SP650_121219						
				HS19120109	HS19120107		HS19120180		HS19120180		HS19120180		HS19120678		
				12/3/2019	12/3/2019		12/4/2019		12/4/2019		12/4/2019		12/12/2019		
				GRAB	GRAB		GRAB		GRAB		GRAB		GRAB		
Effluent Limitation for Discharge (µg/L) per Table 2 of ROD				Result	DVQ	Result	DVQ	Result	DVQ	Result	DVQ	Result	DVQ	Result	DVQ
Daily Average Concentration	Daily Maximum Concentration	INF Pond MCL													
VOLATILES	µg/L	µg/L	µg/L					µg/L							
1,1,1-Trichloroethane	3,417	7,230	200	NA		< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
1,1,2-Trichloroethane	102.5	216.9	5	NA		< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
1,1-Dichloroethane	6,633	14,032	NV	NA		< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
1,1-Dichloroethene	119	253	7	NA		< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	UJ
1,2-Dichloroethane	85	181	5	NA		1.4		1.9		1.5		< 0.5	U	1.3	
1,2-Dichloropropane	NA	NA	5	NA		< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Acetone	1,132	2,395	NV	NA		< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Benzene	85	181	5	NA		< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Carbon Tetrachloride	85	181	5	NA		< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Chlorobenzene	22,300	47,180	100	NA		< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Chloroform	1,708	3,615	NV	NA		< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
cis-1,2-Dichloroethene	NV	NV	70	NA		46		41		55		2.8		38	
Ethylbenzene	26,954	57,025	700	NA		< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
m,p-Xylenes	39.5	83.6	NV	NA		< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
Methylene Chloride	803	1,699	5	NA		4.1		7.0		4.3		< 0.5	U	1.9	J
o-Xylene	39.5	83.6	NV	NA		< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Styrene	2,829	5,987	100	NA		< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Tetrachloroethene	85.4	180.7	5	NA		< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Toluene	1,980	4,189	10	NA		< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Trichloroethene	85	181	5	NA		9.3		6.8		9.5		< 0.5	U	6.8	
Vinyl Chloride	34	72	2	NA		0.65	J	0.54	J	0.62	J	< 0.5	U	0.49	J
ANIONS	mg/L	mg/L	mg/L	mg/L		mg/L		mg/L		mg/L		mg/L		mg/L	
Chloride	NV	NV	NV	NA		NA		NA		NA		NA		NA	
Sulfate	NV	NV	NV	NA		NA		NA		NA		NA		NA	
PERCHLORATE	µg/L	µg/L	µg/L	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L	
Perchlorate	278	589	17	11,000		1.3	J	NA		NA		NA		NA	
METALS	mg/L	mg/L	mg/L	mg/L		mg/L		mg/L		mg/L		mg/L		mg/L	
Hexavalent Chromium	0.058	0.124	NV	< 0.0100	U	< 0.0100	U	NA		NA		NA		NA	
Barium	1	2	2	NA		0.117	J	NA		NA		NA		NA	
Lead	0.0022	0.0046	0.015	NA		< 0.00100	UJ	NA		NA		NA		NA	
Selenium	0.0057	0.0120	0.05	0.00126	J	< 0.00250	U	NA		NA		NA		NA	
Silver	0.0014	0.0030	0.1	< 0.000500	U	< 0.000500	UJ	NA		NA		NA		NA	
SEMI-VOLATILES	µg/L	µg/L	µg/L	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L	
1,4-Dioxane**	NV	134.2	NV	NA		20		NA		NA		NA		NA	

Notes:

µg/L - micrograms per liter; mg/L - milligrams per liter

DVQ - data validation qualifier; ROD - Record of Decision

GWTP - Groundwater Treatment Plant; NA - Not applicable or not analyzed

U - Non detect reported to the limit of detection

UJ - estimated not detected due to QC discrepancies and reported to the limit of detection

J - estimated concentration between the detection limit and limit of quantitation and/or due to quality control discrepancy

Grab samples are compared to the daily maximum and composite samples to the daily average.

* Influent sample not compared to discharge limits

** Calculated Effluent Limit

***The biweekly effluent results for methylene chloride and trichloroethene (TCE) exceeded the screening criteria for discharge to the INF Pond on 11/26/19 and the monthly effluent result for TCE exceeded on 12/3/19. These samples were collected to evaluate the Ion Exchange Vessel's ability to remove these contaminants after the rotation of the air stripper blower was changed to correct the improper orientation by the manufacturer.

LONGHORN ARMY AMMUNITION PLANT

Table 10. Bi-Weekly Analytical GWTP Sampling Results for December 2019

Sample Identification	Sample Location			EFFLUENT - Biweekly		EFFLUENT - Biweekly		EFFLUENT - Biweekly		Does Concentration Meet Effluent Discharge Limits? (Yes/No)
	Sample Identification			LH18/24-SP650_122319		LH18/24-SP650_122719		LH18/24-SP650_123019		
	Lab Package			HS19121316		HS19121433		HS19121484		
	Sample Date			12/23/2019		12/27/2019		12/30/2019		
Sample Type			GRAB		GRAB		GRAB			
Effluent Limitation for Discharge (µg/L) per Table 2 of ROD				Result	DVQ	Result	DVQ	Result		DVQ
Daily Average Concentration	Daily Maximum Concentration	INF Pond MCL								
VOLATILES	µg/L	µg/L	µg/L							
1,1,1-Trichloroethane	3,417	7,230	200	< 0.5	U	< 0.5	U	< 0.5	U	Yes
1,1,2-Trichloroethane	102.5	216.9	5	< 0.5	U	< 0.5	U	< 0.5	U	Yes
1,1-Dichloroethane	6,633	14,032	NV	< 0.5	U	< 0.5	U	< 0.5	U	Yes
1,1-Dichloroethene	119	253	7	< 0.5	U	< 0.5	U	< 0.5	U	Yes
1,2-Dichloroethane	85	181	5	1.5		1.6		1.5		Yes
1,2-Dichloropropane	NA	NA	5	< 0.5	U	< 0.5	U	< 0.5	U	Yes
Acetone	1,132	2,395	NV	< 2.0	U	< 2.0	U	< 2.0	U	Yes
Benzene	85	181	5	< 0.5	U	< 0.5	U	< 0.5	U	Yes
Carbon Tetrachloride	85	181	5	< 0.5	U	< 0.5	U	< 0.5	U	Yes
Chlorobenzene	22,300	47,180	100	< 0.5	U	< 0.5	U	< 0.5	U	Yes
Chloroform	1,708	3,615	NV	< 0.5	U	< 0.5	U	< 0.5	U	Yes
cis-1,2-Dichloroethene	NV	NV	70	35		40		32		Yes
Ethylbenzene	26,954	57,025	700	< 0.5	U	< 0.5	U	< 0.5	U	Yes
m,p-Xylenes	39.5	83.6	NV	< 1.0	U	< 1.0	U	< 1.0	U	Yes
Methylene Chloride	803	1,699	5	1.4	J	1.1	J	< 1.0	U	Yes
o-Xylene	39.5	83.6	NV	< 0.5	U	< 0.5	U	< 0.5	U	Yes
Styrene	2,829	5,987	100	< 0.5	U	< 0.5	U	< 0.5	U	Yes
Tetrachloroethene	85.4	180.7	5	< 0.5	U	< 0.5	U	< 0.5	U	Yes
Toluene	1,980	4,189	10	< 0.5	U	< 0.5	U	< 0.5	U	Yes
Trichloroethene	85	181	5	5.4		6.5		4.8		Yes
Vinyl Chloride	34	72	2	0.45	J	0.52	J	< 0.5	U	Yes
ANIONS	mg/L	mg/L	mg/L	mg/L		mg/L		mg/L		
Chloride	NV	NV	NV	457		NA		NA		NA
Sulfate	NV	NV	NV	27.8		NA		NA		NA
PERCHLORATE	µg/L	µg/L	µg/L	µg/L		µg/L		µg/L		
Perchlorate	278	589	17	NA		NA		NA		Yes
METALS	mg/L	mg/L	mg/L	mg/L		mg/L		mg/L		
Hexavalent Chromium	0.058	0.124	NV	NA		NA		NA		Yes
Barium	1	2	2	NA		NA		NA		Yes
Lead	0.0022	0.0046	0.015	NA		NA		NA		Yes
Selenium	0.0057	0.0120	0.05	NA		NA		NA		Yes
Silver	0.0014	0.0030	0.1	NA		NA		NA		Yes
SEMI-VOLATILES	µg/L	µg/L	µg/L	µg/L		µg/L		µg/L		
1,4-Dioxane**	NV	134.2	NV	NA		NA		NA		Yes

Notes:

µg/L - micrograms per liter; mg/L - milligrams per liter

DVQ - data validation qualifier; ROD - Record of Decision

GWTP - Groundwater Treatment Plant; NA - Not applicable or not analyzed

U - Non detect reported to the limit of detection

UJ - estimated not detected due to QC discrepancies and reported to the limit of detection

J - estimated concentration between the detection limit and limit of quantitation and/or due to quality control discrepancy

Grab samples are compared to the daily maximum and composite samples to the daily average.

*Influent sample not compared to discharge limits

** Calculated Effluent Limit

***The biweekly effluent results for methylene chloride and trichloroethene (TCE) exceeded the screening criteria for discharge to the INF Pond on 11/26/19 and the monthly effluent result for TCE exceeded on 12/3/19. These samples were collected to evaluate the Ion Exchange Vessel's ability to remove these contaminants after the rotation of the air stripper blower was changed to correct the improper orientation by the manufacturer.

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Table 11. Quarterly GWTP Analytical Sampling Results

	Sample Location			EFFLUENT		INFLUENT*		Does Concentration Meet Discharge Limits? (Yes/No)
	Sample Identification			LH18/24-SP650_121719/BIX		LH18/24-SP140_121719		
	Lab Package			HS19121029		HS19121028		
	Sample Date			12/17/2019		12/17/2019		
	Sample Type			GRAB		GRAB		
	Effluent Limitation for Discharge (µg/L) per Protocol			Result	DVQ	Result	DVQ	
	Daily Average Concentration	Daily Maximum Concentration	Reporting Limit					
VOLATILES	µg/L	µg/L	µg/L	µg/L		µg/L		
1,1,1-Trichloroethane	3,417	7,230	1	< 0.5	U	< 10	U	Yes
1,1,2-Trichloroethane	102.5	216.9	1	< 0.5	U	< 10	U	Yes
1,1-Dichloroethane	6,633	14,032	1	< 0.5	U	8.5	J	Yes
1,1-Dichloroethene	119	253	1	< 0.5	U	< 10	U	Yes
1,2-Dichloroethane	85	181	1	1.5		43		Yes
1,2-Dichloropropane	NA	NA	1	< 0.5	U	< 10	U	Yes
Acetone	1,132	2,395	2	< 2.0	U	< 20	U	Yes
Benzene	85	181	1	< 0.5	U	< 10	U	Yes
Carbon Tetrachloride	85	181	1	< 0.5	U	< 10	U	Yes
Chlorobenzene	22,300	47,180	1	< 0.5	U	< 10	U	Yes
Chloroform	1,708	3,615	1	< 0.5	U	< 10	U	Yes
Ethylbenzene	26,954	57,025	1	< 0.5	U	< 10	U	Yes
m,p-Xylenes	39.5	83.6	2	< 1.0	U	< 20	U	Yes
Methylene Chloride	803	1,699	2	1.7	J	510		Yes
o-Xylene	39.5	83.6	1	< 0.5	U	< 10	U	Yes
Styrene	2,829	5,987	1	< 0.5	U	< 10	U	Yes
Tetrachloroethene	85.4	180.7	1	< 0.5	U	35		Yes
Toluene	1,980	4,189	1	< 0.5	U	< 10	U	Yes
Trichloroethene	85	181	1	6.8		5,400		Yes
Vinyl Chloride	34	72	1	0.48	J	130		Yes
ANIONS	mg/L	mg/L	mg/L	mg/L		mg/L		
Chloride	NA	NA	10	453		446		NA
Sulfate	NA	NA	10	28.8		26.6		NA
PERCHLORATE	µg/L	µg/L	µg/L	µg/L		µg/L		
Perchlorate	278	589	4	1.9	J	14,000		Yes
METALS	mg/L	mg/L	mg/L	mg/L		mg/L		
Aluminum	0.777	1.644	0.0100	0.0194		0.0275		Yes
Antimony	NA	NA	0.00200	< 0.000500	U	< 0.000500	U	NA
Arsenic	0.365	0.772	0.00200	0.000634	J	0.000872	J	Yes

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Table 11. Quarterly GWTP Analytical Sampling Results

	Sample Location			EFFLUENT		INFLUENT*		Does Concentration Meet Discharge Limits? (Yes/No)
	Sample Identification			LH18/24-SP650_121719/BIX		LH18/24-SP140_121719		
Lab Package			HS19121029		HS19121028			
Sample Date			12/17/2019		12/17/2019			
Sample Type			GRAB		GRAB			
	Effluent Limitation for Discharge (µg/L) per Protocol			Result	DVQ	Result	DVQ	
	Daily Average Concentration	Daily Maximum Concentration	Reporting Limit					
Barium	1	2	0.00400	0.0888		0.766		Yes
Beryllium	NA	NA	0.00200	< 0.000500	U	< 0.000500	U	NA
Cadmium	0.0016	0.0034	0.00200	< 0.000500	U	0.000223	J	Yes
Calcium	NA	NA	0.500	7.99		44.3		NA
Chromium	0.355	0.752	0.00400	0.000428	J	0.00121	J	Yes
Cobalt	5.433	11.495	0.00500	0.00149	J	0.00820		Yes
Iron	1.132	2.395	0.200	0.108	J	0.478		Yes
Lead	0.0022	0.0046	0.00200	< 0.00100	U	< 0.00100	U	Yes
Magnesium	NA	NA	0.200	24.0		34.2		NA
Manganese	7.323	15.494	0.00500	0.104		0.542		Yes
Nickel	0.087	0.184	0.00200	0.00372	J	0.0146		Yes
Potassium	NA	NA	0.200	1.29		1.21		NA
Selenium	0.0057	0.012	0.00200	< 0.00250	U	< 0.00250	U	Yes
Silver	0.0014	0.003	0.00200	< 0.000500	U	< 0.000500	U	Yes
Sodium	NA	NA	1.00	339		211		NA
Thallium	NA	NA	0.00200	< 0.000500	U	0.000326	J	NA
Vanadium	1.698	3.592	0.00500	< 0.00100	U	< 0.00100	U	Yes
Zinc	0.146	0.31	0.00400	0.0172		0.0549		Yes
Mercury	NA	NA	0.000200	< 0.000100	U	< 0.000100	U	NA
1,4-DIOXANE	µg/L	µg/L	µg/L	µg/L		µg/L		
1,4-Dioxane	NA	134.2	1	20.0		20		Yes
CHEMICAL OXYGEN DEMAND (COD)	mg/L	mg/L	mg/L	mg/L		mg/L		
COD	NA	200	75	22		15		Yes
OIL AND GREASE (O&G)	mg/L	mg/L	mg/L	mg/L		mg/L		
O&G	NA	15	2	< 1.0	U	< 1.0	U	Yes

Notes:

µg/L - micrograms per liter

DVQ - data validation qualifier

Grab samples are compared to the daily maximum and composite samples to the daily average

* only Effluent sample is compared to discharge limits

J - Estimated concentration between the detection limit and limit of quantitation and/or due to quality control discrepancy

U - non detect and reported to the limit of detection

mg/L - milligrams per liter

NA - not applicable

GWTP - Groundwater Treatment Plant

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3 QUALITY CONTROL

This report summarizes the data for samples collected during October, November, and December 2019. The samples were reviewed and validated in accordance with the guidelines in the *USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review* (USEPA, January 2017); *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review* (USEPA, January 2017); and the quality control criteria specified in the *Basewide Uniform Federal Policy - Quality Assurance Project Plan Longhorn Army Ammunition Plant* which is in Appendix C of the *Final Installation-Wide Work Plan for Longhorn Army Ammunition Plant Karnack, Texas* (Bhate, May 2018).

The purpose of the sampling program is to evaluate the effectiveness of the groundwater pump and treat system, assess water quality within the capture zone, and assure compliance with the effluent discharge requirements of the Interim ROD. Quality control and quality assurance problems noted in the case narratives received from the laboratory are minor and do not affect the usability of the data for compliance at the GWTP. No sample results from the 4th quarter of 2019 were rejected due to quality control problems.

ALS Environmental analyzed the compliance samples collected from the GWTP. Independent data verification and validation was performed by the Bhate project chemist as described in the Quality Control Summary Report in **Appendix G**. The laboratory reports for the 4th quarter of 2019 sampling conducted at LHAAP-18/24 are included in **Appendix C** on a CD and the laboratory results for the GWTP are included in **Appendix F** on CD. Air monitoring data is presented in **Appendix H** on CD.

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4 TREATED GROUNDWATER DISCHARGED

Reinjection of groundwater in ICT 6 and ICT 9 was discontinued as of 15 July 2012. The last injection occurred on 24 May 2012, immediately prior to the scrubber system malfunction which caused GWTP operation to cease temporarily.

Treated groundwater that met the perchlorate discharge criteria was discharged to Harrison Bayou or the INF Pond in accordance with the Protocol for Discharging GWTP Effluent (**Appendix I**). **Table 4** summarizes daily volume from the INF Pond to the Harrison Bayou, the maximum flow rate allowed by chloride and sulfate concentrations, and the approximate volumes discharged for the 4th quarter of 2019. No treated groundwater was discharged from the GWTP to the Harrison Bayou in October 2019, 115,503 gallons in November 2019, and 318,248 gallons in December 2019. In October, 270,515 gallons were discharged from the GWTP to the INF Pond, along with 151,157 gallons in November 2019 and 36,884 gallons in December 2019.

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5 AIR MONITORING

5.1 Summary of Air Monitoring Approach

Operation of the GWTP without air abatement was approved by the TCEQ and USEPA conditioned on collection of air monitoring data to determine the effect of GWTP operation on ambient air quality with respect to potential human health exposure risk. An Interim Air Monitoring Plan was developed by AECOM in August 2012 and used to implement the air monitoring program. The air monitoring program included sampling emission concentrations from the air stripper, ambient air at the GWTP, and ambient air downwind of the GWTP. Collection of air data occurred on a weekly basis between September 2012 and September 2013, on a monthly basis between September 2013 and September 2014, and on a quarterly basis since that time. The sampling program includes use of Summa canisters and a photoionization detector (PID) to measure vapor phase concentrations. The air stripper emission sample is collected as a grab sample, while the ambient air samples are collected as composite samples. The GWTP sample is collected over 8 hours to represent a work day and the downwind sample is collected over 24 hours to represent potential exposure to an off-site receptor¹. The downwind sample is collected at the closest downwind property boundary, based on prevailing wind direction.

PID data (after system calibration) are collected each time the GWTP is operated and serve as a real-time indicator of ambient air conditions at and downwind of the GWTP. Correlations between definitive analytical air data and PID measurements were established and a means to calculate contaminant concentration from PID measurements was developed. A PID threshold of 0.4 parts per million by volume (ppmv) in ambient air was established, such that Summa canister measurements would occur when the PID threshold is exceeded.

The Summa canister samples are analyzed for VOCs using USEPA Method TO-15. The PID measurements are collected after instrument calibration. The air sampling results are summarized and reported to the USEPA and TCEQ in the GWTP quarterly reports; however, the air results are reviewed immediately upon receipt for the potential presence of any exceedances of ambient air concentrations. **Appendix J (Tables 1 through 3)** includes a comparison of ambient air concentrations with TCEQ Air Monitoring Comparison Values (AMCVs) or the short-term Effects Screening Levels (ESLs) for chemicals with no published AMCVs, calculations of emission rates from the emission point, and a compilation of PID results and calibration records. The air monitoring results to date indicate that all ambient air concentrations are lower than the AMCVs or ESLs. The stripper stack sample concentrations are used to calculate emission rates in pounds

¹ Off-site receptor - Any recreational area, residence, commercial/industrial facility, or other normally occupied structures not used solely by the owner or operator of the facilities or the owner of the site upon which the facilities are located. Measurements of distances to determine compliance with this distance restriction must be taken toward structures that are in use as of the date that a notification is filed with the commission.

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per hour (lbs/hr) and tons per year (tpy). The calculated emission rates in lbs/hr are then compared to the allowable emission rates per 30 Texas Administrative Code (TAC) §106.533(f)(1). The emission rates have been lower than the allowable emission rates to the conservatively-selected off-site receptor. The calculated emission rate in tpy is compared to the allowable limit of 5 tpy per chemical. All emission rates have been lower than the allowable emission rates.

The air monitoring results from the first few months of operation between September and November 2012 were compiled and submitted in a separate report (December 2012) (along with validated data) to TCEQ to demonstrate compliance with Texas Permit by Rule emission standards. Approval of the analytical results and concurrence that the site will continue to meet Title 30 TAC §106.533 without the use of air abatement using a catalytic oxidation system was obtained from the TCEQ via email on 22 February 2013.

On 18 February 2013, AECOM presented analysis of the approach applicable to obtaining a variance for operating the GWTP without air abatement equipment to the TCEQ and USEPA. The analysis indicated that the use of an Explanation of Significant Difference (ESD) was the appropriate approach for the site. Approval of use of an ESD was obtained from the USEPA via email on 21 March 2013. The ESD was developed, reviewed, and accepted by USEPA and TCEQ. The ESD was signed by the designated parties on 3 April 2014, and concurrence from the TCEQ was obtained in a letter dated 16 April 2014.

5.2 Air Monitoring Results for the 4th Quarter of 2019

During the 4th quarter of 2019, air sampling was completed on 16 December 2019. The laboratory data package is presented in **Appendix H**. A summary of the air sampling results is presented in **Appendix J (Tables 1 through 3)**. All results met the criteria described in Section 6.1.

5.2.1 Summa Canister Monitoring Results

One sampling event was conducted on 16 December 2019, for presentation during the 4th Quarter 2019 reporting period using Summa canisters. The samples were collected and analyzed as described in Section 6.1 and per the approved air monitoring plan dated August 2012. The analytical results were then compiled in spreadsheets where calculations were completed and comparisons to applicable criteria were made as described in Section 6.1.

5.2.1.1 Ambient Air Results

Acetone; benzene; cis-1,2-DCE; methylene chloride; alpha-pinene; n-hexane; toluene; propene; styrene; ethylbenzene; m,p-xylenes, o-xylene; dichlorodifluoromethane; ethanol; trichlorofluoromethane; TCE; d-limonene; and trichlorotrifluoroethane were detected in December 2019 in ambient air downwind of the GWTP.

Compounds originating at the GWTP would be expected to have lower concentrations in the downwind sampling location than at the GWTP sampling location. Likewise, compounds like methylene chloride; dichlorodifluoromethane; trichlorofluoromethane; and alpha-pinene with similar concentrations in both GWTP ambient air and downwind ambient air are suspected to be

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present in the ambient (background) air. The ambient air results during the quarter met the ambient air criteria, as presented in **Table 1** within **Appendix J**.

5.2.1.2 Air Stripper Effluent Results

The VOCs present in groundwater that are removed via the air stripper include acetone; 1,1-DCE; 1,2-dichloroethane; carbon disulfide; cis-1,2-DCE; methylene chloride; tetrachloroethene; TCE; VC; and trichlorotrifluoroethane. The highest reported concentrations in December 2019 were for cis-1,2-DCE; trichlorotrifluoroethane; and TCE. These compounds are frequently reported in groundwater at the site, with the exception of trichlorotrifluoroethane which is not typically a groundwater analyte at LHAAP. Trichlorotrifluoroethane, however, appears to be present in groundwater as indicated by limited analysis conducted in December 2013, where it was detected in several wells, and from historical accounts. Many of the chemicals that are reported in ambient air are not detected in the air stripper effluent. This is likely because the reporting limit for the air stripper effluent is higher than the reporting limit for the ambient air samples or the source for some of these chemicals are extraneous to groundwater.

The air stripper effluent concentrations were below the emission criteria, as presented in **Table 2** within **Appendix J**.

5.2.2 PID Results

Along with collection of Summa canister air samples, PID measurements from the same sources/areas are collected and recorded. These simultaneous measurements allowed establishing a correlation between PID readings and VOC concentrations in the Summa canister air samples. Conversion from PID to compound concentrations was established by TCEQ in 30 TAC §106.533(h). The TCEQ equation allows use of a PID to determine individual compound concentrations if the distribution of chemicals in the ambient air is known or assumed. This allows the use of a PID as a tool to measure VOC concentrations and convert the PID results to estimates of compound concentrations. All ambient air PID measurements during this quarter at the GWTP were reported at 0.0 parts per million. The stripper PID location detected between 20.3 and 24.5 parts per million at each sampling event. The other two locations had no detections. The results of the PID readings collected during GWTP operations are presented in **Table 3** within **Appendix J**.

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6 COMMENTS AND RESPONSES

The 3rd Quarter GWTP Evaluation Report was provided to the TCEQ and the USEPA on December 17, 2019.

The TCEQ provided notice on 22 January 2020 that they had no comments on the 3rd Quarter 2019 report.

The USEPA provided the following comment on 30 January 2020:

Comment 1: Page xi, Table ES-1. Discharge Information to Harrison Bayou During 3rd Quarter 2019; The third column of the table displays the “Calculated Maximum Rate Allowable”. Would it be possible to also show the actual release rate?

Response to Comment 1: Discharge varies throughout day and would be an estimate at best. However, it is known that the maximum discharge rate from the INF Pond is 170 GPM and the maximum discharge rate from the GWTP is 30 GPM. We will add a note with this known information to the bottom of Table ES-1 and Table 4 going forward.

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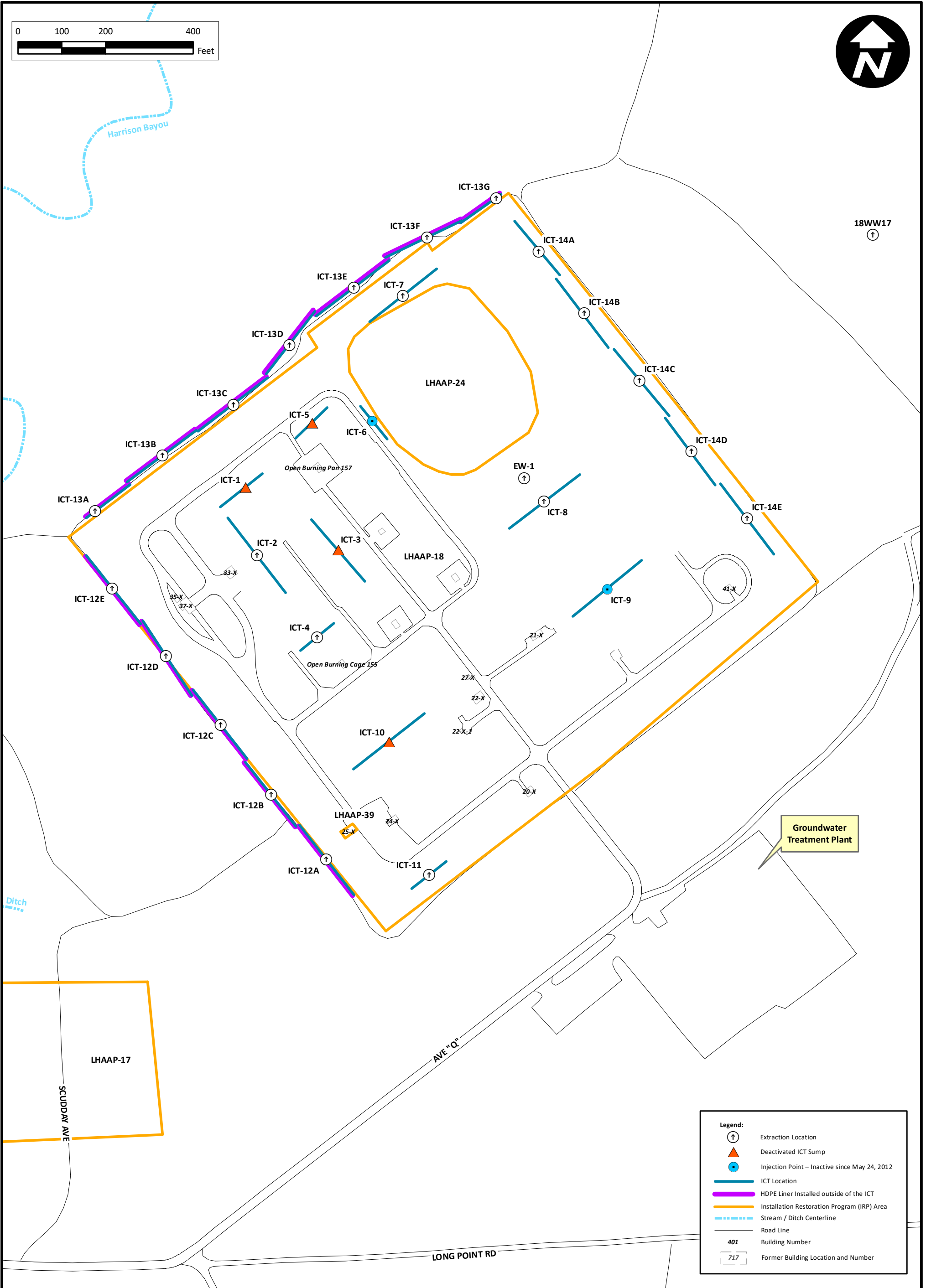
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APPENDIX A
ICT LAYOUT AND GWTP PROCESS FLOW DIAGRAM

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Legend:

- Extraction Location
- Deactivated ICT Sump
- Injection Point – Inactive since May 24, 2012
- ICT Location
- HDPE Liner Installed outside of the ICT
- Installation Restoration Program (IRP) Area
- Stream / Ditch Centerline
- Road Line
- Building Number
- Former Building Location and Number



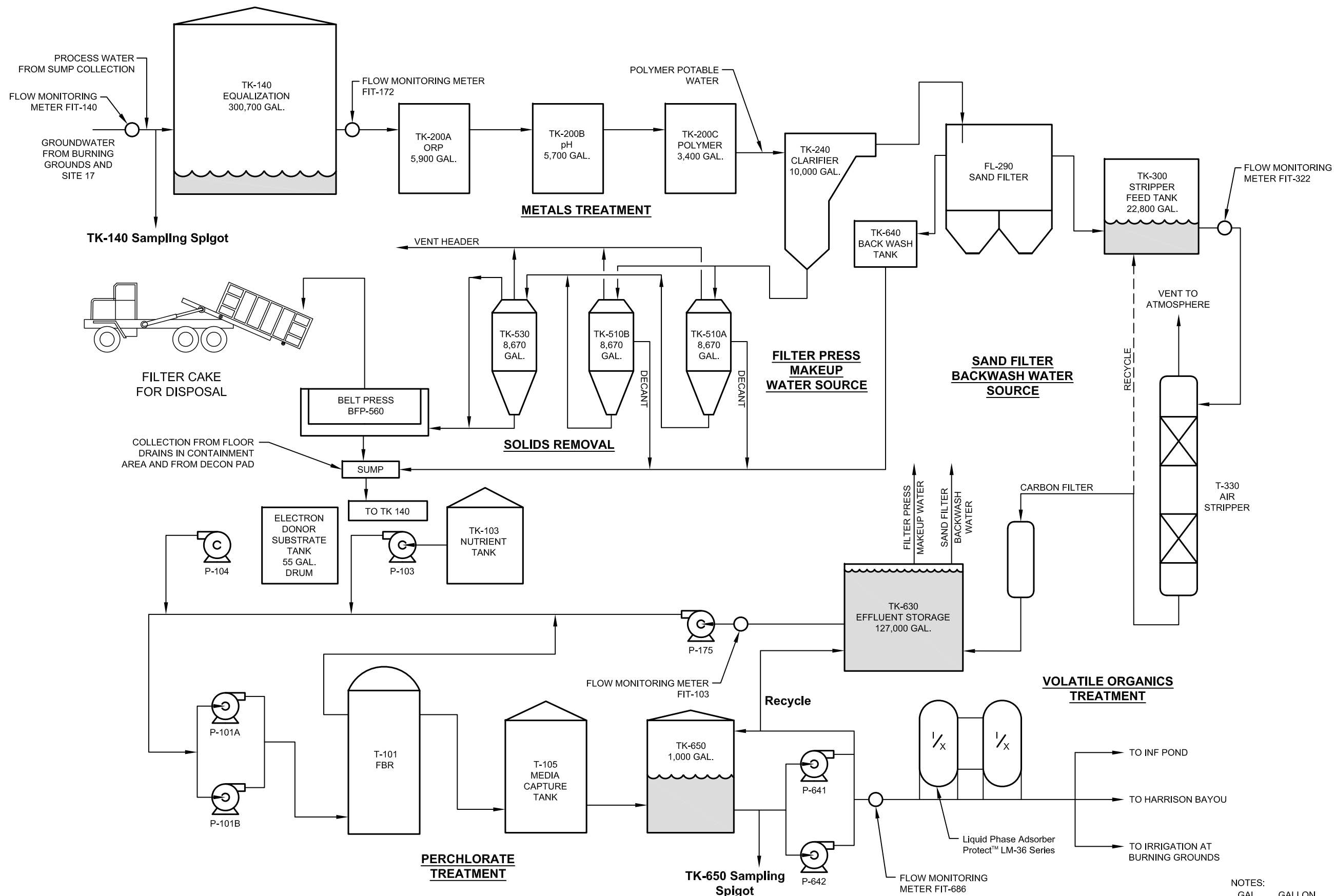
www.bhate.com

Quarterly Evaluation Report
Groundwater Treatment Plant
Longhorn Army Ammunition Plant, Karnack, Texas

PROJECT NO:	SCALE:	DATE:	DRAWN BY:
NWO1312.0150	As Shown	1/31/2020	MRM

ICT Layout Map

Figure A-1



Process Flow Diagram

Figure A-2

Quarterly Evaluation Report
 Groundwater Treatment Plant
 Longhorn Army Ammunition Plant, Karnack, Texas

PROJECT NO:	NW01312.0150
SCALE:	Not to Scale
DATE:	1/31/2020
DRAWN BY:	MRM

- NOTES:
- GAL. GALLON
 - TK or T TANK
 - BFP BELT FILTER PRESS
 - P PUMP
 - FL FILTER
 - FBR FLUIDIZED BED REACTOR
 - 1/X ION EXCHANGE

Table A-1: ICTs Completion Depths

ICT	TOC Elevation	Total Depth	Sump Elevation	Comment
1	186.07	22.5	163.57	Taken out of service in 2007.
2	185.02	29.5	155.52	
3	192.27	37.75	154.52	Taken out of service in 2007.
4	193.51	37.5	156.01	
5	192.67	35	157.67	Taken out of service in 2007.
6	197.30	40.75	156.55	Converted to infiltration in 2007. Ceased reinjection in July 2012.
7	198.03	32.33	165.7	
8	198.97	44.5	154.47	
9	197.64	45.5	152.14	Converted to infiltration in 2007. Ceased reinjection in July 2012.
10	198.07	45.42	152.65	Taken out of service in 2007.
11	198.01	43.33	154.68	
12A	189.06	31.5	157.56	Taken out of service in 2007. Reinstituted in December 2012.
12B	191.97	36.25	155.72	
12C	193.90	34.33	159.57	
12D	185.64	33.75	151.89	
12E	183.38	32.25	151.13	
13A	182.59	28.17	154.42	
13B	184.72	29.58	155.14	
13C	186.13	28.17	157.96	
13D	186.72	26.17	160.55	
13E	191.79	27.08	164.71	
13F	197.81	32.33	165.48	
13G	197.03	27.25	169.78	Taken out of service in 2008.
14A	196.8	43.00	153.8	
14B	197.61	43.42	154.19	
14C	197.86	41.33	156.53	
14D	198.47	44.25	154.22	
14E	198.47	43.08	155.39	

Note(s):

ICT - interception-collection trench

TOC - top of casing, measuring point for groundwater elevations

Elevations are reported as feet above mean sea level.

Total depths are reported as feet below TOC.

Sump elevation calculated by subtracting total depth from TOC elevation.

ICTs were installed in 1998.

ICT 12A was replaced on December 5, 2012, and extraction has resumed.

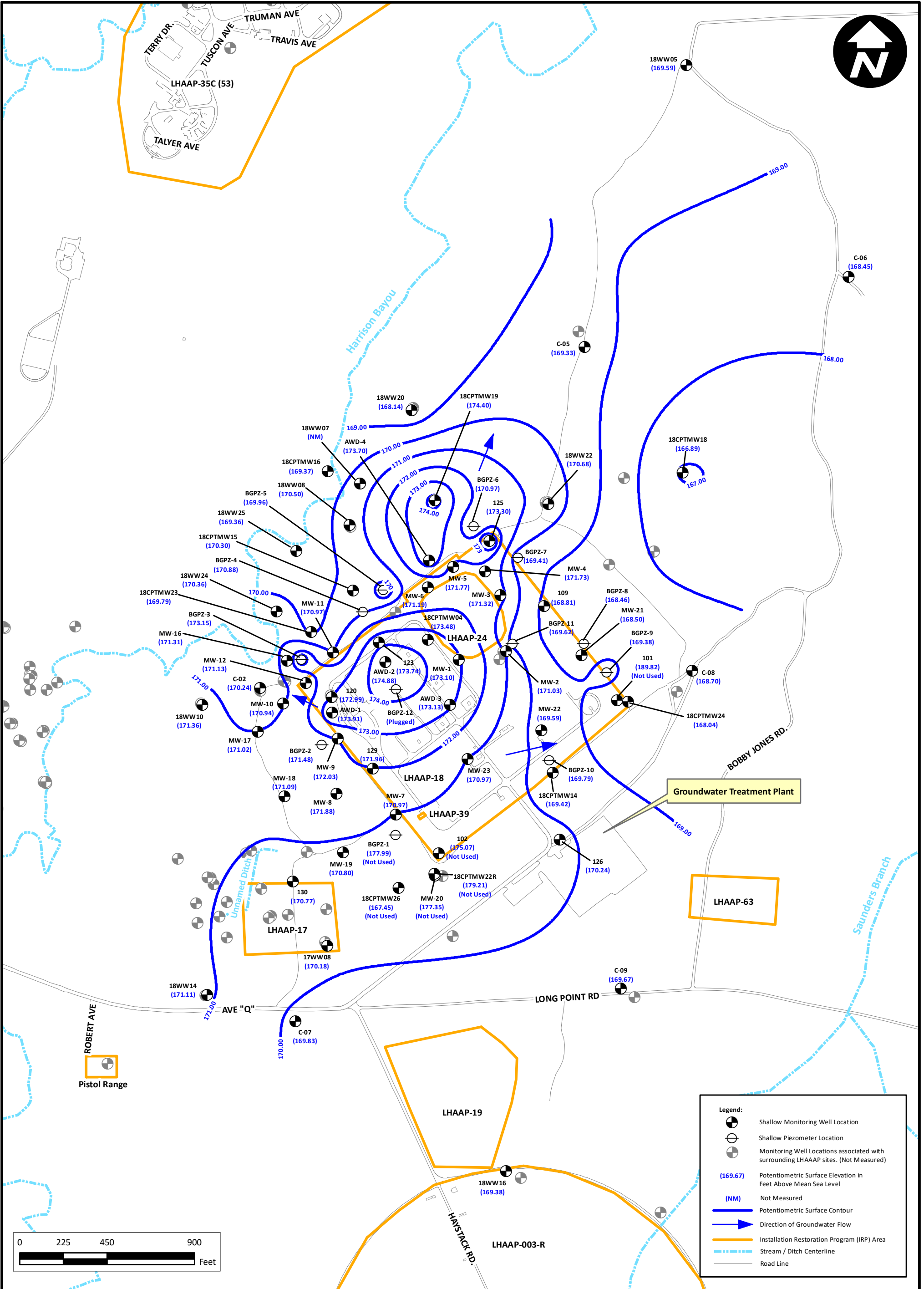
TOC Elevations and total depth measured in October 2003, 4th Quarter 2003, Groundwater Treatment Plant Report.

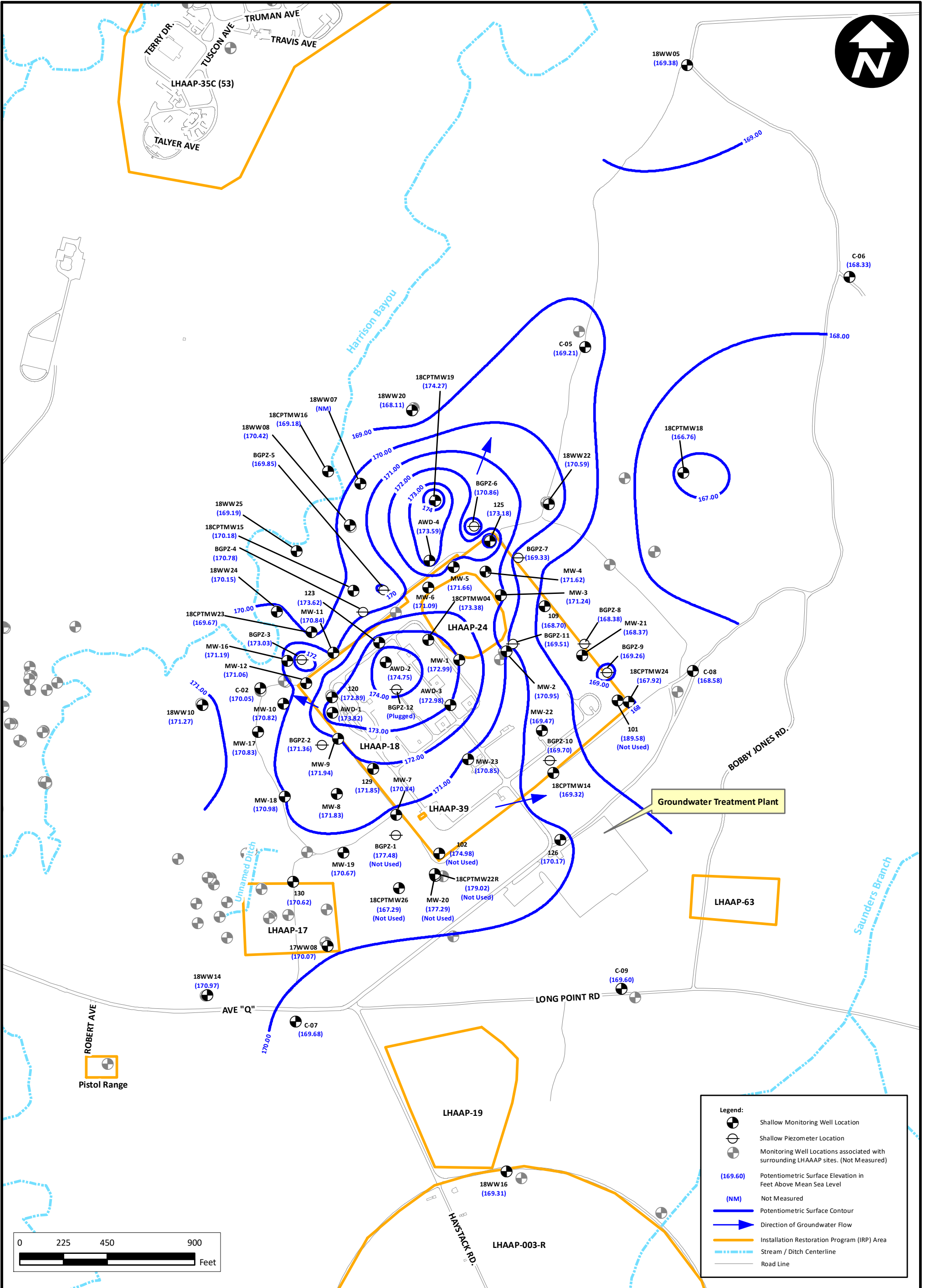
GWTP QUARTERLY EVALUATION REPORT – 4TH QUARTER 2019
LONGHORN ARMY AMMUNITION PLANT

APPENDIX B
GROUNDWATER ELEVATION CONTOUR MAPS

GWTP QUARTERLY EVALUATION REPORT —4TH QUARTER 2019
LONGHORN ARMY AMMUNITION PLANT

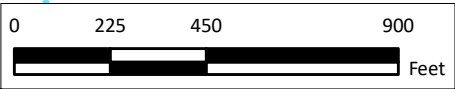
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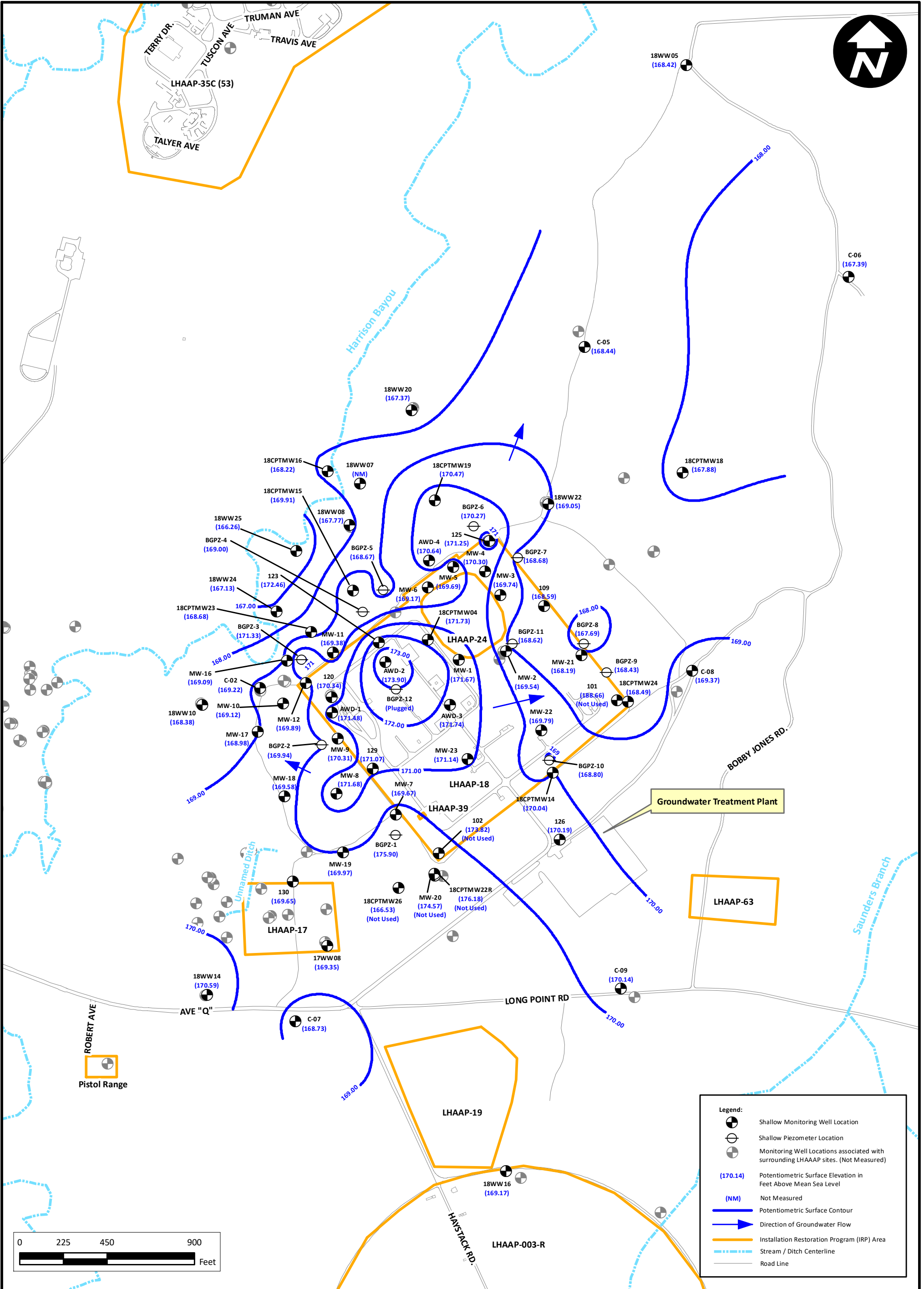


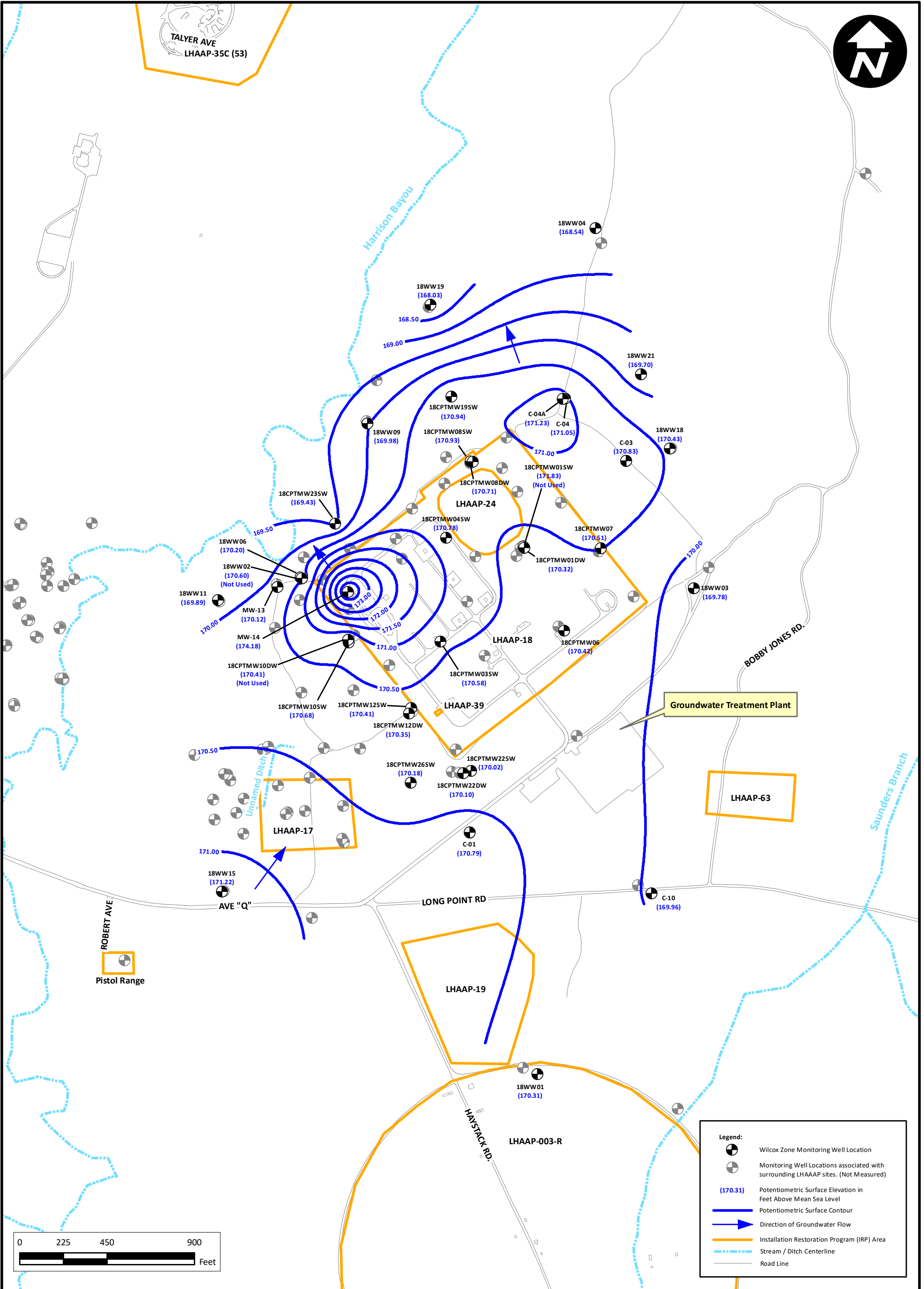


Legend:

- Shallow Monitoring Well Location
- Shallow Piezometer Location
- Monitoring Well Locations associated with surrounding LHAAP sites. (Not Measured)
- (169.60) Potentiometric Surface Elevation in Feet Above Mean Sea Level
- (NM) Not Measured
- Potentiometric Surface Contour
- Direction of Groundwater Flow
- Installation Restoration Program (IRP) Area
- Stream / Ditch Centerline
- Road Line







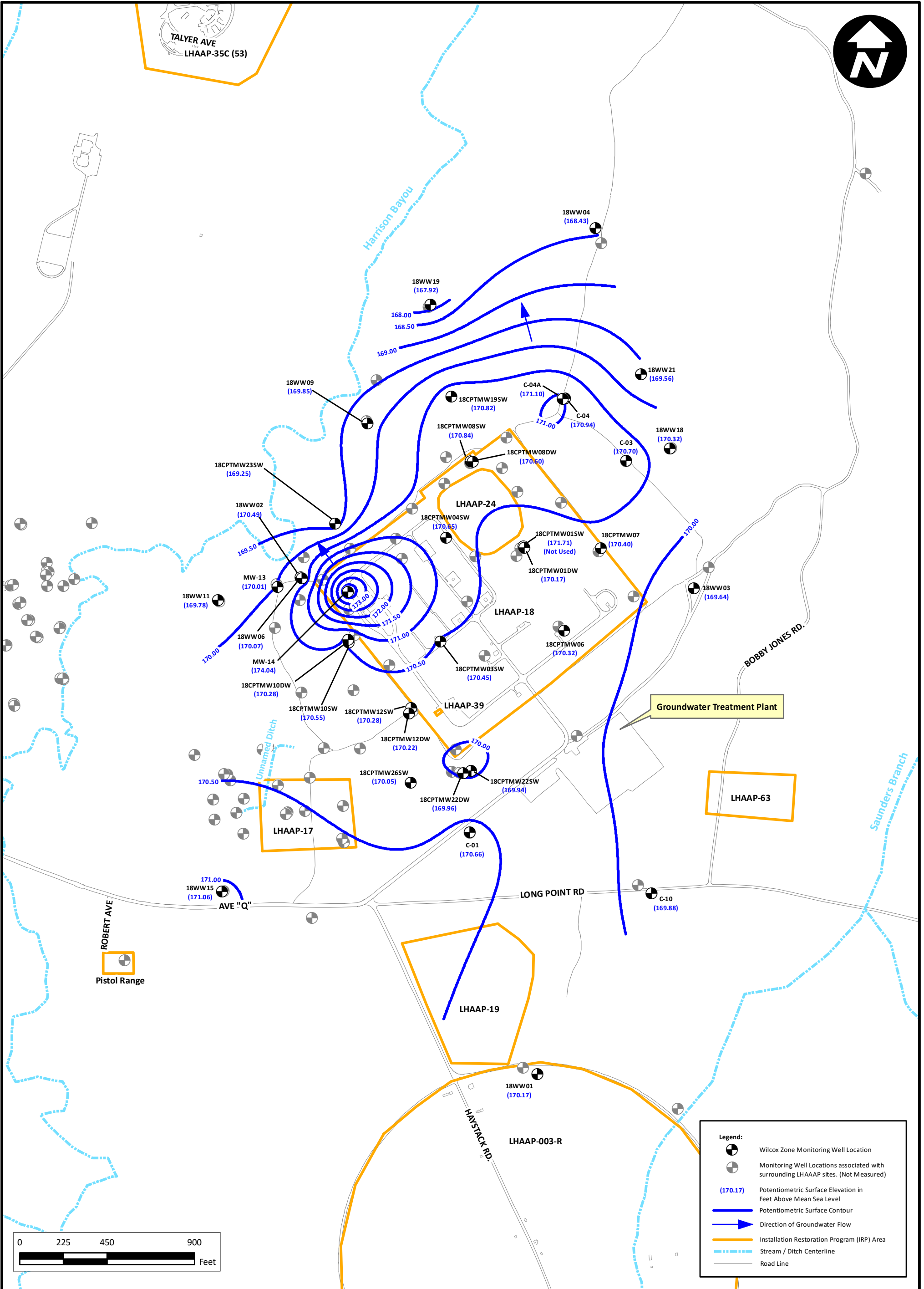
www.bhate.com

Quarterly Evaluation Report 4th Quarter (October – December) 2019
Groundwater Treatment Plant
Longhorn Army Ammunition Plant, Karnack, Texas

PROJECT NO:	SCALE:	DATE:	DRAWN BY:
NWO1312.0150	As Shown	1/31/2020	MRM

Groundwater Potentiometric Surface Map
Wilcox Zone (October 29, 2019) LHAAP-18/24

Figure B-4



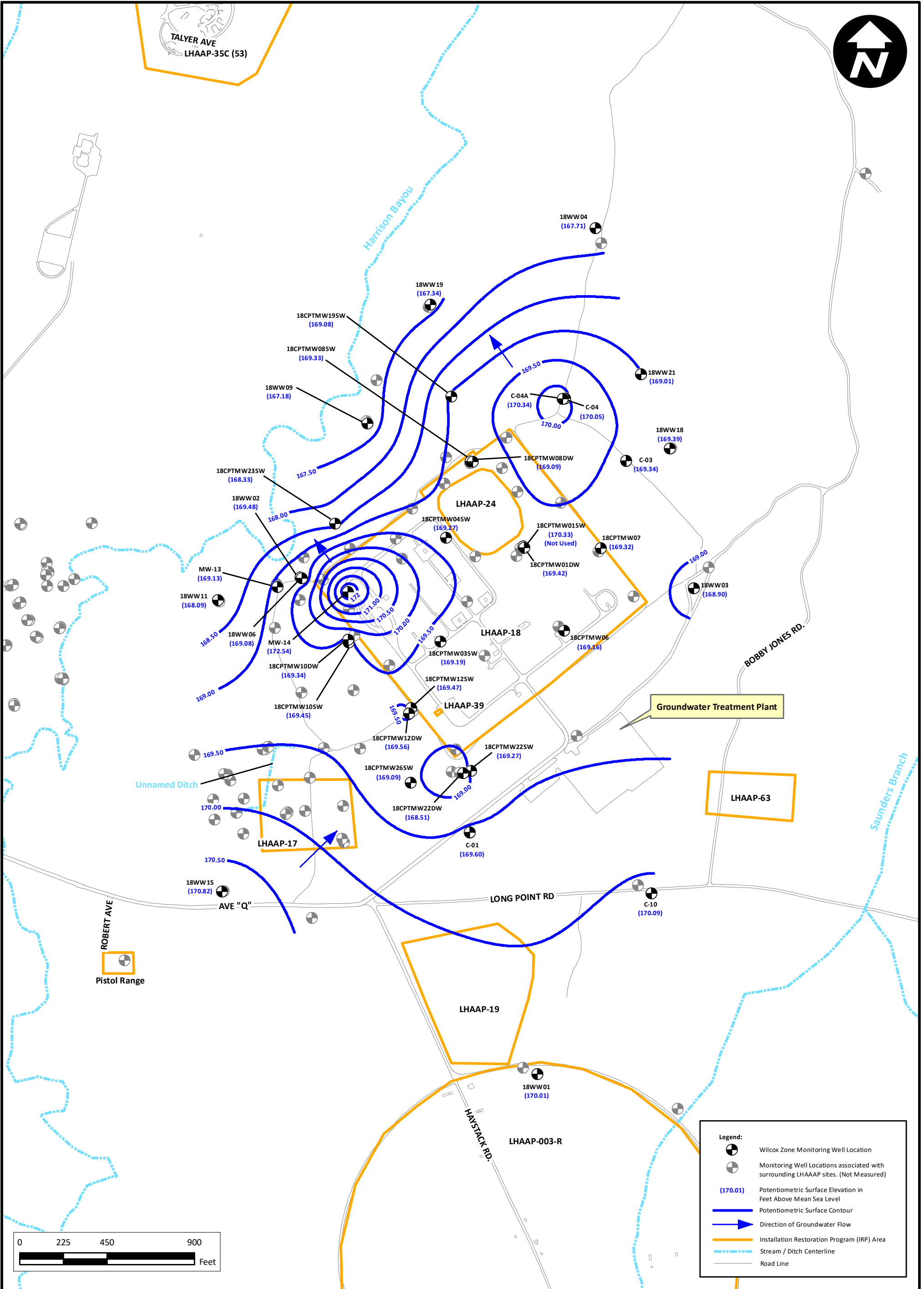
www.bhate.com

Quarterly Evaluation Report 4th Quarter (October – December) 2019
Groundwater Treatment Plant
Longhorn Army Ammunition Plant, Karnack, Texas

PROJECT NO:	SCALE:	DATE:	DRAWN BY:
NWO1312.0150	As Shown	1/31/2020	MRM

Groundwater Potentiometric Surface Map
Wilcox Zone (November 25, 2019) LHAAP-18/24

Figure B-5



GWTP QUARTERLY EVALUATION REPORT – 4TH QUARTER 2019
LONGHORN ARMY AMMUNITION PLANT

APPENDIX C
LABORATORY ANALYTICAL RESULTS FOR LHAAP-18/24
(PROVIDED ON CD ONLY)

GWTP QUARTERLY EVALUATION REPORT –4TH QUARTER 2019
LONGHORN ARMY AMMUNITION PLANT

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

December 23, 2019

Marcia Olive
Bhate Environmental Associates, Inc.
445 Union Blvd Ste 129
Lakewood, CO 80228

Work Order: **HS19120354**

Laboratory Results for: **LHAAP 18 24**

Dear Marcia,

ALS Environmental received 9 sample(s) on Dec 06, 2019 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,

A handwritten signature in black ink, appearing to read "Raj. P. Modashia", enclosed in a circular scribble.

Generated By: JUMOKE.LAWAL
RJ Modashia
Project Manager

ALS Houston, US

Date: 23-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Work Order: HS19120354

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19120354-01	18CPTMW22R_120519	GW		05-Dec-2019 07:50	06-Dec-2019 08:48	<input type="checkbox"/>
HS19120354-02	MW20_120519	GW		05-Dec-2019 08:35	06-Dec-2019 08:48	<input type="checkbox"/>
HS19120354-03	MW20_120519_a	GW		05-Dec-2019 08:35	06-Dec-2019 08:48	<input type="checkbox"/>
HS19120354-04	18CPTMW22SW_120519	GW		05-Dec-2019 09:25	06-Dec-2019 08:48	<input type="checkbox"/>
HS19120354-05	MW8_120519	GW		05-Dec-2019 10:30	06-Dec-2019 08:48	<input type="checkbox"/>
HS19120354-06	MW9_120519	GW		05-Dec-2019 11:30	06-Dec-2019 08:48	<input type="checkbox"/>
HS19120354-07	MW10_120519	GW		05-Dec-2019 12:15	06-Dec-2019 08:48	<input type="checkbox"/>
HS19120354-08	MW17_120519	GW		05-Dec-2019 13:05	06-Dec-2019 08:48	<input type="checkbox"/>
HS19120354-09	Trip Blank	Water	C&G- 080519- 1123	05-Dec-2019 00:00	06-Dec-2019 08:48	<input type="checkbox"/>

ALS Houston, US

Date: 23-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Work Order: HS19120354

CASE NARRATIVE

Work Order Comments

- The analysis for Perchlorate was subcontracted to ALS Salt Lake City, UT. Final report attached.
-

GCMS Semivolatiles by Method SW8270SIM**Batch ID: 148468**

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

GCMS Volatiles by Method SW8260**Batch ID: R352017****Sample ID: HS19120159-02MS**

- MS and MSD are for an unrelated sample

Batch ID: R352218**Sample ID: HS19120386-01MSD**

- MSD is for an unrelated sample
-

Metals by Method SW7470**Batch ID: 148663**

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

Metals by Method SW6020**Batch ID: 148640****Sample ID: HS19120386-01MS**

- MS/MSD and DUPS are for an unrelated sample
-

ALS Houston, US

Date: 23-Dec-19

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP 18 24
 Sample ID: 18CPTMW22R_120519
 Collection Date: 05-Dec-2019 07:50

ANALYTICAL REPORT
 WorkOrder:HS19120354
 Lab ID:HS19120354-01
 Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD		Method:SW8260						
8260C								Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 17:31
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 17:31
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	08-Dec-2019 17:31
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 17:31
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 17:31
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 17:31
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 17:31
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	08-Dec-2019 17:31
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	08-Dec-2019 17:31
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	08-Dec-2019 17:31
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 17:31
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 17:31
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 17:31
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	08-Dec-2019 17:31
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 17:31
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	08-Dec-2019 17:31
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 17:31
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	08-Dec-2019 17:31
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 17:31
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	08-Dec-2019 17:31
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 17:31
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	08-Dec-2019 17:31
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 17:31
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	08-Dec-2019 17:31
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	08-Dec-2019 17:31
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 17:31
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	08-Dec-2019 17:31
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	08-Dec-2019 17:31
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 17:31
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	08-Dec-2019 17:31
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 17:31
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 17:31
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	08-Dec-2019 17:31
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	08-Dec-2019 17:31
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	08-Dec-2019 17:31
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	08-Dec-2019 17:31
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 17:31
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 17:31
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 17:31

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

ALS Houston, US

Date: 23-Dec-19

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP 18 24
 Sample ID: 18CPTMW22R_120519
 Collection Date: 05-Dec-2019 07:50

ANALYTICAL REPORT
 WorkOrder:HS19120354
 Lab ID:HS19120354-01
 Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED	
VOLATILES ORGANICS BY METHOD		Method:SW8260							Analyst: PC
8260C									
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 17:31	
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 17:31	
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	08-Dec-2019 17:31	
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 17:31	
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 17:31	
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 17:31	
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 17:31	
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	UG/L	1	08-Dec-2019 17:31	
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 17:31	
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	08-Dec-2019 17:31	
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	08-Dec-2019 17:31	
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	08-Dec-2019 17:31	
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 17:31	
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 17:31	
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 17:31	
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 17:31	
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 17:31	
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 17:31	
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 17:31	
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 17:31	
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 17:31	
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 17:31	
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 17:31	
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 17:31	
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 17:31	
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>95.2</i>			0	<i>81-118</i>	<i>%REC</i>	<i>1</i>	<i>08-Dec-2019 17:31</i>	
<i>Surr: 4-Bromofluorobenzene</i>	<i>98.0</i>			0	<i>85-114</i>	<i>%REC</i>	<i>1</i>	<i>08-Dec-2019 17:31</i>	
<i>Surr: Dibromofluoromethane</i>	<i>94.7</i>			0	<i>80-119</i>	<i>%REC</i>	<i>1</i>	<i>08-Dec-2019 17:31</i>	
<i>Surr: Toluene-d8</i>	<i>100</i>			0	<i>89-112</i>	<i>%REC</i>	<i>1</i>	<i>08-Dec-2019 17:31</i>	
SEMIVOLATILES SIM		Method:SW8270SIM				Prep:SW3510 / 10-Dec-2019		Analyst: LG	
1,4-Dioxane	0.010	U	0.010	0.010	0.010	ug/L	1	16-Dec-2019 10:22	
<i>Surr: 2-Fluorobiphenyl</i>	<i>123</i>			0	<i>40-140</i>	<i>%REC</i>	<i>1</i>	<i>16-Dec-2019 10:22</i>	
<i>Surr: 4-Terphenyl-d14</i>	<i>108</i>			0	<i>40-140</i>	<i>%REC</i>	<i>1</i>	<i>16-Dec-2019 10:22</i>	
<i>Surr: Nitrobenzene-d5</i>	<i>120</i>			0	<i>40-140</i>	<i>%REC</i>	<i>1</i>	<i>16-Dec-2019 10:22</i>	

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

ALS Houston, US

Date: 23-Dec-19

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP 18 24
 Sample ID: 18CPTMW22R_120519
 Collection Date: 05-Dec-2019 07:50

ANALYTICAL REPORT
 WorkOrder:HS19120354
 Lab ID:HS19120354-01
 Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A			Method:SW6020			Prep:SW3010A / 13-Dec-2019		Analyst: JHD
Aluminum	22.4		0.0360	0.100	0.200	mg/L	20	17-Dec-2019 12:20
Antimony	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	17-Dec-2019 10:55
Arsenic	0.000937	J	0.000400	0.000500	0.00500	mg/L	1	17-Dec-2019 10:55
Barium	0.0563		0.00190	0.00250	0.00500	mg/L	1	17-Dec-2019 10:55
Beryllium	0.000311	J	0.000200	0.000500	0.00200	mg/L	1	17-Dec-2019 10:55
Cadmium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	17-Dec-2019 10:55
Calcium	0.579		0.0340	0.0500	0.500	mg/L	1	17-Dec-2019 10:55
Chromium	0.00195	J	0.000400	0.000500	0.00500	mg/L	1	17-Dec-2019 10:55
Cobalt	0.00610		0.000100	0.000500	0.00500	mg/L	1	17-Dec-2019 10:55
Copper	0.00200	J	0.00100	0.00250	0.00500	mg/L	1	17-Dec-2019 10:55
Iron	2.03		0.0120	0.0500	0.200	mg/L	1	17-Dec-2019 10:55
Lead	0.00129	J	0.000600	0.00100	0.00500	mg/L	1	17-Dec-2019 10:55
Magnesium	0.689		0.0100	0.0500	0.200	mg/L	1	17-Dec-2019 10:55
Manganese	0.0484		0.000700	0.00250	0.00500	mg/L	1	17-Dec-2019 10:55
Nickel	0.00260	J	0.000600	0.00100	0.00500	mg/L	1	17-Dec-2019 10:55
Potassium	0.265		0.0180	0.0500	0.200	mg/L	1	17-Dec-2019 10:55
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	17-Dec-2019 10:55
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	17-Dec-2019 10:55
Sodium	18.3		0.0140	0.0500	0.200	mg/L	1	17-Dec-2019 10:55
Thallium	0.000661	J	0.000200	0.000500	0.00200	mg/L	1	17-Dec-2019 10:55
Vanadium	0.00386	J	0.000600	0.00100	0.00500	mg/L	1	17-Dec-2019 10:55
Zinc	0.00834		0.00200	0.00250	0.00500	mg/L	1	17-Dec-2019 10:55
MERCURY BY SW7470A			Method:SW7470			Prep:SW7470 / 13-Dec-2019		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	13-Dec-2019 15:27
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)			Method:NA			Analyst: SUB		
Subcontract Analysis	See Attached		0	0		NA	1	23-Dec-2019 17:05

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

ALS Houston, US

Date: 23-Dec-19

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP 18 24
 Sample ID: MW20_120519
 Collection Date: 05-Dec-2019 08:35

ANALYTICAL REPORT
 WorkOrder:HS19120354
 Lab ID:HS19120354-02
 Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED	
VOLATILES ORGANICS BY METHOD		Method:SW8260							Analyst: PC
8260C									
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 17:55	
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 17:55	
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	08-Dec-2019 17:55	
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 17:55	
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 17:55	
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 17:55	
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 17:55	
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	08-Dec-2019 17:55	
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	08-Dec-2019 17:55	
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	08-Dec-2019 17:55	
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 17:55	
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 17:55	
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 17:55	
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	08-Dec-2019 17:55	
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 17:55	
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	08-Dec-2019 17:55	
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 17:55	
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	08-Dec-2019 17:55	
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 17:55	
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	08-Dec-2019 17:55	
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 17:55	
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	08-Dec-2019 17:55	
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 17:55	
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	08-Dec-2019 17:55	
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	08-Dec-2019 17:55	
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 17:55	
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	08-Dec-2019 17:55	
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	08-Dec-2019 17:55	
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 17:55	
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	08-Dec-2019 17:55	
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 17:55	
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 17:55	
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	08-Dec-2019 17:55	
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	08-Dec-2019 17:55	
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	08-Dec-2019 17:55	
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	08-Dec-2019 17:55	
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 17:55	
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 17:55	
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 17:55	

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

ALS Houston, US

Date: 23-Dec-19

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP 18 24
 Sample ID: MW20_120519
 Collection Date: 05-Dec-2019 08:35

ANALYTICAL REPORT
 WorkOrder:HS19120354
 Lab ID:HS19120354-02
 Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED	
VOLATILES ORGANICS BY METHOD 8260C		Method:SW8260						Analyst: PC	
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 17:55	
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 17:55	
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	08-Dec-2019 17:55	
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 17:55	
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 17:55	
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 17:55	
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 17:55	
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	UG/L	1	08-Dec-2019 17:55	
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 17:55	
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	08-Dec-2019 17:55	
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	08-Dec-2019 17:55	
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	08-Dec-2019 17:55	
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 17:55	
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 17:55	
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 17:55	
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 17:55	
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 17:55	
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 17:55	
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 17:55	
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 17:55	
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 17:55	
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 17:55	
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 17:55	
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 17:55	
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 17:55	
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>95.7</i>			0	<i>81-118</i>	<i>%REC</i>	<i>1</i>	<i>08-Dec-2019 17:55</i>	
<i>Surr: 4-Bromofluorobenzene</i>	<i>97.8</i>			0	<i>85-114</i>	<i>%REC</i>	<i>1</i>	<i>08-Dec-2019 17:55</i>	
<i>Surr: Dibromofluoromethane</i>	<i>93.9</i>			0	<i>80-119</i>	<i>%REC</i>	<i>1</i>	<i>08-Dec-2019 17:55</i>	
<i>Surr: Toluene-d8</i>	<i>101</i>			0	<i>89-112</i>	<i>%REC</i>	<i>1</i>	<i>08-Dec-2019 17:55</i>	
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		Method:NA						Analyst: SUB	
Subcontract Analysis	See Attached		0	0		NA	1	23-Dec-2019 17:05	

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

ALS Houston, US

Date: 23-Dec-19

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP 18 24
 Sample ID: MW20_120519_a
 Collection Date: 05-Dec-2019 08:35

ANALYTICAL REPORT
 WorkOrder:HS19120354
 Lab ID:HS19120354-03
 Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD		Method:SW8260						
8260C								Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 18:19
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 18:19
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	08-Dec-2019 18:19
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 18:19
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 18:19
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 18:19
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 18:19
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	08-Dec-2019 18:19
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	08-Dec-2019 18:19
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	08-Dec-2019 18:19
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 18:19
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 18:19
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 18:19
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	08-Dec-2019 18:19
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 18:19
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	08-Dec-2019 18:19
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 18:19
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	08-Dec-2019 18:19
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 18:19
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	08-Dec-2019 18:19
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 18:19
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	08-Dec-2019 18:19
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 18:19
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	08-Dec-2019 18:19
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	08-Dec-2019 18:19
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 18:19
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	08-Dec-2019 18:19
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	08-Dec-2019 18:19
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 18:19
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	08-Dec-2019 18:19
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 18:19
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 18:19
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	08-Dec-2019 18:19
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	08-Dec-2019 18:19
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	08-Dec-2019 18:19
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	08-Dec-2019 18:19
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 18:19
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 18:19
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 18:19

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

ALS Houston, US

Date: 23-Dec-19

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP 18 24
 Sample ID: MW20_120519_a
 Collection Date: 05-Dec-2019 08:35

ANALYTICAL REPORT
 WorkOrder:HS19120354
 Lab ID:HS19120354-03
 Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED	
VOLATILES ORGANICS BY METHOD 8260C		Method:SW8260						Analyst: PC	
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 18:19	
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 18:19	
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	08-Dec-2019 18:19	
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 18:19	
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 18:19	
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 18:19	
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 18:19	
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	UG/L	1	08-Dec-2019 18:19	
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 18:19	
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	08-Dec-2019 18:19	
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	08-Dec-2019 18:19	
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	08-Dec-2019 18:19	
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 18:19	
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 18:19	
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 18:19	
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 18:19	
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 18:19	
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 18:19	
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 18:19	
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 18:19	
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 18:19	
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 18:19	
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 18:19	
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 18:19	
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 18:19	
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>96.8</i>			0	<i>81-118</i>	<i>%REC</i>	<i>1</i>	<i>08-Dec-2019 18:19</i>	
<i>Surr: 4-Bromofluorobenzene</i>	<i>98.4</i>			0	<i>85-114</i>	<i>%REC</i>	<i>1</i>	<i>08-Dec-2019 18:19</i>	
<i>Surr: Dibromofluoromethane</i>	<i>95.9</i>			0	<i>80-119</i>	<i>%REC</i>	<i>1</i>	<i>08-Dec-2019 18:19</i>	
<i>Surr: Toluene-d8</i>	<i>101</i>			0	<i>89-112</i>	<i>%REC</i>	<i>1</i>	<i>08-Dec-2019 18:19</i>	
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		Method:NA						Analyst: SUB	
Subcontract Analysis	See Attached		0	0		NA	1	23-Dec-2019 17:05	

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

ALS Houston, US

Date: 23-Dec-19

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP 18 24
 Sample ID: 18CPTMW22SW_120519
 Collection Date: 05-Dec-2019 09:25

ANALYTICAL REPORT
 WorkOrder:HS19120354
 Lab ID:HS19120354-04
 Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD		Method:SW8260						
8260C								Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 18:43
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 18:43
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	08-Dec-2019 18:43
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 18:43
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 18:43
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 18:43
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 18:43
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	08-Dec-2019 18:43
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	08-Dec-2019 18:43
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	08-Dec-2019 18:43
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 18:43
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 18:43
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 18:43
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	08-Dec-2019 18:43
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 18:43
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	08-Dec-2019 18:43
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 18:43
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	08-Dec-2019 18:43
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 18:43
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	08-Dec-2019 18:43
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 18:43
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	08-Dec-2019 18:43
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 18:43
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	08-Dec-2019 18:43
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	08-Dec-2019 18:43
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 18:43
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	08-Dec-2019 18:43
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	08-Dec-2019 18:43
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 18:43
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	08-Dec-2019 18:43
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 18:43
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 18:43
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	08-Dec-2019 18:43
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	08-Dec-2019 18:43
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	08-Dec-2019 18:43
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	08-Dec-2019 18:43
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 18:43
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 18:43
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 18:43

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

ALS Houston, US

Date: 23-Dec-19

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP 18 24
 Sample ID: 18CPTMW22SW_120519
 Collection Date: 05-Dec-2019 09:25

ANALYTICAL REPORT
 WorkOrder:HS19120354
 Lab ID:HS19120354-04
 Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD		Method:SW8260						
8260C								Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 18:43
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 18:43
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	08-Dec-2019 18:43
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 18:43
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 18:43
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 18:43
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 18:43
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	UG/L	1	08-Dec-2019 18:43
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 18:43
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	08-Dec-2019 18:43
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	08-Dec-2019 18:43
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	08-Dec-2019 18:43
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 18:43
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 18:43
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 18:43
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 18:43
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 18:43
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 18:43
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 18:43
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 18:43
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 18:43
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 18:43
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 18:43
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 18:43
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 18:43
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>95.0</i>			0	<i>81-118</i>	%REC	1	<i>08-Dec-2019 18:43</i>
<i>Surr: 4-Bromofluorobenzene</i>	<i>99.0</i>			0	<i>85-114</i>	%REC	1	<i>08-Dec-2019 18:43</i>
<i>Surr: Dibromofluoromethane</i>	<i>94.9</i>			0	<i>80-119</i>	%REC	1	<i>08-Dec-2019 18:43</i>
<i>Surr: Toluene-d8</i>	<i>99.3</i>			0	<i>89-112</i>	%REC	1	<i>08-Dec-2019 18:43</i>
SEMIVOLATILES SIM		Method:SW8270SIM						
1,4-Dioxane	2.5		0.10	0.10	0.10	ug/L	10	16-Dec-2019 12:43
<i>Surr: 2-Fluorobiphenyl</i>	<i>106</i>			0	<i>40-140</i>	%REC	10	<i>16-Dec-2019 12:43</i>
<i>Surr: 4-Terphenyl-d14</i>	<i>109</i>			0	<i>40-140</i>	%REC	10	<i>16-Dec-2019 12:43</i>
<i>Surr: Nitrobenzene-d5</i>	<i>116</i>			0	<i>40-140</i>	%REC	10	<i>16-Dec-2019 12:43</i>

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

ALS Houston, US

Date: 23-Dec-19

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP 18 24
 Sample ID: 18CPTMW22SW_120519
 Collection Date: 05-Dec-2019 09:25

ANALYTICAL REPORT
 WorkOrder:HS19120354
 Lab ID:HS19120354-04
 Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A			Method:SW6020			Prep:SW3010A / 13-Dec-2019		Analyst: JHD
Aluminum	0.0584		0.00180	0.00500	0.0100	mg/L	1	17-Dec-2019 10:57
Antimony	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	17-Dec-2019 10:57
Arsenic	0.00197	J	0.000400	0.000500	0.00500	mg/L	1	17-Dec-2019 10:57
Barium	0.0995		0.00190	0.00250	0.00500	mg/L	1	17-Dec-2019 10:57
Beryllium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	17-Dec-2019 10:57
Cadmium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	17-Dec-2019 10:57
Calcium	13.4		0.0340	0.0500	0.500	mg/L	1	17-Dec-2019 10:57
Chromium	0.0100		0.000400	0.000500	0.00500	mg/L	1	17-Dec-2019 10:57
Cobalt	0.000500	U	0.000100	0.000500	0.00500	mg/L	1	17-Dec-2019 10:57
Copper	0.00250	U	0.00100	0.00250	0.00500	mg/L	1	17-Dec-2019 10:57
Iron	0.0392	J	0.0120	0.0500	0.200	mg/L	1	17-Dec-2019 10:57
Lead	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	17-Dec-2019 10:57
Magnesium	4.52		0.0100	0.0500	0.200	mg/L	1	17-Dec-2019 10:57
Manganese	0.0157		0.000700	0.00250	0.00500	mg/L	1	17-Dec-2019 10:57
Nickel	0.000611	J	0.000600	0.00100	0.00500	mg/L	1	17-Dec-2019 10:57
Potassium	281		0.360	1.00	4.00	mg/L	20	17-Dec-2019 12:22
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	17-Dec-2019 10:57
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	17-Dec-2019 10:57
Sodium	280		0.280	1.00	4.00	mg/L	20	17-Dec-2019 12:22
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	17-Dec-2019 10:57
Vanadium	0.000853	J	0.000600	0.00100	0.00500	mg/L	1	17-Dec-2019 10:57
Zinc	0.0139		0.00200	0.00250	0.00500	mg/L	1	17-Dec-2019 10:57
MERCURY BY SW7470A			Method:SW7470			Prep:SW7470 / 13-Dec-2019		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	13-Dec-2019 15:32
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)			Method:NA			Analyst: SUB		
Subcontract Analysis	See Attached		0	0		NA	1	23-Dec-2019 17:05

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

ALS Houston, US

Date: 23-Dec-19

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP 18 24
 Sample ID: MW8_120519
 Collection Date: 05-Dec-2019 10:30

ANALYTICAL REPORT
 WorkOrder:HS19120354
 Lab ID:HS19120354-05
 Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED	
VOLATILES ORGANICS BY METHOD		Method:SW8260							Analyst: PC
8260C									
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 19:31	
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 19:31	
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	08-Dec-2019 19:31	
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 19:31	
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 19:31	
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 19:31	
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 19:31	
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	08-Dec-2019 19:31	
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	08-Dec-2019 19:31	
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	08-Dec-2019 19:31	
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 19:31	
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 19:31	
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 19:31	
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	08-Dec-2019 19:31	
1,2-Dichloroethane	1.7		0.20	0.50	1.0	UG/L	1	08-Dec-2019 19:31	
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	08-Dec-2019 19:31	
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 19:31	
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	08-Dec-2019 19:31	
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 19:31	
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	08-Dec-2019 19:31	
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 19:31	
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	08-Dec-2019 19:31	
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 19:31	
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	08-Dec-2019 19:31	
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	08-Dec-2019 19:31	
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 19:31	
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	08-Dec-2019 19:31	
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	08-Dec-2019 19:31	
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 19:31	
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	08-Dec-2019 19:31	
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 19:31	
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 19:31	
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	08-Dec-2019 19:31	
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	08-Dec-2019 19:31	
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	08-Dec-2019 19:31	
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	08-Dec-2019 19:31	
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 19:31	
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 19:31	
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 19:31	

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

ALS Houston, US

Date: 23-Dec-19

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP 18 24
 Sample ID: MW8_120519
 Collection Date: 05-Dec-2019 10:30

ANALYTICAL REPORT
 WorkOrder:HS19120354
 Lab ID:HS19120354-05
 Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED	
VOLATILES ORGANICS BY METHOD 8260C		Method:SW8260						Analyst: PC	
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 19:31	
cis-1,2-Dichloroethene	15		0.20	0.50	1.0	UG/L	1	08-Dec-2019 19:31	
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	08-Dec-2019 19:31	
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 19:31	
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 19:31	
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 19:31	
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 19:31	
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	UG/L	1	08-Dec-2019 19:31	
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 19:31	
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	08-Dec-2019 19:31	
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	08-Dec-2019 19:31	
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	08-Dec-2019 19:31	
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 19:31	
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 19:31	
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 19:31	
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 19:31	
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 19:31	
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 19:31	
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 19:31	
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 19:31	
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 19:31	
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 19:31	
Trichloroethene	180		0.20	0.50	1.0	UG/L	1	08-Dec-2019 19:31	
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 19:31	
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 19:31	
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>96.4</i>			0	<i>81-118</i>	%REC	<i>1</i>	<i>08-Dec-2019 19:31</i>	
<i>Surr: 4-Bromofluorobenzene</i>	<i>99.7</i>			0	<i>85-114</i>	%REC	<i>1</i>	<i>08-Dec-2019 19:31</i>	
<i>Surr: Dibromofluoromethane</i>	<i>94.3</i>			0	<i>80-119</i>	%REC	<i>1</i>	<i>08-Dec-2019 19:31</i>	
<i>Surr: Toluene-d8</i>	<i>99.3</i>			0	<i>89-112</i>	%REC	<i>1</i>	<i>08-Dec-2019 19:31</i>	
SEMIVOLATILES SIM		Method:SW8270SIM				Prep:SW3510 / 10-Dec-2019		Analyst: LG	
1,4-Dioxane	2.9		0.10	0.10	0.10	ug/L	10	16-Dec-2019 13:02	
<i>Surr: 2-Fluorobiphenyl</i>	<i>92.2</i>			0	<i>40-140</i>	%REC	<i>10</i>	<i>16-Dec-2019 13:02</i>	
<i>Surr: 4-Terphenyl-d14</i>	<i>115</i>			0	<i>40-140</i>	%REC	<i>10</i>	<i>16-Dec-2019 13:02</i>	
<i>Surr: Nitrobenzene-d5</i>	<i>116</i>			0	<i>40-140</i>	%REC	<i>10</i>	<i>16-Dec-2019 13:02</i>	
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		Method:NA						Analyst: SUB	
Subcontract Analysis	See Attached		0	0		NA	1	23-Dec-2019 17:05	

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

ALS Houston, US

Date: 23-Dec-19

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP 18 24
 Sample ID: MW9_120519
 Collection Date: 05-Dec-2019 11:30

ANALYTICAL REPORT
 WorkOrder:HS19120354
 Lab ID:HS19120354-06
 Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED	
VOLATILES ORGANICS BY METHOD 8260C		Method:SW8260							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 19:55	
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 19:55	
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	08-Dec-2019 19:55	
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 19:55	
1,1-Dichloroethane	0.52	J	0.20	0.50	1.0	UG/L	1	08-Dec-2019 19:55	
1,1-Dichloroethene	1.5		0.20	0.50	1.0	UG/L	1	08-Dec-2019 19:55	
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 19:55	
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	08-Dec-2019 19:55	
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	08-Dec-2019 19:55	
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	08-Dec-2019 19:55	
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 19:55	
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 19:55	
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 19:55	
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	08-Dec-2019 19:55	
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 19:55	
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	08-Dec-2019 19:55	
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 19:55	
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	08-Dec-2019 19:55	
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 19:55	
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	08-Dec-2019 19:55	
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 19:55	
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	08-Dec-2019 19:55	
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 19:55	
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	08-Dec-2019 19:55	
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	08-Dec-2019 19:55	
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 19:55	
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	08-Dec-2019 19:55	
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	08-Dec-2019 19:55	
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 19:55	
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	08-Dec-2019 19:55	
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 19:55	
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 19:55	
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	08-Dec-2019 19:55	
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	08-Dec-2019 19:55	
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	08-Dec-2019 19:55	
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	08-Dec-2019 19:55	
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 19:55	
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 19:55	
Chloroform	0.92	J	0.20	0.50	1.0	UG/L	1	08-Dec-2019 19:55	

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

ALS Houston, US

Date: 23-Dec-19

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP 18 24
 Sample ID: MW9_120519
 Collection Date: 05-Dec-2019 11:30

ANALYTICAL REPORT
 WorkOrder:HS19120354
 Lab ID:HS19120354-06
 Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED		
VOLATILES ORGANICS BY METHOD 8260C		Method:SW8260							Analyst: PC	
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 19:55		
cis-1,2-Dichloroethene	20		0.20	0.50	1.0	UG/L	1	08-Dec-2019 19:55		
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	08-Dec-2019 19:55		
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 19:55		
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 19:55		
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 19:55		
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 19:55		
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	UG/L	1	08-Dec-2019 19:55		
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 19:55		
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	08-Dec-2019 19:55		
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	08-Dec-2019 19:55		
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	08-Dec-2019 19:55		
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 19:55		
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 19:55		
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 19:55		
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 19:55		
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 19:55		
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 19:55		
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 19:55		
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 19:55		
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 19:55		
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 19:55		
Trichloroethene	760		2.0	5.0	10	UG/L	10	10-Dec-2019 17:39		
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 19:55		
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 19:55		
Surr: 1,2-Dichloroethane-d4	96.6			0	81-118	%REC	1	08-Dec-2019 19:55		
Surr: 1,2-Dichloroethane-d4	94.0			0	81-118	%REC	10	10-Dec-2019 17:39		
Surr: 4-Bromofluorobenzene	98.3			0	85-114	%REC	1	08-Dec-2019 19:55		
Surr: 4-Bromofluorobenzene	99.4			0	85-114	%REC	10	10-Dec-2019 17:39		
Surr: Dibromofluoromethane	95.4			0	80-119	%REC	1	08-Dec-2019 19:55		
Surr: Dibromofluoromethane	94.1			0	80-119	%REC	10	10-Dec-2019 17:39		
Surr: Toluene-d8	99.8			0	89-112	%REC	1	08-Dec-2019 19:55		
Surr: Toluene-d8	101			0	89-112	%REC	10	10-Dec-2019 17:39		
SEMIVOLATILES SIM		Method:SW8270SIM							Prep:SW3510 / 10-Dec-2019	Analyst: LG
1,4-Dioxane	0.71		0.10	0.10	0.10	ug/L	10	16-Dec-2019 13:21		
Surr: 2-Fluorobiphenyl	112			0	40-140	%REC	10	16-Dec-2019 13:21		
Surr: 4-Terphenyl-d14	115			0	40-140	%REC	10	16-Dec-2019 13:21		
Surr: Nitrobenzene-d5	112			0	40-140	%REC	10	16-Dec-2019 13:21		

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

ALS Houston, US

Date: 23-Dec-19

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP 18 24
 Sample ID: MW9_120519
 Collection Date: 05-Dec-2019 11:30

ANALYTICAL REPORT
 WorkOrder:HS19120354
 Lab ID:HS19120354-06
 Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A		Method:SW6020				Prep:SW3010A / 13-Dec-2019		Analyst: JHD
Aluminum	0.0208		0.00180	0.00500	0.0100	mg/L	1	17-Dec-2019 11:00
Antimony	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	17-Dec-2019 11:00
Arsenic	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	17-Dec-2019 11:00
Barium	0.0605		0.00190	0.00250	0.00500	mg/L	1	17-Dec-2019 11:00
Beryllium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	17-Dec-2019 11:00
Cadmium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	17-Dec-2019 11:00
Calcium	5.82		0.0340	0.0500	0.500	mg/L	1	17-Dec-2019 11:00
Chromium	0.138		0.000400	0.000500	0.00500	mg/L	1	17-Dec-2019 11:00
Cobalt	0.00128	J	0.000100	0.000500	0.00500	mg/L	1	17-Dec-2019 11:00
Copper	0.00250	U	0.00100	0.00250	0.00500	mg/L	1	17-Dec-2019 11:00
Iron	0.864		0.0120	0.0500	0.200	mg/L	1	17-Dec-2019 11:00
Lead	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	17-Dec-2019 11:00
Magnesium	1.95		0.0100	0.0500	0.200	mg/L	1	17-Dec-2019 11:00
Manganese	0.0324		0.000700	0.00250	0.00500	mg/L	1	17-Dec-2019 11:00
Nickel	0.00604		0.000600	0.00100	0.00500	mg/L	1	17-Dec-2019 11:00
Potassium	0.396		0.0180	0.0500	0.200	mg/L	1	17-Dec-2019 11:00
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	17-Dec-2019 11:00
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	17-Dec-2019 11:00
Sodium	13.2		0.0140	0.0500	0.200	mg/L	1	17-Dec-2019 11:00
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	17-Dec-2019 11:00
Vanadium	0.000987	J	0.000600	0.00100	0.00500	mg/L	1	17-Dec-2019 11:00
Zinc	0.00680		0.00200	0.00250	0.00500	mg/L	1	17-Dec-2019 11:00
MERCURY BY SW7470A		Method:SW7470				Prep:SW7470 / 13-Dec-2019		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	13-Dec-2019 15:33
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		Method:NA						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	23-Dec-2019 17:05

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

ALS Houston, US

Date: 23-Dec-19

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP 18 24
 Sample ID: MW10_120519
 Collection Date: 05-Dec-2019 12:15

ANALYTICAL REPORT
 WorkOrder:HS19120354
 Lab ID:HS19120354-07
 Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED	
VOLATILES ORGANICS BY METHOD		Method:SW8260							Analyst: PC
8260C									
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 19:07	
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 19:07	
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	08-Dec-2019 19:07	
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 19:07	
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 19:07	
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 19:07	
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 19:07	
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	08-Dec-2019 19:07	
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	08-Dec-2019 19:07	
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	08-Dec-2019 19:07	
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 19:07	
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 19:07	
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 19:07	
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	08-Dec-2019 19:07	
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 19:07	
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	08-Dec-2019 19:07	
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 19:07	
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	08-Dec-2019 19:07	
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 19:07	
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	08-Dec-2019 19:07	
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 19:07	
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	08-Dec-2019 19:07	
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 19:07	
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	08-Dec-2019 19:07	
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	08-Dec-2019 19:07	
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 19:07	
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	08-Dec-2019 19:07	
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	08-Dec-2019 19:07	
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 19:07	
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	08-Dec-2019 19:07	
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 19:07	
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 19:07	
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	08-Dec-2019 19:07	
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	08-Dec-2019 19:07	
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	08-Dec-2019 19:07	
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	08-Dec-2019 19:07	
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 19:07	
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 19:07	
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 19:07	

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

ALS Houston, US

Date: 23-Dec-19

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP 18 24
 Sample ID: MW10_120519
 Collection Date: 05-Dec-2019 12:15

ANALYTICAL REPORT
 WorkOrder:HS19120354
 Lab ID:HS19120354-07
 Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED	
VOLATILES ORGANICS BY METHOD 8260C		Method:SW8260						Analyst: PC	
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 19:07	
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 19:07	
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	08-Dec-2019 19:07	
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 19:07	
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 19:07	
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 19:07	
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 19:07	
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	UG/L	1	08-Dec-2019 19:07	
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 19:07	
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	08-Dec-2019 19:07	
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	08-Dec-2019 19:07	
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	08-Dec-2019 19:07	
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 19:07	
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 19:07	
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 19:07	
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 19:07	
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 19:07	
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 19:07	
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 19:07	
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 19:07	
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 19:07	
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 19:07	
Trichloroethene	1.3		0.20	0.50	1.0	UG/L	1	08-Dec-2019 19:07	
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 19:07	
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 19:07	
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>95.9</i>			0	<i>81-118</i>	%REC	1	08-Dec-2019 19:07	
<i>Surr: 4-Bromofluorobenzene</i>	<i>98.9</i>			0	<i>85-114</i>	%REC	1	08-Dec-2019 19:07	
<i>Surr: Dibromofluoromethane</i>	<i>95.3</i>			0	<i>80-119</i>	%REC	1	08-Dec-2019 19:07	
<i>Surr: Toluene-d8</i>	<i>101</i>			0	<i>89-112</i>	%REC	1	08-Dec-2019 19:07	
SEMIVOLATILES SIM		Method:SW8270SIM				Prep:SW3510 / 10-Dec-2019		Analyst: LG	
1,4-Dioxane	0.13		0.010	0.010	0.010	ug/L	1	16-Dec-2019 11:40	
<i>Surr: 2-Fluorobiphenyl</i>	<i>88.8</i>			0	<i>40-140</i>	%REC	1	16-Dec-2019 11:40	
<i>Surr: 4-Terphenyl-d14</i>	<i>112</i>			0	<i>40-140</i>	%REC	1	16-Dec-2019 11:40	
<i>Surr: Nitrobenzene-d5</i>	<i>96.5</i>			0	<i>40-140</i>	%REC	1	16-Dec-2019 11:40	
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		Method:NA						Analyst: SUB	
Subcontract Analysis	See Attached		0	0		NA	1	23-Dec-2019 17:05	

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

ALS Houston, US

Date: 23-Dec-19

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP 18 24
 Sample ID: MW17_120519
 Collection Date: 05-Dec-2019 13:05

ANALYTICAL REPORT

WorkOrder:HS19120354
 Lab ID:HS19120354-08
 Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
SEMIVOLATILES SIM	Method:SW8270SIM					Prep:SW3510 / 10-Dec-2019		Analyst: LG
1,4-Dioxane	0.37		0.010	0.010	0.010	ug/L	1	16-Dec-2019 11:59
<i>Surr: 2-Fluorobiphenyl</i>	112			0	40-140	%REC	1	16-Dec-2019 11:59
<i>Surr: 4-Terphenyl-d14</i>	93.0			0	40-140	%REC	1	16-Dec-2019 11:59
<i>Surr: Nitrobenzene-d5</i>	111			0	40-140	%REC	1	16-Dec-2019 11:59
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)	Method:NA							Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	23-Dec-2019 17:05

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

ALS Houston, US

Date: 23-Dec-19

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP 18 24
 Sample ID: Trip Blank
 Collection Date: 05-Dec-2019 00:00

ANALYTICAL REPORT
 WorkOrder:HS19120354
 Lab ID:HS19120354-09
 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD		Method:SW8260						
8260C								Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 17:07
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 17:07
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	08-Dec-2019 17:07
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 17:07
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 17:07
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 17:07
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 17:07
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	08-Dec-2019 17:07
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	08-Dec-2019 17:07
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	08-Dec-2019 17:07
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 17:07
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 17:07
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 17:07
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	08-Dec-2019 17:07
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 17:07
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	08-Dec-2019 17:07
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 17:07
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	08-Dec-2019 17:07
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 17:07
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	08-Dec-2019 17:07
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 17:07
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	08-Dec-2019 17:07
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 17:07
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	08-Dec-2019 17:07
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	08-Dec-2019 17:07
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 17:07
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	08-Dec-2019 17:07
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	08-Dec-2019 17:07
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 17:07
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	08-Dec-2019 17:07
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 17:07
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 17:07
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	08-Dec-2019 17:07
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	08-Dec-2019 17:07
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	08-Dec-2019 17:07
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	08-Dec-2019 17:07
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 17:07
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 17:07
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 17:07

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

ALS Houston, US

Date: 23-Dec-19

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP 18 24
 Sample ID: Trip Blank
 Collection Date: 05-Dec-2019 00:00

ANALYTICAL REPORT
 WorkOrder:HS19120354
 Lab ID:HS19120354-09
 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD		Method:SW8260						
8260C								Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 17:07
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 17:07
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	08-Dec-2019 17:07
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 17:07
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 17:07
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 17:07
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 17:07
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	UG/L	1	08-Dec-2019 17:07
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 17:07
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	08-Dec-2019 17:07
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	08-Dec-2019 17:07
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	08-Dec-2019 17:07
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 17:07
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 17:07
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 17:07
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 17:07
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 17:07
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 17:07
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 17:07
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 17:07
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 17:07
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 17:07
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 17:07
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	08-Dec-2019 17:07
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	08-Dec-2019 17:07
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>94.9</i>			0	<i>81-118</i>	<i>%REC</i>	<i>1</i>	<i>08-Dec-2019 17:07</i>
<i>Surr: 4-Bromofluorobenzene</i>	<i>99.2</i>			0	<i>85-114</i>	<i>%REC</i>	<i>1</i>	<i>08-Dec-2019 17:07</i>
<i>Surr: Dibromofluoromethane</i>	<i>95.0</i>			0	<i>80-119</i>	<i>%REC</i>	<i>1</i>	<i>08-Dec-2019 17:07</i>
<i>Surr: Toluene-d8</i>	<i>101</i>			0	<i>89-112</i>	<i>%REC</i>	<i>1</i>	<i>08-Dec-2019 17:07</i>

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

Weight / Prep Log

Client: Bhate Environmental Associates, Inc.

Project: LHAAP 18 24

WorkOrder: HS19120354

Batch ID: 148468	Start Date: 10 Dec 2019 09:12	End Date: 10 Dec 2019 14:30
Method: SV AQ SEP FUN EXTRACT-LOWLEV - 3510C	Prep Code: 3510_B_SIM	

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19120354-01	1	1000 (mL)	1 (mL)	0.001
HS19120354-04	1	1000 (mL)	1 (mL)	0.001
HS19120354-05	1	1000 (mL)	1 (mL)	0.001
HS19120354-06	1	1000 (mL)	1 (mL)	0.001
HS19120354-07	1	1000 (mL)	1 (mL)	0.001
HS19120354-08	1	1000 (mL)	1 (mL)	0.001

Batch ID: 148640	Start Date: 13 Dec 2019 11:30	End Date: 13 Dec 2019 15:30
Method: WATER - SW3010A	Prep Code: 3010A	

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19120354-01		10 (mL)	10 (mL)	1
HS19120354-04		10 (mL)	10 (mL)	1
HS19120354-06		10 (mL)	10 (mL)	1

Batch ID: 148663	Start Date: 13 Dec 2019 10:30	End Date: 13 Dec 2019 12:30
Method: MERCURY PREP BY 7470A- WATER	Prep Code: HG_WPR	

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19120354-01		10 (mL)	10 (mL)	1
HS19120354-04		10 (mL)	10 (mL)	1
HS19120354-06		10 (mL)	10 (mL)	1

ALS Houston, US

Date: 23-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19120354

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: 148468 (0)		Test Name : SEMIVOLATILES SIM			Matrix: GW	
HS19120354-01	18CPTMW22R_120519	05 Dec 2019 07:50		10 Dec 2019 09:12	16 Dec 2019 10:22	1
HS19120354-04	18CPTMW22SW_120519	05 Dec 2019 09:25		10 Dec 2019 09:12	16 Dec 2019 12:43	10
HS19120354-05	MW8_120519	05 Dec 2019 10:30		10 Dec 2019 09:12	16 Dec 2019 13:02	10
HS19120354-06	MW9_120519	05 Dec 2019 11:30		10 Dec 2019 09:12	16 Dec 2019 13:21	10
HS19120354-07	MW10_120519	05 Dec 2019 12:15		10 Dec 2019 09:12	16 Dec 2019 11:40	1
HS19120354-08	MW17_120519	05 Dec 2019 13:05		10 Dec 2019 09:12	16 Dec 2019 11:59	1
Batch ID: 148640 (0)		Test Name : METALS BY ICPMS BY SW6020A			Matrix: GW	
HS19120354-01	18CPTMW22R_120519	05 Dec 2019 07:50		13 Dec 2019 14:30	17 Dec 2019 12:20	20
HS19120354-01	18CPTMW22R_120519	05 Dec 2019 07:50		13 Dec 2019 14:30	17 Dec 2019 10:55	1
HS19120354-04	18CPTMW22SW_120519	05 Dec 2019 09:25		13 Dec 2019 14:30	17 Dec 2019 12:22	20
HS19120354-04	18CPTMW22SW_120519	05 Dec 2019 09:25		13 Dec 2019 14:30	17 Dec 2019 10:57	1
HS19120354-06	MW9_120519	05 Dec 2019 11:30		13 Dec 2019 14:30	17 Dec 2019 11:00	1
Batch ID: 148663 (0)		Test Name : MERCURY BY SW7470A			Matrix: GW	
HS19120354-01	18CPTMW22R_120519	05 Dec 2019 07:50		13 Dec 2019 10:30	13 Dec 2019 15:27	1
HS19120354-04	18CPTMW22SW_120519	05 Dec 2019 09:25		13 Dec 2019 10:30	13 Dec 2019 15:32	1
HS19120354-06	MW9_120519	05 Dec 2019 11:30		13 Dec 2019 10:30	13 Dec 2019 15:33	1
Batch ID: R352017 (0)		Test Name : VOLATILES ORGANICS BY METHOD 8260C			Matrix: Water	
HS19120354-09	Trip Blank	05 Dec 2019 00:00			08 Dec 2019 17:07	1
Batch ID: R352017 (0)		Test Name : VOLATILES ORGANICS BY METHOD 8260C			Matrix: GW	
HS19120354-01	18CPTMW22R_120519	05 Dec 2019 07:50			08 Dec 2019 17:31	1
HS19120354-02	MW20_120519	05 Dec 2019 08:35			08 Dec 2019 17:55	1
HS19120354-03	MW20_120519_a	05 Dec 2019 08:35			08 Dec 2019 18:19	1
HS19120354-04	18CPTMW22SW_120519	05 Dec 2019 09:25			08 Dec 2019 18:43	1
HS19120354-05	MW8_120519	05 Dec 2019 10:30			08 Dec 2019 19:31	1
HS19120354-06	MW9_120519	05 Dec 2019 11:30			08 Dec 2019 19:55	1
HS19120354-07	MW10_120519	05 Dec 2019 12:15			08 Dec 2019 19:07	1
Batch ID: R352218 (0)		Test Name : VOLATILES ORGANICS BY METHOD 8260C			Matrix: GW	
HS19120354-06	MW9_120519	05 Dec 2019 11:30			10 Dec 2019 17:39	10
Batch ID: R353152 (0)		Test Name : SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)			Matrix: GW	
HS19120354-01	18CPTMW22R_120519	05 Dec 2019 07:50			23 Dec 2019 17:05	1
HS19120354-02	MW20_120519	05 Dec 2019 08:35			23 Dec 2019 17:05	1
HS19120354-03	MW20_120519_a	05 Dec 2019 08:35			23 Dec 2019 17:05	1
HS19120354-04	18CPTMW22SW_120519	05 Dec 2019 09:25			23 Dec 2019 17:05	1
HS19120354-05	MW8_120519	05 Dec 2019 10:30			23 Dec 2019 17:05	1
HS19120354-06	MW9_120519	05 Dec 2019 11:30			23 Dec 2019 17:05	1
HS19120354-07	MW10_120519	05 Dec 2019 12:15			23 Dec 2019 17:05	1
HS19120354-08	MW17_120519	05 Dec 2019 13:05			23 Dec 2019 17:05	1

ALS Houston, US

Date: 23-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19120354

QC BATCH REPORT

Batch ID: 148640 (0)		Instrument: ICPMS05		Method: METALS BY ICPMS BY SW6020A						
MBLK	Sample ID: MBLK-148640	Units: mg/L			Analysis Date: 17-Dec-2019 10:51					
Client ID:	Run ID: ICPMS05_352677	SeqNo: 5394917	PrepDate: 13-Dec-2019	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.006538	0.0100								J
Antimony	0.000500	0.00500								U
Arsenic	0.000500	0.00500								U
Barium	0.00250	0.00500								U
Beryllium	0.000500	0.00200								U
Cadmium	0.000500	0.00200								U
Calcium	0.0500	0.500								U
Chromium	0.000500	0.00500								U
Cobalt	0.000500	0.00500								U
Copper	0.00250	0.00500								U
Iron	0.0500	0.200								U
Lead	0.00100	0.00500								U
Magnesium	0.0500	0.200								U
Manganese	0.00250	0.00500								U
Nickel	0.00100	0.00500								U
Potassium	0.0500	0.200								U
Selenium	0.00250	0.00500								U
Silver	0.000500	0.00500								U
Sodium	0.0500	0.200								U
Thallium	0.000500	0.00200								U
Vanadium	0.00100	0.00500								U
Zinc	0.00250	0.00500								U

ALS Houston, US

Date: 23-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19120354

QC BATCH REPORT

Batch ID: 148640 (0)		Instrument: ICPMS05		Method: METALS BY ICPMS BY SW6020A						
LCS	Sample ID: LCS-148640	Units: mg/L			Analysis Date: 17-Dec-2019 10:53					
Client ID:	Run ID: ICPMS05_352677	SeqNo: 5394918	PrepDate: 13-Dec-2019	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.0907	0.0100	0.1	0	90.7	84 - 117				
Antimony	0.04987	0.00500	0.05	0	99.7	85 - 117				
Arsenic	0.04935	0.00500	0.05	0	98.7	84 - 116				
Barium	0.04729	0.00500	0.05	0	94.6	86 - 114				
Beryllium	0.04943	0.00200	0.05	0	98.9	83 - 121				
Cadmium	0.04972	0.00200	0.05	0	99.4	87 - 115				
Calcium	5.076	0.500	5	0	102	87 - 118				
Chromium	0.0485	0.00500	0.05	0	97.0	85 - 116				
Cobalt	0.04964	0.00500	0.05	0	99.3	86 - 115				
Copper	0.04961	0.00500	0.05	0	99.2	85 - 118				
Iron	5.135	0.200	5	0	103	87 - 118				
Lead	0.04709	0.00500	0.05	0	94.2	88 - 115				
Magnesium	5.044	0.200	5	0	101	83 - 118				
Manganese	0.05016	0.00500	0.05	0	100	87 - 115				
Nickel	0.05126	0.00500	0.05	0	103	85 - 117				
Potassium	5.086	0.200	5	0	102	87 - 115				
Selenium	0.05047	0.00500	0.05	0	101	80 - 120				
Silver	0.04548	0.00500	0.05	0	91.0	85 - 116				
Sodium	5.056	0.200	5	0	101	85 - 117				
Thallium	0.0444	0.00200	0.05	0	88.8	82 - 116				
Vanadium	0.04849	0.00500	0.05	0	97.0	86 - 115				
Zinc	0.05151	0.00500	0.05	0	103	83 - 119				

ALS Houston, US

Date: 23-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19120354

QC BATCH REPORT

Batch ID: 148640 (0)		Instrument: ICPMS05		Method: METALS BY ICPMS BY SW6020A						
MS	Sample ID: HS19120386-01MS	Units: mg/L			Analysis Date: 17-Dec-2019 11:20					
Client ID:	Run ID: ICPMS05_352677	SeqNo: 5394930	PrepDate: 13-Dec-2019	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.1153	0.0100	0.1	0.0378	77.5	84 - 117				S
Antimony	0.05003	0.00500	0.05	0.000146	99.8	85 - 117				
Arsenic	0.05042	0.00500	0.05	0.000792	99.3	84 - 116				
Barium	0.8194	0.00500	0.05	0.8153	8.21	86 - 114				SO
Beryllium	0.05303	0.00200	0.05	0.000006	106	83 - 121				
Cadmium	0.04769	0.00200	0.05	0.000159	95.1	87 - 115				
Calcium	67.27	0.500	5	63.27	80.0	87 - 118				SO
Chromium	0.05613	0.00500	0.05	0.007248	97.8	85 - 116				
Cobalt	0.05016	0.00500	0.05	0.002323	95.7	86 - 115				
Copper	0.04887	0.00500	0.05	0.00014	97.5	85 - 118				
Iron	5.731	0.200	5	0.776	99.1	87 - 118				
Lead	0.04884	0.00500	0.05	0.000053	97.6	88 - 115				
Magnesium	37.85	0.200	5	33.67	83.7	83 - 118				O
Manganese	0.4258	0.00500	0.05	0.3904	70.9	87 - 115				SO
Nickel	0.05467	0.00500	0.05	0.006239	96.9	85 - 117				
Potassium	44.94	0.200	5	41.28	73.2	87 - 115				SO
Selenium	0.05103	0.00500	0.05	0.000157	102	80 - 120				
Silver	0.04376	0.00500	0.05	0.000016	87.5	85 - 116				
Sodium	223.9	0.200	5	226.7	-55.8	85 - 117				SEO
Thallium	0.04494	0.00200	0.05	0.000097	89.7	82 - 116				
Vanadium	0.0499	0.00500	0.05	0.00057	98.7	86 - 115				
Zinc	0.06194	0.00500	0.05	0.01223	99.4	83 - 119				

ALS Houston, US

Date: 23-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19120354

QC BATCH REPORT

Batch ID: 148640 (0)		Instrument: ICPMS05		Method: METALS BY ICPMS BY SW6020A						
MSD		Sample ID: HS19120386-01MSD		Units: mg/L		Analysis Date: 17-Dec-2019 11:22				
Client ID:		Run ID: ICPMS05_352677		SeqNo: 5394931		PrepDate: 13-Dec-2019		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.1041	0.0100	0.1	0.0378	66.3	84 - 117	0.1153	10.2	20	S
Antimony	0.04945	0.00500	0.05	0.000146	98.6	85 - 117	0.05003	1.18	20	
Arsenic	0.04915	0.00500	0.05	0.000792	96.7	84 - 116	0.05042	2.55	20	
Barium	0.8149	0.00500	0.05	0.8153	-0.786	86 - 114	0.8194	0.551	20	SO
Beryllium	0.05256	0.00200	0.05	0.000006	105	83 - 121	0.05303	0.89	20	
Cadmium	0.04763	0.00200	0.05	0.000159	94.9	87 - 115	0.04769	0.141	20	
Calcium	65.16	0.500	5	63.27	37.9	87 - 118	67.27	3.18	20	SO
Chromium	0.05411	0.00500	0.05	0.007248	93.7	85 - 116	0.05613	3.65	20	
Cobalt	0.04766	0.00500	0.05	0.002323	90.7	86 - 115	0.05016	5.13	20	
Copper	0.0468	0.00500	0.05	0.00014	93.3	85 - 118	0.04887	4.32	20	
Iron	5.493	0.200	5	0.776	94.3	87 - 118	5.731	4.25	20	
Lead	0.04838	0.00500	0.05	0.000053	96.7	88 - 115	0.04884	0.944	20	
Magnesium	37.06	0.200	5	33.67	67.9	83 - 118	37.85	2.11	20	SO
Manganese	0.4257	0.00500	0.05	0.3904	70.6	87 - 115	0.4258	0.0324	20	SO
Nickel	0.0518	0.00500	0.05	0.006239	91.1	85 - 117	0.05467	5.39	20	
Potassium	43.42	0.200	5	41.28	42.7	87 - 115	44.94	3.45	20	SO
Selenium	0.0485	0.00500	0.05	0.000157	96.7	80 - 120	0.05103	5.08	20	
Silver	0.04285	0.00500	0.05	0.000016	85.7	85 - 116	0.04376	2.12	20	
Sodium	219.4	0.200	5	226.7	-145	85 - 117	223.9	2.01	20	SEO
Thallium	0.04507	0.00200	0.05	0.000097	89.9	82 - 116	0.04494	0.276	20	
Vanadium	0.04897	0.00500	0.05	0.00057	96.8	86 - 115	0.0499	1.87	20	
Zinc	0.05908	0.00500	0.05	0.01223	93.7	83 - 119	0.06194	4.73	20	
PDS		Sample ID: HS19120386-01PDS		Units: mg/L		Analysis Date: 18-Dec-2019 15:37				
Client ID:		Run ID: ICPMS05_352780		SeqNo: 5402979		PrepDate: 13-Dec-2019		DF: 2		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.2096	0.0200	0.2	0.01455	97.5	80 - 120				

ALS Houston, US

Date: 23-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19120354

QC BATCH REPORT

Batch ID: 148640 (0)		Instrument: ICPMS05			Method: METALS BY ICPMS BY SW6020A					
PDS		Sample ID: HS19120386-01PDS			Units: mg/L		Analysis Date: 17-Dec-2019 11:25			
Client ID:		Run ID: ICPMS05_352677			SeqNo: 5394932		PrepDate: 13-Dec-2019		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.08761	0.00500	0.1	0.000146	87.5	80 - 120				
Arsenic	0.08842	0.00500	0.1	0.000792	87.6	80 - 120				
Barium	0.8064	0.00500	0.1	0.8153	-8.94	80 - 120				SO
Beryllium	0.08793	0.00200	0.1	0.000006	87.9	80 - 120				
Cadmium	0.08769	0.00200	0.1	0.000159	87.5	80 - 120				
Calcium	62.35	0.500	10	63.27	-9.25	80 - 120				SO
Chromium	0.09194	0.00500	0.1	0.007248	84.7	80 - 120				
Cobalt	0.08431	0.00500	0.1	0.002323	82.0	80 - 120				
Copper	0.08561	0.00500	0.1	0.00014	85.5	80 - 120				
Iron	9.378	0.200	10	0.776	86.0	80 - 120				
Lead	0.08719	0.00500	0.1	0.000053	87.1	80 - 120				
Nickel	0.08831	0.00500	0.1	0.006239	82.1	80 - 120				
Potassium	44.25	0.200	10	41.28	29.7	80 - 120				SO
Selenium	0.09064	0.00500	0.1	0.000157	90.5	80 - 120				
Thallium	0.08435	0.00200	0.1	0.000097	84.3	80 - 120				
Vanadium	0.08755	0.00500	0.1	0.00057	87.0	80 - 120				
Zinc	0.1014	0.00500	0.1	0.01223	89.2	80 - 120				
PDS		Sample ID: HS19120386-01PDS			Units: mg/L		Analysis Date: 17-Dec-2019 12:31			
Client ID:		Run ID: ICPMS05_352677			SeqNo: 5395314		PrepDate: 13-Dec-2019		DF: 10	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Magnesium	123.2	2.00	100	35.18	88.0	80 - 120				
Manganese	1.257	0.0500	1	0.379	87.9	80 - 120				
Sodium	301	2.00	100	232.2	68.9	80 - 120				S
SD		Sample ID: HS19120386-01SD			Units: mg/L		Analysis Date: 18-Dec-2019 15:35			
Client ID:		Run ID: ICPMS05_352780			SeqNo: 5402978		PrepDate: 13-Dec-2019		DF: 10	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	RPD Limit	Qual
Aluminum	0.02229	0.100					0.01455	0	10	J

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Date: 23-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19120354

QC BATCH REPORT

Batch ID: 148640 (0)		Instrument: ICPMS05		Method: METALS BY ICPMS BY SW6020A						
SD	Sample ID: HS19120386-01SD	Units: mg/L			Analysis Date: 17-Dec-2019 11:18					
Client ID:	Run ID: ICPMS05_352677	SeqNo: 5394929		PrepDate: 13-Dec-2019		DF: 5				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit Qual	
Antimony	0.00250	0.0250					0.000146	0 10	U	
Arsenic	0.00250	0.0250					0.000792	0 10	U	
Barium	0.7833	0.0250					0.8153	3.93 10		
Beryllium	0.00250	0.0100					0.000006	0 10	U	
Cadmium	0.00250	0.0100					0.000159	0 10	U	
Calcium	62.77	2.50					63.27	0.791 10		
Chromium	0.008182	0.0250					0.007248	0 10	J	
Cobalt	0.002434	0.0250					0.002323	0 10	J	
Copper	0.0125	0.0250					0.00014	0 10	U	
Iron	0.7668	1.00					0.776	0 10	J	
Lead	0.00500	0.0250					0.000053	0 10	U	
Nickel	0.006499	0.0250					0.006239	0 10	J	
Potassium	43.81	1.00					41.28	6.14 10		
Selenium	0.0125	0.0250					0.000157	0 10	U	
Silver	0.00250	0.0250					0.000016	0 10	U	
Thallium	0.00250	0.0100					0.000097	0 10	U	
Vanadium	0.003811	0.0250					0.00057	0 10	J	
Zinc	0.01171	0.0250					0.01223	0 10	J	
SD	Sample ID: HS19120386-01SD	Units: mg/L			Analysis Date: 17-Dec-2019 12:28					
Client ID:	Run ID: ICPMS05_352677	SeqNo: 5395313		PrepDate: 13-Dec-2019		DF: 50				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit Qual	
Magnesium	34.34	10.0					35.18	2.39 10		
Manganese	0.395	0.250					0.379	4.23 10		
Sodium	234	10.0					232.2	0.796 10		
The following samples were analyzed in this batch: HS19120354-01 HS19120354-04 HS19120354-06										

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Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19120354

QC BATCH REPORT

Batch ID: 148663 (0)		Instrument: HG03		Method: MERCURY BY SW7470A						
MBLK	Sample ID: MBLK-148663	Units: mg/L		Analysis Date: 13-Dec-2019 15:11						
Client ID:	Run ID: HG03_352483	SeqNo: 5389505		PrepDate: 13-Dec-2019		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual	
Mercury	0.000100	0.000200							U	
LCS	Sample ID: LCS-148663	Units: mg/L		Analysis Date: 13-Dec-2019 15:13						
Client ID:	Run ID: HG03_352483	SeqNo: 5389506		PrepDate: 13-Dec-2019		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual	
Mercury	0.00530	0.000200	0.005	0	106	80 - 120				
MS	Sample ID: HS19120553-03MS	Units: mg/L		Analysis Date: 13-Dec-2019 15:16						
Client ID:	Run ID: HG03_352483	SeqNo: 5389508		PrepDate: 13-Dec-2019		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual	
Mercury	0.00510	0.000200	0.005	-0.00001900	102	75 - 125				
MSD	Sample ID: HS19120553-03MSD	Units: mg/L		Analysis Date: 13-Dec-2019 15:18						
Client ID:	Run ID: HG03_352483	SeqNo: 5389509		PrepDate: 13-Dec-2019		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual	
Mercury	0.00513	0.000200	0.005	-0.00001900	103	75 - 125	0.005100	0.587	20	
The following samples were analyzed in this batch:										
HS19120354-01 HS19120354-04 HS19120354-06										

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Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19120354

QC BATCH REPORT

Batch ID: 148468 (0)		Instrument: SV-6		Method: SEMIVOLATILES SIM						
MBLK	Sample ID: MBLK-148468	Units: ug/L			Analysis Date: 16-Dec-2019 08:09					
Client ID:	Run ID: SV-6_352609	SeqNo: 5392506		PrepDate: 10-Dec-2019		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
1,4-Dioxane	0.010	0.010							U	
Surr: 2-Fluorobiphenyl	0.08708	0	0.08	0	109	40 - 140				
Surr: 4-Terphenyl-d14	0.07634	0	0.08	0	95.4	40 - 140				
Surr: Nitrobenzene-d5	0.08289	0	0.08	0	104	40 - 140				
LCS	Sample ID: LCS-148468	Units: ug/L			Analysis Date: 16-Dec-2019 08:28					
Client ID:	Run ID: SV-6_352609	SeqNo: 5392507		PrepDate: 10-Dec-2019		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
1,4-Dioxane	0.0945	0.010	0.08	0	118	40 - 140				
Surr: 2-Fluorobiphenyl	0.07699	0	0.08	0	96.2	40 - 140				
Surr: 4-Terphenyl-d14	0.07619	0	0.08	0	95.2	40 - 140				
Surr: Nitrobenzene-d5	0.08986	0	0.08	0	112	40 - 140				
LCSD	Sample ID: LCSD-148468	Units: ug/L			Analysis Date: 16-Dec-2019 08:47					
Client ID:	Run ID: SV-6_352609	SeqNo: 5392508		PrepDate: 10-Dec-2019		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
1,4-Dioxane	0.08716	0.010	0.08	0	109	40 - 140	0.0945	8.08	20	
Surr: 2-Fluorobiphenyl	0.08114	0	0.08	0	101	40 - 140	0.07699	5.25	20	
Surr: 4-Terphenyl-d14	0.06642	0	0.08	0	83.0	40 - 140	0.07619	13.7	20	
Surr: Nitrobenzene-d5	0.09291	0	0.08	0	116	40 - 140	0.08986	3.34	20	
The following samples were analyzed in this batch:				HS19120354-01	HS19120354-04	HS19120354-05	HS19120354-06			
				HS19120354-07	HS19120354-08					

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Date: 23-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19120354

QC BATCH REPORT

Batch ID: R352017 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MBLK	Sample ID: VBLKW-191208	Units: UG/L			Analysis Date: 08-Dec-2019 14:42					
Client ID:	Run ID: VOA6_352017	SeqNo: 5378920	PrepDate:	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	0.50	1.0								U
1,1,1-Trichloroethane	0.50	1.0								U
1,1,2,2-Tetrachloroethane	0.50	1.0								U
1,1,2-Trichloroethane	0.50	1.0								U
1,1-Dichloroethane	0.50	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,1-Dichloropropene	0.50	1.0								U
1,2,3-Trichlorobenzene	0.50	1.0								U
1,2,3-Trichloropropane	0.50	1.0								U
1,2,4-Trichlorobenzene	0.50	1.0								U
1,2,4-Trimethylbenzene	0.50	1.0								U
1,2-Dibromo-3-chloropropane	0.50	1.0								U
1,2-Dibromoethane	0.50	1.0								U
1,2-Dichlorobenzene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
1,2-Dichloropropane	0.50	1.0								U
1,3,5-Trimethylbenzene	0.50	1.0								U
1,3-Dichlorobenzene	0.50	1.0								U
1,3-Dichloropropane	0.50	1.0								U
1,4-Dichlorobenzene	0.50	1.0								U
2,2-Dichloropropane	0.50	1.0								U
2-Butanone	1.0	2.0								U
2-Chlorotoluene	0.50	1.0								U
2-Hexanone	1.0	2.0								U
4-Chlorotoluene	0.50	1.0								U
4-Isopropyltoluene	0.50	1.0								U
4-Methyl-2-pentanone	1.0	2.0								U
Acetone	1.0	2.0								U
Benzene	0.50	1.0								U
Bromobenzene	0.50	1.0								U
Bromochloromethane	0.50	1.0								U
Bromodichloromethane	0.50	1.0								U
Bromoform	0.50	1.0								U
Bromomethane	0.50	1.0								U

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Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19120354

QC BATCH REPORT

Batch ID: R352017 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MBLK	Sample ID: VBLKW-191208	Units: UG/L			Analysis Date: 08-Dec-2019 14:42					
Client ID:	Run ID: VOA6_352017	SeqNo: 5378920		PrepDate:		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	1.0	2.0								U
Carbon tetrachloride	0.50	1.0								U
Chlorobenzene	0.50	1.0								U
Chloroethane	0.50	1.0								U
Chloroform	0.50	1.0								U
Chloromethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
cis-1,3-Dichloropropene	0.50	1.0								U
Dibromochloromethane	0.50	1.0								U
Dibromomethane	0.50	1.0								U
Dichlorodifluoromethane	0.50	1.0								U
Ethylbenzene	0.50	1.0								U
Hexachlorobutadiene	0.50	1.0								U
Isopropylbenzene	0.50	1.0								U
m,p-Xylene	1.0	2.0								U
Methylene chloride	1.0	2.0								U
Naphthalene	0.50	1.0								U
n-Butylbenzene	0.50	1.0								U
n-Propylbenzene	0.50	1.0								U
o-Xylene	0.50	1.0								U
sec-Butylbenzene	0.50	1.0								U
Styrene	0.50	1.0								U
tert-Butylbenzene	0.50	1.0								U
Tetrachloroethene	0.50	1.0								U
Toluene	0.50	1.0								U
trans-1,2-Dichloroethene	0.50	1.0								U
trans-1,3-Dichloropropene	0.50	1.0								U
Trichloroethene	0.50	1.0								U
Trichlorofluoromethane	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	46.93	1.0	50	0	93.9	81 - 118				
Surr: 4-Bromofluorobenzene	48.91	1.0	50	0	97.8	85 - 114				
Surr: Dibromofluoromethane	46.94	1.0	50	0	93.9	80 - 119				
Surr: Toluene-d8	50.16	1.0	50	0	100	89 - 112				

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Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19120354

QC BATCH REPORT

Batch ID: R352017 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
LCS	Sample ID: VLCSW-191208	Units: UG/L			Analysis Date: 08-Dec-2019 13:54					
Client ID:	Run ID: VOA6_352017	SeqNo: 5378919		PrepDate:		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	20.08	1.0	20	0	100	78 - 124				
1,1,1-Trichloroethane	19.71	1.0	20	0	98.6	74 - 131				
1,1,2,2-Tetrachloroethane	21.42	1.0	20	0	107	71 - 121				
1,1,2-Trichloroethane	21.11	1.0	20	0	106	80 - 119				
1,1-Dichloroethane	21.46	1.0	20	0	107	77 - 125				
1,1-Dichloroethene	17.2	1.0	20	0	86.0	71 - 131				
1,1-Dichloropropene	19.2	1.0	20	0	96.0	78 - 125				
1,2,3-Trichlorobenzene	22.55	1.0	20	0	113	69 - 129				
1,2,3-Trichloropropane	21.6	1.0	20	0	108	73 - 122				
1,2,4-Trichlorobenzene	20.24	1.0	20	0	101	69 - 130				
1,2,4-Trimethylbenzene	20.16	1.0	20	0	101	76 - 124				
1,2-Dibromo-3-chloropropane	22.17	1.0	20	0	111	62 - 128				
1,2-Dibromoethane	20.62	1.0	20	0	103	77 - 121				
1,2-Dichlorobenzene	19.98	1.0	20	0	99.9	80 - 119				
1,2-Dichloroethane	20.78	1.0	20	0	104	73 - 128				
1,2-Dichloropropane	20.85	1.0	20	0	104	78 - 122				
1,3,5-Trimethylbenzene	20.04	1.0	20	0	100	75 - 124				
1,3-Dichlorobenzene	19.99	1.0	20	0	99.9	80 - 119				
1,3-Dichloropropane	20.87	1.0	20	0	104	80 - 119				
1,4-Dichlorobenzene	20.01	1.0	20	0	100	79 - 118				
2,2-Dichloropropane	20.23	1.0	20	0	101	60 - 139				
2-Butanone	45.3	2.0	40	0	113	56 - 143				
2-Chlorotoluene	21.49	1.0	20	0	107	79 - 122				
2-Hexanone	42.19	2.0	40	0	105	57 - 139				
4-Chlorotoluene	20.69	1.0	20	0	103	78 - 122				
4-Isopropyltoluene	19	1.0	20	0	95.0	77 - 127				
4-Methyl-2-pentanone	41.6	2.0	40	0	104	67 - 130				
Acetone	41.58	2.0	40	0	104	39 - 160				
Benzene	21.01	1.0	20	0	105	79 - 120				
Bromobenzene	20.5	1.0	20	0	102	80 - 120				
Bromochloromethane	20.61	1.0	20	0	103	78 - 123				
Bromodichloromethane	20.92	1.0	20	0	105	79 - 125				
Bromoform	20.15	1.0	20	0	101	66 - 130				
Bromomethane	19.25	1.0	20	0	96.2	53 - 141				

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QC BATCH REPORT

Batch ID: R352017 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
LCS	Sample ID: VLCSW-191208	Units: UG/L			Analysis Date: 08-Dec-2019 13:54					
Client ID:	Run ID: VOA6_352017	SeqNo: 5378919	PrepDate:	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	41.13	2.0	40	0	103	64 - 133				
Carbon tetrachloride	18.19	1.0	20	0	90.9	72 - 136				
Chlorobenzene	20.01	1.0	20	0	100	82 - 118				
Chloroethane	18.75	1.0	20	0	93.8	60 - 138				
Chloroform	20.32	1.0	20	0	102	79 - 124				
Chloromethane	17.2	1.0	20	0	86.0	50 - 139				
cis-1,2-Dichloroethene	21.73	1.0	20	0	109	78 - 123				
cis-1,3-Dichloropropene	21.38	1.0	20	0	107	75 - 124				
Dibromochloromethane	20.51	1.0	20	0	103	74 - 126				
Dibromomethane	20.47	1.0	20	0	102	79 - 123				
Dichlorodifluoromethane	20.25	1.0	20	0	101	32 - 152				
Ethylbenzene	19.5	1.0	20	0	97.5	79 - 121				
Hexachlorobutadiene	17.49	1.0	20	0	87.5	66 - 134				
Isopropylbenzene	18.78	1.0	20	0	93.9	72 - 131				
m,p-Xylene	39.6	2.0	40	0	99.0	80 - 121				
Methylene chloride	20.93	2.0	20	0	105	74 - 124				
Naphthalene	19.83	1.0	20	0	99.2	61 - 128				
n-Butylbenzene	18.75	1.0	20	0	93.8	75 - 128				
n-Propylbenzene	19.99	1.0	20	0	99.9	76 - 126				
o-Xylene	19.74	1.0	20	0	98.7	78 - 122				
sec-Butylbenzene	18.84	1.0	20	0	94.2	77 - 126				
Styrene	19.61	1.0	20	0	98.0	78 - 123				
tert-Butylbenzene	19.32	1.0	20	0	96.6	78 - 124				
Tetrachloroethene	17.87	1.0	20	0	89.3	74 - 129				
Toluene	19.89	1.0	20	0	99.5	80 - 121				
trans-1,2-Dichloroethene	20.84	1.0	20	0	104	75 - 124				
trans-1,3-Dichloropropene	21.04	1.0	20	0	105	73 - 127				
Trichloroethene	19.99	1.0	20	0	100.0	79 - 123				
Trichlorofluoromethane	16.63	1.0	20	0	83.1	65 - 141				
Vinyl chloride	18.61	1.0	20	0	93.1	58 - 137				
Surr: 1,2-Dichloroethane-d4	52.12	1.0	50	0	104	81 - 118				
Surr: 4-Bromofluorobenzene	50.23	1.0	50	0	100	85 - 114				
Surr: Dibromofluoromethane	49.64	1.0	50	0	99.3	80 - 119				
Surr: Toluene-d8	46.23	1.0	50	0	92.5	89 - 112				

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QC BATCH REPORT

Batch ID: R352017 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MS	Sample ID: HS19120159-02MS	Units: UG/L			Analysis Date: 08-Dec-2019 15:55					
Client ID:	Run ID: VOA6_352017	SeqNo: 5378923	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	16.59	1.0	20	0	82.9	78 - 124				
1,1,1-Trichloroethane	16.34	1.0	20	0	81.7	74 - 131				
1,1,2,2-Tetrachloroethane	17.16	1.0	20	0	85.8	71 - 121				
1,1,2-Trichloroethane	16.74	1.0	20	0	83.7	80 - 119				
1,1-Dichloroethane	16.31	1.0	20	0	81.5	77 - 125				
1,1-Dichloroethene	14.31	1.0	20	0	71.5	71 - 131				
1,1-Dichloropropene	16.8	1.0	20	0	84.0	78 - 125				
1,2,3-Trichlorobenzene	12.42	1.0	20	0	62.1	69 - 129				S
1,2,3-Trichloropropane	16.95	1.0	20	0	84.7	73 - 122				
1,2,4-Trichlorobenzene	13.41	1.0	20	0	67.1	69 - 130				S
1,2,4-Trimethylbenzene	18.45	1.0	20	0	92.2	76 - 124				
1,2-Dibromo-3-chloropropane	14.86	1.0	20	0	74.3	62 - 128				
1,2-Dibromoethane	16.27	1.0	20	0	81.3	77 - 121				
1,2-Dichlorobenzene	18.28	1.0	20	1.376	84.5	80 - 119				
1,2-Dichloroethane	15.86	1.0	20	0	79.3	73 - 128				
1,2-Dichloropropane	16.19	1.0	20	0	81.0	78 - 122				
1,3,5-Trimethylbenzene	18.7	1.0	20	0	93.5	75 - 124				
1,3-Dichlorobenzene	17.71	1.0	20	0	88.5	80 - 119				
1,3-Dichloropropane	16.42	1.0	20	0	82.1	80 - 119				
1,4-Dichlorobenzene	18.35	1.0	20	0	91.8	79 - 118				
2,2-Dichloropropane	16.42	1.0	20	0	82.1	60 - 139				
2-Butanone	31.11	2.0	40	0	77.8	56 - 143				
2-Chlorotoluene	19.64	1.0	20	0	98.2	79 - 122				
2-Hexanone	33.23	2.0	40	0	83.1	57 - 139				
4-Chlorotoluene	18.43	1.0	20	0	92.1	78 - 122				
4-Isopropyltoluene	18.81	1.0	20	0	94.0	77 - 127				
4-Methyl-2-pentanone	37.82	2.0	40	0	94.6	67 - 130				
Acetone	34.12	2.0	40	0	85.3	39 - 160				
Benzene	18.1	1.0	20	1.222	84.4	79 - 120				
Bromobenzene	17.53	1.0	20	0	87.6	80 - 120				
Bromochloromethane	15.18	1.0	20	0	75.9	78 - 123				S
Bromodichloromethane	16.16	1.0	20	0	80.8	79 - 125				
Bromoform	15.63	1.0	20	0	78.1	66 - 130				
Bromomethane	12.68	1.0	20	0	63.4	53 - 141				

ALS Houston, US

Date: 23-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19120354

QC BATCH REPORT

Batch ID: R352017 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MS	Sample ID: HS19120159-02MS	Units: UG/L			Analysis Date: 08-Dec-2019 15:55					
Client ID:	Run ID: VOA6_352017	SeqNo: 5378923	PrepDate:	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	34.77	2.0	40	0	86.9	64 - 133				
Carbon tetrachloride	15.95	1.0	20	0	79.7	72 - 136				
Chlorobenzene	17.81	1.0	20	1.347	82.3	82 - 118				
Chloroethane	14.81	1.0	20	0	74.1	60 - 138				
Chloroform	15.54	1.0	20	0	77.7	79 - 124				S
Chloromethane	11.51	1.0	20	0	57.6	50 - 139				
cis-1,2-Dichloroethene	16.65	1.0	20	0	83.3	78 - 123				
cis-1,3-Dichloropropene	16.12	1.0	20	0	80.6	75 - 124				
Dibromochloromethane	16.2	1.0	20	0	81.0	74 - 126				
Dibromomethane	15.54	1.0	20	0	77.7	79 - 123				S
Dichlorodifluoromethane	12.1	1.0	20	0	60.5	32 - 152				
Ethylbenzene	19.33	1.0	20	2.004	86.6	79 - 121				
Hexachlorobutadiene	12.84	1.0	20	0	64.2	66 - 134				S
Isopropylbenzene	520.2	1.0	20	525.8	-28.1	72 - 131				SEO
m,p-Xylene	36.79	2.0	40	1.974	87.0	80 - 121				
Methylene chloride	17.09	2.0	20	0	85.5	74 - 124				
Naphthalene	13.23	1.0	20	0	66.1	61 - 128				
n-Butylbenzene	18.11	1.0	20	0	90.5	75 - 128				
n-Propylbenzene	29.79	1.0	20	10.97	94.1	76 - 126				
o-Xylene	17.36	1.0	20	0	86.8	78 - 122				
sec-Butylbenzene	22.93	1.0	20	4.293	93.2	77 - 126				
Styrene	16.99	1.0	20	0	84.9	78 - 123				
tert-Butylbenzene	23.78	1.0	20	5.314	92.3	78 - 124				
Tetrachloroethene	16.45	1.0	20	0	82.2	74 - 129				
Toluene	17.28	1.0	20	0	86.4	80 - 121				
trans-1,2-Dichloroethene	16.24	1.0	20	0	81.2	75 - 124				
trans-1,3-Dichloropropene	16.24	1.0	20	0	81.2	73 - 127				
Trichloroethene	16.75	1.0	20	0	83.7	79 - 123				
Trichlorofluoromethane	14.01	1.0	20	0	70.1	65 - 141				
Vinyl chloride	14.58	1.0	20	0	72.9	58 - 137				
Surr: 1,2-Dichloroethane-d4	47.76	1.0	50	0	95.5	81 - 118				
Surr: 4-Bromofluorobenzene	49.64	1.0	50	0	99.3	85 - 114				
Surr: Dibromofluoromethane	48.04	1.0	50	0	96.1	80 - 119				
Surr: Toluene-d8	49.51	1.0	50	0	99.0	89 - 112				

ALS Houston, US

Date: 23-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19120354

QC BATCH REPORT

Batch ID: R352017 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MSD	Sample ID: HS19120159-02MSD	Units: UG/L			Analysis Date: 08-Dec-2019 16:19					
Client ID:	Run ID: VOA6_352017	SeqNo: 5378924		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	16.44	1.0	20	0	82.2	78 - 124	16.59	0.88	20	
1,1,1-Trichloroethane	15.79	1.0	20	0	79.0	74 - 131	16.34	3.43	20	
1,1,2,2-Tetrachloroethane	17.05	1.0	20	0	85.2	71 - 121	17.16	0.66	20	
1,1,2-Trichloroethane	16.75	1.0	20	0	83.8	80 - 119	16.74	0.0575	20	
1,1-Dichloroethane	15.81	1.0	20	0	79.1	77 - 125	16.31	3.09	20	
1,1-Dichloroethene	13.49	1.0	20	0	67.5	71 - 131	14.31	5.88	20	S
1,1-Dichloropropene	16.13	1.0	20	0	80.7	78 - 125	16.8	4.04	20	
1,2,3-Trichlorobenzene	15.49	1.0	20	0	77.5	69 - 129	12.42	22	20	R
1,2,3-Trichloropropane	17.35	1.0	20	0	86.8	73 - 122	16.95	2.38	20	
1,2,4-Trichlorobenzene	14.86	1.0	20	0	74.3	69 - 130	13.41	10.3	20	
1,2,4-Trimethylbenzene	18.23	1.0	20	0	91.2	76 - 124	18.45	1.17	20	
1,2-Dibromo-3-chloropropane	15.75	1.0	20	0	78.8	62 - 128	14.86	5.84	20	
1,2-Dibromoethane	16.14	1.0	20	0	80.7	77 - 121	16.27	0.768	20	
1,2-Dichlorobenzene	18.18	1.0	20	1.376	84.0	80 - 119	18.28	0.578	20	
1,2-Dichloroethane	16.48	1.0	20	0	82.4	73 - 128	15.86	3.89	20	
1,2-Dichloropropane	16.01	1.0	20	0	80.1	78 - 122	16.19	1.11	20	
1,3,5-Trimethylbenzene	18.57	1.0	20	0	92.9	75 - 124	18.7	0.671	20	
1,3-Dichlorobenzene	17.71	1.0	20	0	88.5	80 - 119	17.71	0.0214	20	
1,3-Dichloropropane	16.41	1.0	20	0	82.0	80 - 119	16.42	0.0484	20	
1,4-Dichlorobenzene	18.31	1.0	20	0	91.6	79 - 118	18.35	0.2	20	
2,2-Dichloropropane	15.66	1.0	20	0	78.3	60 - 139	16.42	4.74	20	
2-Butanone	30.55	2.0	40	0	76.4	56 - 143	31.11	1.82	20	
2-Chlorotoluene	19.25	1.0	20	0	96.3	79 - 122	19.64	1.96	20	
2-Hexanone	32.66	2.0	40	0	81.6	57 - 139	33.23	1.74	20	
4-Chlorotoluene	18.16	1.0	20	0	90.8	78 - 122	18.43	1.45	20	
4-Isopropyltoluene	18.74	1.0	20	0	93.7	77 - 127	18.81	0.384	20	
4-Methyl-2-pentanone	37.09	2.0	40	0	92.7	67 - 130	37.82	1.95	20	
Acetone	33.49	2.0	40	0	83.7	39 - 160	34.12	1.87	20	
Benzene	17.46	1.0	20	1.222	81.2	79 - 120	18.1	3.63	20	
Bromobenzene	17.46	1.0	20	0	87.3	80 - 120	17.53	0.351	20	
Bromochloromethane	15.25	1.0	20	0	76.2	78 - 123	15.18	0.423	20	S
Bromodichloromethane	15.7	1.0	20	0	78.5	79 - 125	16.16	2.91	20	S
Bromoform	15.92	1.0	20	0	79.6	66 - 130	15.63	1.83	20	
Bromomethane	11.94	1.0	20	0	59.7	53 - 141	12.68	6.04	20	

ALS Houston, US

Date: 23-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19120354

QC BATCH REPORT

Batch ID: R352017 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MSD	Sample ID: HS19120159-02MSD	Units: UG/L			Analysis Date: 08-Dec-2019 16:19					
Client ID:	Run ID: VOA6_352017	SeqNo: 5378924		PrepDate:		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	33.1	2.0	40	0	82.7	64 - 133	34.77	4.93	20	
Carbon tetrachloride	15.37	1.0	20	0	76.9	72 - 136	15.95	3.69	20	
Chlorobenzene	17.57	1.0	20	1.347	81.1	82 - 118	17.81	1.34	20	S
Chloroethane	17.32	1.0	20	0	86.6	60 - 138	14.81	15.6	20	
Chloroform	15.07	1.0	20	0	75.4	79 - 124	15.54	3.09	20	S
Chloromethane	11.23	1.0	20	0	56.2	50 - 139	11.51	2.43	20	
cis-1,2-Dichloroethene	15.96	1.0	20	0	79.8	78 - 123	16.65	4.26	20	
cis-1,3-Dichloropropene	15.89	1.0	20	0	79.5	75 - 124	16.12	1.45	20	
Dibromochloromethane	15.98	1.0	20	0	79.9	74 - 126	16.2	1.36	20	
Dibromomethane	15.45	1.0	20	0	77.3	79 - 123	15.54	0.567	20	S
Dichlorodifluoromethane	11.27	1.0	20	0	56.4	32 - 152	12.1	7.06	20	
Ethylbenzene	19.12	1.0	20	2.004	85.6	79 - 121	19.33	1.09	20	
Hexachlorobutadiene	14.03	1.0	20	0	70.1	66 - 134	12.84	8.85	20	
Isopropylbenzene	505.7	1.0	20	525.8	-100	72 - 131	520.2	2.81	20	SEO
m,p-Xylene	35.97	2.0	40	1.974	85.0	80 - 121	36.79	2.25	20	
Methylene chloride	16.59	2.0	20	0	82.9	74 - 124	17.09	2.98	20	
Naphthalene	14.48	1.0	20	0	72.4	61 - 128	13.23	9.03	20	
n-Butylbenzene	18.26	1.0	20	0	91.3	75 - 128	18.11	0.824	20	
n-Propylbenzene	29.59	1.0	20	10.97	93.1	76 - 126	29.79	0.681	20	
o-Xylene	16.83	1.0	20	0	84.1	78 - 122	17.36	3.11	20	
sec-Butylbenzene	22.82	1.0	20	4.293	92.7	77 - 126	22.93	0.453	20	
Styrene	16.75	1.0	20	0	83.7	78 - 123	16.99	1.45	20	
tert-Butylbenzene	23.62	1.0	20	5.314	91.6	78 - 124	23.78	0.635	20	
Tetrachloroethene	15.73	1.0	20	0	78.6	74 - 129	16.45	4.49	20	
Toluene	16.78	1.0	20	0	83.9	80 - 121	17.28	2.96	20	
trans-1,2-Dichloroethene	15.92	1.0	20	0	79.6	75 - 124	16.24	1.99	20	
trans-1,3-Dichloropropene	15.71	1.0	20	0	78.5	73 - 127	16.24	3.32	20	
Trichloroethene	15.77	1.0	20	0	78.9	79 - 123	16.75	5.97	20	S
Trichlorofluoromethane	13.19	1.0	20	0	66.0	65 - 141	14.01	6.04	20	
Vinyl chloride	13.69	1.0	20	0	68.4	58 - 137	14.58	6.29	20	
Surr: 1,2-Dichloroethane-d4	47.54	1.0	50	0	95.1	81 - 118	47.76	0.454	20	
Surr: 4-Bromofluorobenzene	49.6	1.0	50	0	99.2	85 - 114	49.64	0.0878	20	
Surr: Dibromofluoromethane	47.75	1.0	50	0	95.5	80 - 119	48.04	0.6	20	
Surr: Toluene-d8	50.03	1.0	50	0	100	89 - 112	49.51	1.05	20	

ALS Houston, US

Date: 23-Dec-19

Client: Bhat Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19120354

QC BATCH REPORT

Batch ID: R352017 (0)	Instrument: VOA6	Method: VOLATILES ORGANICS BY METHOD 8260C		
The following samples were analyzed in this batch:				
HS19120354-01	HS19120354-02	HS19120354-03	HS19120354-04	
HS19120354-05	HS19120354-06	HS19120354-07	HS19120354-09	

ALS Houston, US

Date: 23-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19120354

QC BATCH REPORT

Batch ID: R352218 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MBLK	Sample ID: VBLKW-191210	Units: UG/L			Analysis Date: 10-Dec-2019 14:27					
Client ID:	Run ID: VOA6_352218	SeqNo: 5383347		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	
<i>Surr: 1,2-Dichloroethane-d4</i>	46.74	1.0	50	0	93.5	81 - 118				
<i>Surr: 4-Bromofluorobenzene</i>	49.1	1.0	50	0	98.2	85 - 114				
<i>Surr: Dibromofluoromethane</i>	47.16	1.0	50	0	94.3	80 - 119				
<i>Surr: Toluene-d8</i>	50.98	1.0	50	0	102	89 - 112				
LCS	Sample ID: VLCSW-191210	Units: UG/L			Analysis Date: 10-Dec-2019 13:38					
Client ID:	Run ID: VOA6_352218	SeqNo: 5383346		PrepDate:			DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
Trichloroethene	21.26	1.0	20	0	106	79 - 123				
<i>Surr: 1,2-Dichloroethane-d4</i>	53.48	1.0	50	0	107	81 - 118				
<i>Surr: 4-Bromofluorobenzene</i>	50.97	1.0	50	0	102	85 - 114				
<i>Surr: Dibromofluoromethane</i>	51.28	1.0	50	0	103	80 - 119				
<i>Surr: Toluene-d8</i>	47.82	1.0	50	0	95.6	89 - 112				
MS	Sample ID: HS19120386-01MS	Units: UG/L			Analysis Date: 10-Dec-2019 16:27					
Client ID:	Run ID: VOA6_352218	SeqNo: 5383352		PrepDate:			DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
Trichloroethene	25.5	1.0	20	1.342	121	79 - 123				
<i>Surr: 1,2-Dichloroethane-d4</i>	47.21	1.0	50	0	94.4	81 - 118				
<i>Surr: 4-Bromofluorobenzene</i>	49.39	1.0	50	0	98.8	85 - 114				
<i>Surr: Dibromofluoromethane</i>	47.16	1.0	50	0	94.3	80 - 119				
<i>Surr: Toluene-d8</i>	50.86	1.0	50	0	102	89 - 112				

ALS Houston, US

Date: 23-Dec-19

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP 18 24
 WorkOrder: HS19120354

QC BATCH REPORT

Batch ID: R352218 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C							
MSD	Sample ID: HS19120386-01MSD	Units: UG/L			Analysis Date: 10-Dec-2019 16:51						
Client ID:	Run ID: VOA6_352218	SeqNo: 5383353		PrepDate:			DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
Trichloroethene	20.16	1.0	20	1.342	94.1	79 - 123	25.5	23.4	20	R	
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>46.85</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>93.7</i>	<i>81 - 118</i>	<i>47.21</i>	<i>0.769</i>	<i>20</i>		
<i>Surr: 4-Bromofluorobenzene</i>	<i>49.48</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>99.0</i>	<i>85 - 114</i>	<i>49.39</i>	<i>0.198</i>	<i>20</i>		
<i>Surr: Dibromofluoromethane</i>	<i>46.25</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>92.5</i>	<i>80 - 119</i>	<i>47.16</i>	<i>1.96</i>	<i>20</i>		
<i>Surr: Toluene-d8</i>	<i>50.69</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>101</i>	<i>89 - 112</i>	<i>50.86</i>	<i>0.328</i>	<i>20</i>		

The following samples were analyzed in this batch: HS19120354-06

ALS Houston, US

Date: 23-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19120354

**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 Quantitation 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	19-028-0	27-Mar-2020
California	2919, 2019-2020	30-Apr-2020
Dept of Defense	ANAB L2231	20-Dec-2021
Florida	E87611-28	30-Jun-2020
Illinois	2000322019-2	09-May-2020
Kansas	E-10352 2019-2020	31-Jul-2020
Kentucky	123043, 2019-2020	30-Apr-2020
Louisiana	03087, 2019-2020	30-Jun-2020
Maryland	343, 2019-2020	30-Jun-2020
North Carolina	624-2019	31-Dec-2019
North Dakota	R-193 2019-2020	30-Apr-2020
Oklahoma	2019-067	31-Aug-2020
Texas	TX104704231-19-23	30-Apr-2020

Sample Receipt Checklist

Client Name: Bhate Environmental
 Work Order: HS19120354

Date/Time Received: **06-Dec-2019 08:48**
 Received by: **AC**

Checklist completed by: Asad Chaudhry 7-Dec-2019
 eSignature Date

Reviewed by: RJ Modashia 9-Dec-2019
 eSignature Date

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 1 Page(s)
- Chain of custody signed when relinquished and received? Yes No COC IDs:N/A
- 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): 3.1c U/C IR 25
 Cooler(s)/Kit(s): 45572
 Date/Time sample(s) sent to storage: 12/06/2019 19:00

- 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:



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

HS19120354

Bhate Environmental Associates, Inc.
 LHAAP 18 24




Facility/Base I.D.: LHAAP							Sample Analysis Requested ⁽¹⁾																
Project/Site Name: LHAAP / Site 18/24							Number of containers	VOC	PERCHLORATE	TOTAL METALS	1, 4 - DIOXANE									Ambient Blank Lot Control Number	Equipment Blank Lot Control Number	Trip Blank Lot Control Number	Coder ID
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⁾																	
18CPTMW22R-120519	05DEC2019	0750	-	N	WG	6	X	X	X	X													
MW20-120519	05DEC2019	0835	-	N	WG	4	X	X															
MW20-120519-ew	05DEC2019	0835	-	FD	WG	4	X	X															
18CPTMW22SW-120519	05DEC2019	0925	-	N	WG	6	X	X	X	X													
MW8-120519	05DEC2019	1030	-	N	WG	5	X	X		X													
MW9-120519	05DEC2019	1130	-	N	WG	6	X	X	X	X													
MW10-120519	05DEC2019	1215	-	N	WG	5	X	X		X													
MW17-120519	05DEC2019	1305	-	N	WG	2		X		X													
TR: p BLANK	05DEC2019		-	TB	W	2	X																

COMMENTS: _____

Custody Transfers Prior to Receipt by Laboratory				Sample Delivery Details / Laboratory Receipt			
Relinquished By (Signed)	Date	Time	Received by (signed)	Date	Time	Delivered Directly to Lab:	Shipped
<i>Scott Beesinger</i>	12/5/19	1430	<i>AC</i>	12/6/19	08:48		
2. _____			2. _____			Method of Shipment:	
3. _____			3. _____			Fed	Ex
						Analytical Lab:	ALS 10450 Stancliff Rd, Suite 210 Houston, TX 77099 (281) 530-5656
						Lab Recipient:	ATTN: SONIA WEST
						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 (ddmmvy) 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

 ALS 10450 Stancliff Rd., Suite 210 Houston, Texas 77099 Tel. +1 281 530 5656 Fax. +1 281 530 5887	CUSTODY SEAL		Seal Broken By: <i>SM</i>
	Date: <i>12/5/19</i>	Time: <i>1430</i>	Date: <i>12/06/19</i>
<i>45572</i>	Name: <i>Scott Beesiner</i>		
	Company: <i>BH&A</i>		

45572 DEC 06 2019



**Must Deliver Next Business Day
Time and Temperature Sensitive!**

45572


Part # 169439-434 RIT EXP 0720 **

ORIGIN ID:SGRA (903) 930-6193
SCOTT BEESINER
BH&E ENVIRONMENTAL ASSOCIATES
1203-B EAST GRAND AVE. PMB202
MARSHALL, TX 75670
UNITED STATES US

SHIP DATE: 02DEC19
ACTWT: 1.00 LB MAN
CAD: 300130/CATF3211
DIMS: 26x14x14 IN

TO CLIENT SERVICES
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON TX 77099
 (281) 530-5656
 REF: LHAAP - 18/24 - B0 68900 - RJ

RMA: 



RETURNS MON - SAT
FRI - 06 DEC 10:30A
PRIORITY OVERNIGHT



AB SGRA



77099
TX-US
IAH

#10 162785 05DEC19 666A 56AC2/13DD/05A2



Case Narrative

Method: 6850
Analysis: Perchlorate
Analysis SOP: LC-MS-CLO4
ALS WO ID(s): 1934606; 1934611

Client: ALS Laboratories (Houston, TX)
Matrix: Water
ELMS Batch (HBN): 2328 (253958)

General Set Information: There were fourteen field samples in these Work Orders. The samples were analyzed for perchlorate.

Method Summary: Each sample was prepared as noted below and analyzed using an Agilent 1100 LC/MSD system in select ion monitoring (SIM) mode at m/z 83 and 85, which corresponds to the loss of one oxygen atom from the perchlorate molecule. ChemStation software was used for instrument control and data analysis. The ion ratio of m/z 83 to 85 was used to positively identify the response peak as perchlorate. Quantitation was performed using the m/z 83 peak area. An internal standard (ISTD) of ^{18}O labeled perchlorate was added to each sample to establish the perchlorate peak retention time and used in quantitation.

Sample Preparation: A 10.0mL aliquot of each sample was transferred into a 15-mL centrifuge tube. 50 μL of an ^{18}O labeled perchlorate solution was added to each sample as an internal standard. The samples were then capped, vortexed, and filtered into autosampler vial using Phenex PES membrane 0.45 μm Syringe filters.

Holding Times: Holding times were met for all analyses.

Dilutions: Field sample 1934606006 was analyzed and reported from a 1:10 dilution. Field sample 1934606005 was analyzed and reported from a 1:100 dilution. Field samples 1934611003/06 were analyzed and reported from 1:1,000 dilutions. The reporting limits have been adjusted accordingly.

Method QC data: The method blank (LMB 689015) was less than 1/2 the CRDL. The recovery for the LCS (689012) was within acceptable parameters.



MS/MSD Analysis: MS/MSD was performed on sample 1934606001 (Client ID: 18CPTMW22R_120519). 3.0 μ L of Working Standard Solution Horizon ID 49947 was added to 10.0mL of sample preparation. The MS/MSD (687323/24) failed QC acceptance criteria for percent recoveries. The relative percent difference (RPD) passed acceptance criteria. The Matrix Spike and Matrix Spike duplicate is reported for the clients' information only. The sample matrix may be inappropriate for the method selected.

Instrument QC: Instrument initial and continuing calibrations were performed in accordance with published procedures.

NC/CAR(s): NA

Sample Calculation: Samples were reported in μ g/L. Results were calculated in μ g/L by the equation (A)x(B),

where: A = Analyte concentration from the standard curve (μ g/L)
B = Dilution performed at time of analysis

Miscellaneous Comments: These samples were analyzed in accordance with the requirements found in the DOD QSM Version 5.1.1. The Reporting Limit Verification Standard (RLVS – 689013) is reported from the analysis of the Laboratory Control Sample (LCS – 689012) at a level of 3.0 μ g/L. Due to limitations of the Chemstation Software, some of the chromatographic peaks may require manual integrations. A manual integration was performed for one of the Initial Calibration analyses (datafile: 20SEPI03) along with datafile 19DEC19D17.

Thomas Bosch December 21, 2019
Analyst Date



ANALYTICAL REPORT

Report Date: December 23, 2019

RJ Modashia
 ALS Environmental (Houston)
 10450 Stancliff Road
 Suite 210
 Houston, TX 77099

Phone: 281 530-5656

E-mail: RJ.Modashia@ALSGlobal.com

Workorder: **34-1934606**

Project ID: HS19120354

Purchase Order: HS19120354

Project Manager Kevin W. Griffiths

Client Sample ID	Lab ID	Collect Date	Receive Date	Sampling Site
18CPTMW22R_120519	1934606001	12/05/19	12/11/19	
MW20_120519	1934606002	12/05/19	12/11/19	
MW20_120519_a	1934606003	12/05/19	12/11/19	
18CPTMW22SW_120519	1934606004	12/05/19	12/11/19	
MW8_120519	1934606005	12/05/19	12/11/19	
MW9_120519	1934606006	12/05/19	12/11/19	
MW10_120519	1934606007	12/05/19	12/11/19	
MW17_120519	1934606008	12/05/19	12/11/19	

ADDRESS 960 West LeVoy Drive, Salt Lake City, Utah, 84123 USA | PHONE +1 801 266 7700 | FAX +1 801 268 9992

ALS GROUP USA, CORP. An ALS Limited Company

Environmental 

www.alsglobal.com

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ANALYTICAL REPORT

Workorder: 34-1934606

Client: ALS Environmental
(Houston)

Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: 18CPTMW22R_120519	Sampling Site: NA	Collected: 12/05/2019				
Lab ID: 1934606001	Media: 125 mL Nalgene	Received: 12/11/2019				
Matrix: Water	Sampling Parameter: NA					
Analysis Method - EPA 6850, DoD QSM						
Preparation: Not Applicable	Analysis: EPA 6850, DoD QSM Water Batch: ELMS/2328 (HBN: 253958) Analyzed: 12/19/2019 09:46	Instrument ID: LCMS04 %Solids: NA Report Basis: Wet				
Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Sample ID: MW20_120519	Sampling Site: NA	Collected: 12/05/2019				
Lab ID: 1934606002	Media: 125 mL Nalgene	Received: 12/11/2019				
Matrix: Water	Sampling Parameter: NA					
Analysis Method - EPA 6850, DoD QSM						
Preparation: Not Applicable	Analysis: EPA 6850, DoD QSM Water Batch: ELMS/2328 (HBN: 253958) Analyzed: 12/19/2019 10:28	Instrument ID: LCMS04 %Solids: NA Report Basis: Wet				
Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Sample ID: MW20_120519_a	Sampling Site: NA	Collected: 12/05/2019				
Lab ID: 1934606003	Media: 125 mL Nalgene	Received: 12/11/2019				
Matrix: Water	Sampling Parameter: NA					
Analysis Method - EPA 6850, DoD QSM						
Preparation: Not Applicable	Analysis: EPA 6850, DoD QSM Water Batch: ELMS/2328 (HBN: 253958) Analyzed: 12/19/2019 10:42	Instrument ID: LCMS04 %Solids: NA Report Basis: Wet				
Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Sample ID: 18CPTMW22SW_120519	Sampling Site: NA	Collected: 12/05/2019				
Lab ID: 1934606004	Media: 125 mL Nalgene	Received: 12/11/2019				
Matrix: Water	Sampling Parameter: NA					
Analysis Method - EPA 6850, DoD QSM						
Preparation: Not Applicable	Analysis: EPA 6850, DoD QSM Water Batch: ELMS/2328 (HBN: 253958) Analyzed: 12/19/2019 10:55	Instrument ID: LCMS04 %Solids: NA Report Basis: Wet				
Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	33	1.0	2.0	4.0	1	



ANALYTICAL REPORT

Workorder: **34-1934606**Client: ALS Environmental
(Houston)

Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: MW8_120519	Sampling Site: NA	Collected: 12/05/2019				
Lab ID: 1934606005	Media: 125 mL Nalgene	Received: 12/11/2019				
Matrix: Water	Sampling Parameter: NA					
Analysis Method - EPA 6850, DoD QSM						
Preparation: Not Applicable	Analysis: EPA 6850, DoD QSM Water Batch: ELMS/2328 (HBN: 253958) Analyzed: 12/19/2019 11:09	Instrument ID: LCMS04 %Solids: NA Report Basis: Wet				
Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	4100	100	200	400	100	

Sample ID: MW9_120519	Sampling Site: NA	Collected: 12/05/2019				
Lab ID: 1934606006	Media: 125 mL Nalgene	Received: 12/11/2019				
Matrix: Water	Sampling Parameter: NA					
Analysis Method - EPA 6850, DoD QSM						
Preparation: Not Applicable	Analysis: EPA 6850, DoD QSM Water Batch: ELMS/2328 (HBN: 253958) Analyzed: 12/19/2019 13:42	Instrument ID: LCMS04 %Solids: NA Report Basis: Wet				
Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	320	10	20	40	10	

Sample ID: MW10_120519	Sampling Site: NA	Collected: 12/05/2019				
Lab ID: 1934606007	Media: 125 mL Nalgene	Received: 12/11/2019				
Matrix: Water	Sampling Parameter: NA					
Analysis Method - EPA 6850, DoD QSM						
Preparation: Not Applicable	Analysis: EPA 6850, DoD QSM Water Batch: ELMS/2328 (HBN: 253958) Analyzed: 12/19/2019 11:37	Instrument ID: LCMS04 %Solids: NA Report Basis: Wet				
Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Sample ID: MW17_120519	Sampling Site: NA	Collected: 12/05/2019				
Lab ID: 1934606008	Media: 125 mL Nalgene	Received: 12/11/2019				
Matrix: Water	Sampling Parameter: NA					
Analysis Method - EPA 6850, DoD QSM						
Preparation: Not Applicable	Analysis: EPA 6850, DoD QSM Water Batch: ELMS/2328 (HBN: 253958) Analyzed: 12/19/2019 11:51	Instrument ID: LCMS04 %Solids: NA Report Basis: Wet				
Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U



ANALYTICAL REPORT

Workorder: **34-1934606**Client: ALS Environmental
(Houston)

Project Manager: Kevin W. Griffiths

Comments

Quality Control: EPA 6850, DoD QSM - (HBN: 253958)

Field sample 1934606006 was analyzed and reported from a 1:10 dilution. Field sample 1934606005 was analyzed and reported from a 1:100 dilution. Field samples 1934611003/06 were analyzed and reported from 1:1,000 dilutions. The reporting limits have been adjusted accordingly.

Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Method	Analyst	Peer Review
EPA 6850, DoD QSM	/S/ Thomas Bosch 12/20/2019 15:39	/S/ Stephen Brose 12/23/2019 09:16

Laboratory Contact Information

ALS Environmental
960 W Levoy Drive
Salt Lake City, Utah 84123

Phone: (801) 266-7700
Email: als@t.lab@ALSGlobal.com
Web: www.als.com

General Lab Comments

The results provided in this report relate only to the items tested.
Samples were received in acceptable condition unless otherwise noted.
Samples have not been blank corrected unless otherwise noted.
This test report shall not be reproduced, except in full, without written approval of ALS.

ALS provides professional analytical services for all samples submitted. ALS is not in a position to interpret the data and assumes no responsibility for the quality of the samples submitted.

All quality control samples processed with the samples in this report yielded acceptable results unless otherwise noted.

ALS is accredited for specific fields of testing (scopes) in the following testing sectors. The quality system implemented at ALS conforms to accreditation requirements and is applied to all analytical testing performed by ALS. The following table lists testing sector, accreditation body, accreditation number and website. Please contact these accrediting bodies or your ALS project manager for the current scope of accreditation that applies to your analytical testing.

Testing Sector	Accreditation Body (Standard)	Certificate Number	Website
Environmental	PJLA (DoD ELAP)	L17-506	http://www.pjllabs.com
	PJLA (ISO 17025)	L17-507-R1	http://www.pjllabs.com
	Utah (TNI)	UT00953	http://lams.nelac-institute.org/search
	Iowa (TNI)	IA# 376	http://www.shl.uiowa.edu/labcert/idnr/
	Kansas	E-10416	http://www.kdheks.gov/envlab/disclaimer.html
Industrial Hygiene	AIHA (ISO 17025 & AIHA IHLAP)	101574	http://www.aihaaccreditedlabs.org
	DOECAP-AP	L18-606	http://www.pjllabs.com
	Washington	C596	https://ecology.wa.gov/Regulations-Permits/Permits-certifications/Laboratory-Accreditation
Dietary Supplements	PJLA (ISO 17025)	L17-507-R1	http://www.pjllabs.com



ANALYTICAL REPORT

Workorder: 34-1934606

Client: ALS Environmental
(Houston)

Project Manager: Kevin W. Griffiths

Result Symbol Definitions

MDL = Method Detection Limit, a statistical estimate of method/media/instrument sensitivity.

RL = Reporting Limit, a verified value of method/media/instrument sensitivity.

CRDL = Contract Required Detection Limit

Reg. Limit = Regulatory Limit.

ND = Not Detected, testing result not detected above the MDL or RL.

< Means this testing result is less than the numerical value.

** No result could be reported, see sample comments for details.

Qualifier Symbol Definitions

U = Qualifier indicates that the analyte was not detected above the MDL.

J = Qualifier Indicates that the analyte value is between the MDL and the RL. It is also used to indicate an estimated value for tentatively identified compounds in mass spectrometry where a 1:1 response is assumed.

B = Qualifier indicates that the analyte was detected in the blank.

E = Qualifier indicates that the analyte result exceeds calibration range.

P = Qualifier indicates that the RPD between the two columns is greater than 40%.



Quality Control Sample Batch Report

00957385

Analysis Information

Workorder: 1934606

Limits: Client SOW/Contract Specified
Basis: DoD QSM

Preparation: NA
Batch: NA
Prepared By: NA

Analysis: EPA 6850, DoD QSM
Batch: ELMS/2328 (HBN: 253958)
Analyzed By: Thomas Bosch

Blank

LMB: 689015 Analyzed: 12/19/2019 09:32 Units: ug/L			
Analyte	Result	MDL	RL
Perchlorate	ND	1	2.00

Laboratory Control Sample

LCS: 689012 Analyzed: 12/19/2019 09:04 Dilution: 1 Units: ug/L				
Analyte	Result	Target	% Rec	QC Limits
Perchlorate	3.17	3.00	106	78.8 123.8

Matrix Spike - Matrix Spike Duplicate

Sample: 1934606001 Analyzed: 12/19/2019 09:46 Dilution: 1 Units: ug/L			MS: 689016 Analyzed: 12/19/2019 10:00 Dilution: 1 Units: ug/L				MSD: 689017 Analyzed: 12/19/2019 10:14 Dilution: 1 Units: ug/L			
Analyte	Result	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits	
Perchlorate	ND	2.6	3	86.8	78.8 123.8	3.06	102	16	0.0 20.0	

Comments

Field sample 1934606006 was analyzed and reported from a 1:10 dilution. Field sample 1934606005 was analyzed and reported from a 1:100 dilution. Field samples 1934611003/06 were analyzed and reported from 1:1,000 dilutions. The reporting limits have been adjusted accordingly.

QC Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Analyst	Peer Review
/S/ Thomas Bosch 12/21/2019 13:06	/S/ Stephen Brose 12/23/2019 09:16

Symbols and Definitions

- * - Analyte above reporting limit or outside of control limits
- ▲ - Sample result is greater than 4 times the spike added
- - Sample and Matrix Duplicate less than 5 times the reporting limit
- - Result is above the calibration range
- # - The Matrix Spike, Matrix Spike duplicate or Matrix Duplicate is reported for your information only. The sample matrix may be inappropriate for the method selected.

- RPD - Relative % Difference (Spike / Spike Duplicate)
- ND - Not Detected (U - Qualifier also flags analyte as not detected)
- NA - Not Applicable
- QC results are not adjusted for moisture correction, where applicable



1934606



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

18698/#2

SAMPLING STATE: Texas

COC ID: 12796

SUBCONTRACT TO:

1934606

ALS Laboratory Group
960 LeVoy Dr
Salt Lake City, UT 84123

Phone: +1 801 266 7700

CUSTOMER INFORMATION:

Company: ALS Houston
Contact: RJ Modashia
Address: 10450 Stancliff Rd, Ste 210
Phone: +1 281 530 5656
Email: RJ.Modashia@alsglobal.com
Alternate Contact: Jumoke M. Lawal
Email: jumoke.lawal@alsglobal.com

INVOICE INFORMATION:

Company: ALS Houston
Contact: Accounts Payable
Address: 10450 Stancliff Rd, Ste 210
Phone: +1 281 530 5656
Reference: HS19120354
TSR: Danielle Winnings

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
0	1. HS19120354-01	18CPTMW22R_120519	GW	05 Dec 2019 07:50
	SUB_Perch-6850			20 Dec 2019
0	2. HS19120354-02	MW20_120519	GW	05 Dec 2019 08:35
	SUB_Perch-6850			20 Dec 2019
0	3. HS19120354-03	MW20_120519	GW	05 Dec 2019 08:35
	SUB_Perch-6850			20 Dec 2019
0	4. HS19120354-04	18CPTMW22SW_120519	GW	05 Dec 2019 09:25
	SUB_Perch-6850			20 Dec 2019
0	5. HS19120354-05	MW8_120519	GW	05 Dec 2019 10:30
	SUB_Perch-6850			20 Dec 2019
0	6. HS19120354-06	MW9_120519	GW	05 Dec 2019 11:30
	SUB_Perch-6850			20 Dec 2019
0	7. HS19120354-07	MW10_120519	GW	05 Dec 2019 12:15
	SUB_Perch-6850			20 Dec 2019
0	8. HS19120354-08	MW17_120519	GW	05 Dec 2019 13:05
	SUB_Perch-6850			20 Dec 2019

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07 Dec 2019

Page 1 of 2



Subcontract Chain of Custody

SAMPLING STATE: Texas

COC ID: 12796

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

QC Level: DOD IV (DoD Data Package)

Relinquished By:

Date/Time:

12/10/19 1800.

Received By:

Date/Time:

12/11/19 0902

Cooler ID(s):

Temperature(s):

ALS-SALT LAKE CITY-RELATED INFORMATION REPORT (CRIR)

COOLER OR CONTAINER INFORMATION CHECKLIST (Fill In or Circle)

Client Name: <u>ALS Houston</u>		Project/Task/Site: <u>HS19120354</u>				
Date/Time of Receipt: <u>12/11/19 0902</u>		Number of Coolers Received: <u>1</u> <u>1934606</u>				
Condition of Coolers: <u>Acceptable</u> /Unacceptable		Temperature Control: <u>Present</u> /Not Included				
Cooler Custody Seals: <u>Present</u> /Absent/NA		Location Temp Taken: <u>Control</u> /Between Samples				
Container Custody Seals: <u>Intact</u> /Broken/NA		Are all temperatures within project specific guidelines? Yes/No/NA				
Ice Present: <u>Yes</u> /No/NA		VOA Headspace Present? Yes/No/NA				
pH Check Performed:	Metals	Yes/No/NA	Total Phenolics	Yes/No/NA	NO3/NO2	Yes/No/NA
	Cyanide	Yes/No/NA	TPH - 418.1	Yes/No/NA	Oil & Grease	Yes/No/NA
	Sulfide	Yes/No/NA	COD	Yes/No/NA	Total Phosphorous	Yes/No/NA
	Ammonia	Yes/No/NA	TKN	Yes/No/NA	Gross A.B, Gamma Spec	Yes/No/NA

Cooler Received	Cooler Condition	Temp.	Cooler Received	Cooler Condition	Temp.	Cooler Received	Cooler Condition	Temp.
1	<u>Good</u>	<u>2</u> °C	4		°C	7		°C
2		°C	5		°C	8		°C
3		°C	6		°C	9		°C

Taken By: [Signature] Signature Rebecca Wise Printed Name 12/11/19 Date

CLIENT-RELATED INFORMATION

- | | | | |
|---|--|---|--|
| <input type="checkbox"/> Missing Cooler
<input type="checkbox"/> Cooler Conditions
<input type="checkbox"/> Missing Paperwork
<input type="checkbox"/> Missing/Incorrect Bottle Labels | <input type="checkbox"/> Missing Samples/Bottles
<input type="checkbox"/> Broken/Leaking Samples
<input type="checkbox"/> Incorrect Bottle Type
<input type="checkbox"/> Cooler Temperatures Out of Range | <input type="checkbox"/> Incorrect Preservation
<input type="checkbox"/> pH Criteria Not Met
<input type="checkbox"/> Residual Chlorine Present
<input type="checkbox"/> Head Space in Bottles | <input type="checkbox"/> Insufficient Sample Volume
<input type="checkbox"/> Chain of Custody Problems
<input type="checkbox"/> Other: |
|---|--|---|--|

BRIEFLY DESCRIBE THE PROBLEM AND THE ACTION TAKEN:

HS19120354-03 received as MW20-120519-a

Client Notified? YES NO

Response Required Within 24 Hours

PROJECT MANAGEMENT

PROJECT MANAGER COMMENTS:

ALS Project Manager: _____ Returned to Sample Receipt by: _____ Date: _____
Printed Name Signature

FORM 4325-9-31 12/2/83 10:20



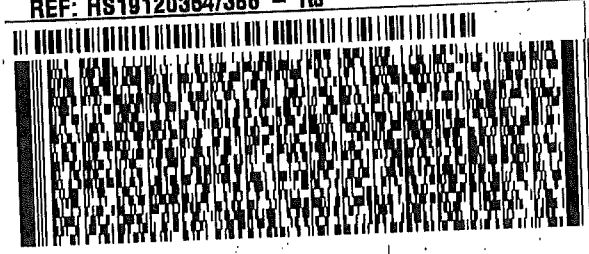
ORIGIN ID:SGRA (281) 530-5656
SHIPPING DEPT
ALS LABORATORY GRDUP
10450 STANCLIFF RD
SUITE 210
HOUSTON, TX 77099
UNITED STATES US

SHIP DATE: 10DEC19
ACTWT: 18.03 LB
CAD: 300130/CAFE3211
DIMS: 14x11x10 IN
BILL THIRD PARTY

TO **SAMPLE RECEIVING
ALS ENVIRONMENTAL
960 W. LEVOY DRIVE**

SALT LAKE CITY UT 84123

(801) 280-7700
REF: HS19120354/386 - RJ



**FedEx
Express**



J187118066501111

**WED - 11 DEC 3:00P
STANDARD OVERNIGHT**

TRK# 1251 0292 7941
0201

AX BTFA

**84123
US SLC**





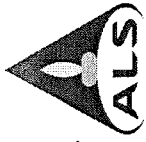
ALS Environmental
CHAIN-OF-CUSTODY

Project / Job / Task: HS19120354		Split:	Workorder ID: 1934606	Level: ENV_LVL4	Requested Analysis	
Client: ALS Environmental (Houston)		Account: 8101		Type: 125Poly		
Comments:						
Item	Collect Date/Time	Sample ID	Lab ID	QC	Matrix	Count
1	12/05/2019 07:50	18CPTMW22R_120519	1934606001		Water	1
2	12/05/2019 08:35	MW20_120519	1934606002		Water	1
3	12/05/2019 08:35	MW20_120519_a	1934606003		Water	1
4	12/05/2019 09:25	18CPTMW22SW_120519	1934606004		Water	1
5	12/05/2019 10:30	MW8_120519	1934606005		Water	1
6	12/05/2019 11:30	MW9_120519	1934606006		Water	1
7	12/05/2019 12:15	MW10_120519	1934606007		Water	1
8	12/05/2019 13:05	MW17_120519	1934606008		Water	1
9						
10						

FPA 8850, DOD OSM

62 of 155

ORIGINAL FIELD SAMPLE CHAIN-OF-CUSTODY				SAMPLE PREPARATION / ANALYSIS CHAIN-OF-CUSTODY			
Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location	Sample Prep / Analysis for:	Lab Notebook No.:	Prepared / Analyzed by:	Date / Time:
<i>John W. Adams</i>	12/11/2019 09:02	ALS Sample Receiving	Storage				
<i>R.33-1</i>	12/16/19 17:05	<i>T. Bush</i>	cloth analysis				



Batch Worklist

HBN: 253958

Instrument: WP

Created: 12/19/2019 07:41

Batch: ELMS/2328

Status: WP

Analyst: T. Bosch

Rule: EPA 6850, DoD QSM Water

Workorder: 1934606 [ENV_LVL4]

Workorder: 1934611 [ENV_LVL4]

Pos	Lab ID	Sample ID	Prep Initial	Prep Final	Dust Weight	Type	Mx	Container	Procedure	Mgr	Expire Date	Due Date	Run Date
1	689011	CCV for HBN 253958 [ELMS/2328]				CCV	3	E685041C3Q	E685041C3Q	5311		12/24/2019	
2	689012	LCS for HBN 253958 [ELMS/2328]				LCS	3	E6850Q413Q	E6850Q413Q	5311		12/24/2019	
3	689013	RLVS for HBN 253958 [ELMS/2328]				RLVS	3	E685041C3Q	E685041C3Q	5311		12/24/2019	
4	689014	ICS for HBN 253958 [ELMS/2328]				ICS	3	E6850.D3Q	E6850.D3Q	5311		12/24/2019	
5	689015	LMB for HBN 253958 [ELMS/2328]				LMB	3	E6850Q413Q	E6850Q413Q	5311		12/24/2019	
6	1934606001	18CPTMW22R_120519				SAMPLE	3	1934606001-A	E6850Q41.3	5480	1/2/2020	12/24/2019	
7	689016	18CPTMW22R_12...(1934606001MS)				MS	3	E6850Q413Q	E6850Q413Q	5311		12/24/2019	
8	689017	18CPTMW22R_1...(1934606001MS)				MSD	3	E6850Q413Q	E6850Q413Q	5311		12/24/2019	
9	1934606002	MW20_120519				SAMPLE	3	1934606002-A	E6850Q41.3	5480	1/2/2020	12/24/2019	
10	1934606003	MW20_120519_a				SAMPLE	3	1934606003-A	E6850Q41.3	5480	1/2/2020	12/24/2019	
11	1934606004	18CPTMW22SW_120519				SAMPLE	3	1934606004-A	E6850Q41.3	5480	1/2/2020	12/24/2019	
12	1934606005	MW8_120519				SAMPLE	3	1934606005-A	E6850Q41.3	5480	1/2/2020	12/24/2019	
13	1934606006	MW9_120519				SAMPLE	3	1934606006-A	E6850Q41.3	5480	1/2/2020	12/24/2019	
14	1934606007	MW10_120519				SAMPLE	3	1934606007-A	E6850Q41.3	5480	1/2/2020	12/24/2019	
15	1934606008	MW17_120519				SAMPLE	3	1934606008-A	E6850Q41.3	5480	1/2/2020	12/24/2019	
16	689018	CCV for HBN 253958 [ELMS/2328]				CCV	3	E685041C3Q	E685041C3Q	5311		12/24/2019	
17	1934611001	18CPTMW12SW_120619				SAMPLE	3	1934611001-A	E6850Q41.3	5480	1/3/2020	12/24/2019	
18	1934611002	18CPTMW12DW_120619				SAMPLE	3	1934611002-A	E6850Q41.3	5480	1/3/2020	12/24/2019	
19	1934611003	MW7_120619				SAMPLE	3	1934611003-A	E6850Q41.3	5480	1/3/2020	12/24/2019	
20	1934611004	18CPTMW10SW_120619				SAMPLE	3	1934611004-A	E6850Q41.3	5480	1/3/2020	12/24/2019	
21	1934611005	18CPTMW10DW_120619				SAMPLE	3	1934611005-A	E6850Q41.3	5480	1/3/2020	12/24/2019	
22	1934611006	18WW7_120619				SAMPLE	3	1934611006-A	E6850Q41.3	5480	1/3/2020	12/24/2019	
23	689019	CCV for HBN 253958 [ELMS/2328]				CCV	3	E685041C3Q	E685041C3Q	5311		12/24/2019	



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Analytical Documentation

Analyst Write-up

ALS Work Order #'s & Sample #()'s: 1934606 (001-08); 1934611 (001-06);

ELMS Batch/HBN ID: 2328 (253958)

Prep Date: 12/16/2019 Analysis Date: 12/19/2019 Analyst: Tom Bosch

Analyte: **Perchlorate** Matrix: **Water** Method: **6850**

Sequence: \\HPCHEM\1\SEQUENCE\CLO4\2019\DEC\19DEC19D.s

Reported DL: **1.0µg/L** Reported LOD: **2.0µg/L** Reported LOQ: **4.0µg/L**

SAMPLE PREPARATION/ANALYSIS:

Water: Samples were prepared by Tom Bosch. 10.0mL of each sample was pipetted into a 15-mL centrifuge tube, and 50µL of an oxygen-18 labeled perchlorate solution was added as an internal standard. The samples were capped, vortexed, and filtered with Phenex PES membrane 0.45µm Syringe filters prior to analysis.

REAGENTS: Eluent A1: 95% ASTM Type II water (ALS)/5%ACN (B&J Lot DU461-US)/0.1% glacial acetic acid (JT-Baker Lot 122550).
Eluent B1: 95% ACN (B&J Lot DU461-US)/5% ASTM Type II water (ALS)/0.1% glacial acetic acid (JT-Baker Lot 122550).

STANDARDS: Internal Standard Spiking Solution Horizon# 47863. Dilutions of Working Standards (Horizon: 49947/48) used for ICAL, CCV's, RLVS and ICS.

CALIBRATION CURVE: Used curve from 09/20/2019, sequence 20SEP19D.s Offline Quantitation Method: CLO4-DP3.M

INSTRUMENT CONDITIONS: Samples were analyzed with an Agilent 1100 LC/MSD system, in negative SIM mode, monitoring m/z 83, 85, and 89.

Instrument ID: LCMS04 Online Acquisition Method: CLO4-AQN.M Fragmentor: 160 Output Gain: 8 Injection Volume: 35µL
Column: KP-RPPX C8 separator, 250mm Mobile Phase: 70% Eluent A1; 30% Eluent B1 Run time: 12.0min.

FLOW GRADIENT:

Time (min.)	Flow (mL/min)
0	0.65
5.8	0.65
5.9	0.25
10.3	0.25
10.5	0.65
12.0	0.65

QC DATA: 3.0µL of QC Solution Horizon ID 47516 was used for LCS 689012; Target = 3.0µg/L. ASTM type II water was used for LMB 689015.

MS/MSD: The Matrix Spike and duplicate (MS/MSD) was performed on sample 1934606001 (Client ID's: 18CPTMW22R_120519). 3.0µl of Working Standard Solution Horizon ID 49947 was added to 10.0mL of sample preparation. Spike target = 3.0µg/L.

COMMENTS:

- 1) Results reported in µg/L. Field sample 1934606006 was analyzed and reported from a 1:10 dilution. Field sample 1934606005 was analyzed and reported from a 1:100 dilution. Field samples 1934611003/06 were analyzed and reported from 1:1,000 dilutions. The reporting limits have been adjusted accordingly.
- 2) All QC, Blank, CCV, and MS/MSD results were within method parameters.
- 3) Sample data can be viewed at two directories within the ALS system: \\ALSLTWS013\LCMS\LCMS04\2019\DEC\HBN# or through NuGenesis\Tree\PrintData\LCMS\DefaultView.
- 4) Notebook: \\alsltws013\ORGANIC\BOSCH\LCMS\Perchlorates\Waters\2019\253958-DoD-ALS-Hstn LCMS4 or through \\ALSLTWS013\DATAREVIEW\HBN#
- 5) The Reporting Limit Verification Standard (RLVS – 689013) is reported from the analysis of the Laboratory Control Sample (LCS – 689012) at a level of 3.0µg/L.
- 6) Due to limitations of the Chemstation Software, some of the chromatographic peaks require manual integration. Manual Integrations were performed for one of the Initial Calibration analyses (datafile: 20SEPI03) along with datafile 19DEC19D17.

5.5 Chromatography (GC, HPLC and LC/MS) Technical Review

Note: It is the peer reviewer's responsibility to ensure that appropriate criteria are used as defined in the HORIZON PROFILE. The evaluation criteria are prioritized as per Section 2.2 of this SOP. These items must be checked for all projects. The following checklist will be completed by both the analyst and the peer reviewer and scanned into the HBN folder with the raw data.

Chromatography (GC, HPLC, LC/MS) Technical Review Criteria	Analyst Initials	Reviewer Initials
Batch(es)/SDG: <u>ELMS: 2328 HBN: 253958</u>		
Sample Set IDs if Applicable: <u>1934606/1934611</u>		
Sample positions on autosampler verified against instrument sequence	TB	NA
Calibration standards analyzed and meets criteria	TB	SB
Standards traceability checked and meets criteria	TB	SB
Standard curve coefficients evaluated and meet criteria	TB	SB
ICVs analyzed and meet acceptance criteria	TB	SB
CCVs analyzed and meet acceptance criteria	TB	SB
Retention Time Windows checked	—	—
For method 8081A, Endrin/DDT Breakdown is checked for compliance	—	—
Surrogate recoveries checked and appropriately addressed	TB	SB
Method Preparation Blanks analyzed and meet acceptance criteria	TB	SB
MSs, MSDs, and/or MDs analyzed and calculations checked; applicable	TB	SB
RLVS analyzed	TB	SB
Preparation and analysis hold times met	TB	SB
Preparation deviations and re-preparations noted when performed	TB	SB
Analysis deviations and re-analyses noted when performed	TB	SB
Sample dilution factors noted on reports	TB	SB
Electronic records in HBN transcription accuracy and completeness	TB	SB
Preparation and analysis calculations checked	TB	SB
NCRs are completed as necessary NC/CAR# _____	TB	SB
Report forms are complete and accurate	TB	SB
Manual integrations checked	TB	SB



STANDARD REPORT

Working Standard - CLO4ISTDWRK

CLO4ISTDWRK		Description - Perchlorate ISTD Wrk 1,000ug/L			
Standard: 49946	Created By: Thomas Bosch	Amount: 25 mL			
MFG: ALS/SLC	Create Date: 09/23/2019 03:09PM	Expires: 09/19/2020			
MFG Lot: TNB: 09/20/2019	Verified By: Thomas Bosch	Usable: Yes			
Pipette ID: Not Provided	Verify Date:	Lab Lot: CLO4ISTDWRK			
Pos.	Analyte	Name	Concentration		
1	14797-73-0-8385	Perchlorate 83:85 Ratio	1000 ug/L		
2	14797-73-0-89	Perchlorate 89	1000 ug/L		
Composition					
Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
47863	CLO4ISTDSTK	Perchlorate ISTD Stock	CLO4ISTDSTK	0.25 mL	12/05/2028



STANDARD REPORT

Constituent

Stock Standard - CLO4ISTDSTK

CLO4ISTDSTK		Description - Perchlorate ISTD Stock	
Standard: 47863		Created By: Thomas Bosch	Amount: 1 mL
MFG: Cambridge Isotope		Create Date: 05/23/2019 10:05AM	Expires: 12/05/2028
MFG Lot: SDIH-016		Verified By: Thomas Bosch	Usable: Yes
Part ID: OLM-7310-S		Verify Date:	Lab Lot: CLO4ISTDSTK
Pos.	Analyte	Name	Concentration
1	14797-73-0-8385	Perchlorate 83:85 Ratio	100 ug/mL
2	14797-73-0-89	Perchlorate 89	100 ug/mL



STANDARD REPORT

Working Standard - CLO4 WRK

CLO4 WRK		Description - 6850 WKG Std 100.ug/L			
Standard: 49948		Created By: Thomas Bosch		Amount: 10 mL	
MFG: ALS/SLC		Create Date: 09/20/2019 03:09PM		Expires: 07/25/2020	
MFG Lot: TNB: 09/20/2019				Usable: Yes	
Pipette ID: Not Provided				Lab Lot: CLO4 WRK	
Pos.	Analyte	Name	Concentration		
1	14797-73-0	Perchlorate	0.1 ug/mL		
2	14797-73-0-8385	Perchlorate 83:85 Ratio	0.1 ug/mL		
Composition					
Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
49947	CLO4 INT	6850 Intermdt AccStd 10.ug/mL	CLO4 INT	0.1 mL	07/25/2020



STANDARD REPORT

Constituent

Stock Standard - CLO4 STOCK

CLO4 STOCK		Description - 6850 Stock AccStd 1,000ug/mL	
Standard: 43659		Created By: Thomas Bosch	
MFG: AccuStandard		Create Date: 09/17/2018 09:09AM	
MFG Lot: 218065075		Expires: 07/25/2020	
Part ID: IC-PER-10X-1		Usable: Yes	
		Lab Lot: CLO4 STOCK	
Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	1000 ug/mL
2	14797-73-0-8385	Perchlorate 83:85 Ratio	1000 ug/mL



STANDARD REPORT

Constituent

Solvent Standard - ASTM H2O

ASTM H2O		Description - ASTM Type II Water	
Standard: 109	Created By: ALS Support (Lims)	Amount: 1000 L	
MFG: DCL In House	Create Date: 10/06/2005 09:10AM	Expires: 11/07/2025	
MFG Lot: Not Provided		Usable: Yes	
Part ID: Not Provided		Lab Lot: LAB 109	
Pos.	Analyte	Name	Concentration
Solvent - Analyte(s) not applicable			



STANDARD REPORT

Constituent

Working Standard - CLO4 INT

CLO4 INT		Description - 6850 Intermdt AccStd 10.ug/mL			
Standard: 49947		Created By: Thomas Bosch		Amount: 10 mL	
MFG: ALS/SLC		Create Date: 09/23/2019 03:09PM		Expires: 07/25/2020	
MFG Lot: TNB: 09/20/2019				Usable: Yes	
Pipette ID: Not Provided				Lab Lot: CLO4 INT	
Pos.	Analyte	Name	Concentration		
1	14797-73-0	Perchlorate	10 ug/mL		
2	14797-73-0-8385	Perchlorate 83:85 Ratio	10 ug/mL		
Composition					
Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
43659	CLO4 STOCK	6850 Stock AccStd 1,000ug/mL	CLO4 STOCK	0.1 mL	07/25/2020



STANDARD REPORT

Working Standard - CLO4 QC WRK

CLO4 QC WRK		Description - 6850 QC WKG STD 100ug/L			
Standard: 47516		Created By: Thomas Bosch		Amount: 10 mL	
MFG: ALS/SLC		Create Date: 05/06/2019 03:05PM		Expires: 03/31/2020	
MFG Lot: TNB: 05/06/2019				Usable: Yes	
Pipette ID: Not Provided				Lab Lot: CLO4 QC WRK 100.ug/L	
Pos.	Analyte	Name	Concentration		
1	14797-73-0	Perchlorate	100 ug/L		
Composition					
Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
47515	CLO4 QC INT	6850 QC Intrmtd Std-QC 10ug/mL	CLO4 QC INT 10.ug/mL	0.1 mL	03/31/2020



STANDARD REPORT

Constituent

Solvent Standard - ASTM H2O

ASTM H2O		Description - ASTM Type II Water	
Standard: 109	Created By: ALS Support (Lims)	Amount: 1000 L	
MFG: DCL In House	Create Date: 10/06/2005 09:10AM	Expires: 11/07/2025	
MFG Lot: Not Provided		Usable: Yes	
Part ID: Not Provided		Lab Lot: LAB 109	
Pos.	Analyte	Name	Concentration
Solvent - Analyte(s) not applicable			



STANDARD REPORT

Constituent

Stock Standard - CLO4 QCSTOCK

CLO4 QCSTOCK		Description - 6850 QC Stock STD 1,000ug/mL	
Standard: 36748	Created By: Thomas Bosch	Amount: 100 mL	
MFG: Ultra Scientific	Create Date: 05/11/2017 01:05PM	Expires: 03/31/2020	
MFG Lot: CP-0860		Usable: Yes	
Part ID: ICC-013		Lab Lot: CLO4 QC STOCK	
Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	1000 ug/mL



STANDARD REPORT

Constituent

Working Standard - CLO4 QC INT

CLO4 QC INT		Description - 6850 QC Intrmdt Std-QC 10ug/mL			
Standard: 47515		Created By: Thomas Bosch		Amount: 10 mL	
MFG: ALS/SLC		Create Date: 05/06/2019 03:05PM		Expires: 03/31/2020	
MFG Lot: TNB: 05/06/2019				Usable: Yes	
Pipette ID: Not Provided				Lab Lot: CLO4 QC INT 10.ug/mL	
Pos.	Analyte	Name	Concentration		
1	14797-73-0	Perchlorate	10 ug/mL		
Composition					
Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
36748	CLO4 QCSTOCK	6850 QC Stock STD 1,000ug/mL	CLO4 QC STOCK	0.1 mL	03/31/2020

125 Market Street
New Haven, CT 06513
USA



AccuStandard®

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www.AccuStandard.com

CERTIFICATE OF ANALYSIS



S

43659

AccuTrace™ Reference Standard

Catalog No: IC-PER-10X-1
Description: Perchlorate Standard
Element: Perchlorate (ClO₄)
SRM: Ind. Std.
Lot: 218065075
Matrix: Water
Hazards: Refer to SDS for complete safety information

Date Certified: Jun 25, 2018
Expiration: Jul 25, 2020
Sample Size: 100 mL
Components: 1
Storage Condition: Ambient (>5 °C)
Included on ISO/IEC 17025 Scope of Accreditation: Yes
Included on ISO 17034 Scope of Accreditation: Yes



Signal Word: None

Component	SRM #	Prepared Concentration (µg/mL)
ClO ₄ Perchlorate	Ind. Std.	1000

The gravimetric uncertainty for this product is ±0.24%.

The final solution was checked against an independent standard to verify its concentration.

We use the highest purity raw materials available to minimize impurity levels in the final solution. Typically 99.999%+ pure starting materials are used as well as ASTM Type I 18 megohm deionized water.

All solutions are filtered through a 0.2 µm filter prior to being bottled.

All glassware used in preparation is Class A and calibrated regularly.

All weights are traceable through NIST; Test No. 822-275872-11

All bottles are triple rinsed with deionized water prior to use.

Shake bottle prior to use and do not pipette directly out of the bottle. Use only cleaned Class A volumetric glassware.

We certify the accuracy of this standard to be ±0.5% of the stated value until its expiration date provided it is kept tightly capped and stored under the conditions stated above.

Certified By:

Meigan O'Leary

Meigan O'Leary, Inorganic QC Manager

Page 1 of 1

For use in routine laboratory analysis.

AccuStandard is accredited to ISO 17034, ISO/IEC 17025 and certified to ISO 9001:2015

QR-ORG/INO-001
Rev. 5/18



Certificate of Analysis



ISO Guide 34 Reference Material

Product Number: ICC-013
Lot Number: CP-0860



Lot Issue Date: 29-Feb 2016
Expiration Date: 31-Mar 2020

Product Name: Perchlorate IC Standard

Description:

This Reference Material (RM) was gravimetrically prepared in accordance with ISO Guide 34 and under ULTRA Scientific's ISO 9001 registered quality system. The neat materials used for this product have been verified by ULTRA's ISO 17025 laboratory and under ULTRA's ISO Guide 34 accreditation. The analyte concentrations were verified by ULTRA's ISO 17025 accredited laboratory. For each analyte, the true value, with its uncertainty value calculated at the 95% confidence level, is reported below.

Analyte	Starting Material	Lot Number	Purity (%)	Calculated Value	True Value	Traceability & Method
perchlorate	potassium perchlorate	RM07987	100	1001 ± 5 µg/mL	976 ± 6 µg/mL	NIST SRM 3141A; ICP-OES

Solvent: water (low TOC, < 50 ppb)

Storage: Store at Room Temperature (15° to 30°C).

Traceability:

Traceability has been established through an unbroken chain of comparisons, each having stated uncertainties. Comparisons are based on appropriate physical or chemical measurements, including gravimetric or volumetric dilution, where the mass or volume of a solution before and after dilution is measured. The balances used for these measurements are calibrated with weights traceable to NIST in compliance with ANSI/NCCL Z-540-1, ISO 9001, ISO 17025, and ISO Guide 34. Calibrated Class A glassware is used for volumetric measurements. Thermometers are calibrated against a NIST traceable thermometer in accordance with NIST Special Publication 819.

Estimation of Uncertainties:

The true value is reported, with its uncertainty value calculated at the 95% confidence level.

Homogeneity:

This RM was formulated and unitized according to an in-house procedure and is guaranteed to be homogeneous. There is no minimum sub-sample size required.

Intended Use:

This RM is intended for the preparation of working reference samples for use in routine laboratory analyses, calibration of instruments, validation of analytical methods, assessments of measurement methods and continuing calibration verification.

Instructions for Use:

Sample aliquots for analysis should be withdrawn at 20°C to 25°C immediately after opening and should be processed without delay for the true value to be valid within the stated uncertainties. Do not pipet from the bottle. Do not return any material removed for pipetting to the bottle. Tightly cap the bottle after removing any material and store according to the instructions noted above.

Hazards:

Refer to the Safety Data Sheet for information regarding this RM.

Expiration of Certification:

The certification of this RM is valid, within the measurement uncertainty specified, until the expiration date specified above, provided the RM is handled and stored in accordance with the instructions given in this certificate. This certification is nullified if the RM is damaged, contaminated, or otherwise modified.



ISO 9001 Registered Quality System – TUV USA

Page 1 of 2



Certificate of Analysis



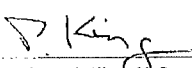
ISO Guide 34 Reference Material

Product Number: ICC-013
Lot Number: CP-0860

Lot Issue Date: 29-Feb 2016
Expiration Date: 31-Mar 2020

Maintenance of Certification:

The real-time, long term stability of the RM may be monitored over the lifetime of the certification. If substantive changes occur that affect the certification before the expiration of this certificate, ULTRA Scientific will notify the purchaser.


Peter A. King, Ph.D.
VP, Technical Operations


Daniel J. Lamendola
Director of QA/RA



ISO 9001 Registered Quality System – TUV USA

Page 2 of 2



Cambridge Isotope Laboratories, Inc.

Certificate of Analysis



Product Name: PERCHLORIC ACID, SODIUM SALT
(Isotopic Label & Enrichment Specification) (18O4, 90%+) 100 UG/ML IN WATER

Lot Number: SDIH-016

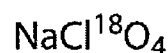
Catalog Number: OLM-7310-S

Product Information

Chemical Purity Specification: $\geq 98\%$

MW*: 130.44
* For isotopically labeled compounds, MW listed is for the fully enriched product.

Labeled CAS Number: NA



Unlabeled CAS Number: 7601-89-0

Chemical Formula: $\text{NaCl} \cdot \text{O}_4$

Storage: Store at room temperature away from light and moisture.

Stability: See storage and expiration date.

Certification

Cambridge Isotope Laboratories, Inc. guarantees that this material meets or exceeds the specifications stated. Absolute identity as well as chemical and isotopic purities are assured by the use of unambiguous synthetic routes and multiple chemical analyses whenever possible. Results are representative of QC testing at time of release from Quality Control unless otherwise stated. CIL Certificates of Analysis are occasionally updated with new data following recertification. We recommend checking the website for the latest version.

Volumetric measurements were made with Class A glassware. Gravimetry is traceable to the NIST through calibrated balances and certified, calibrated, standard weights. The calibrations are traceable to the NIST under Test No. 822/270236-04. The calibrations also meet specifications outlined in ISO 9001, ISO/IEC 17025, ANSI/NSCL Z540-1-1994, NCR Document 10CFR50 Appendix B, and applicable subdocuments.

This COA references the bulk catalog number before packaging. The COA also applies to the CIL finished good catalog number. Some possible packaging sizes and their corresponding suffix are -1.2, -1, -0.5, -10, or -0.1.

Approved by: Sashi Sivendran-Basak

Sashi Sivendran-Basak, Ph.D., Quality Review

Quality Control Tests and Results

QC Release Date	12/05/2018
Expiration Date	12/05/2028
Concentration Based on Gravimetry	100.0 \pm 1.0 $\mu\text{g/mL}$ (k=2)
Chemical Purity of Neat Material(s)	98%
LC/MS for Concentration	105.4 \pm 1.1 $\mu\text{g/mL}$ (k=2)

CIL subscribes to the following standards for different products: ISO Guide 34, ISO/IEC 17025, ISO 13485 and cGMP as appropriate.



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Batch Report: C:\HPCHEM\1\DATA\19DEC19D\19DEC19S.B

Batch Review Method:

C:\HPCHEM\1\METHODS\CLO4-DP3.M

['#' ==> Run has not been reprocessed with Batch Review Method

['*' ==> Run has been saved with batch file]

#*	Sample	Location	Inj	SampleType	Run	Perchlorate Area	Perchlorat RT	Perchlorate Amount
*	689011	CCV@25	Vial 71	1	Control	1.87707e6	7.381	26.14581
*	689012	QC@3.0	Vial 72	1	Control	2.23679e5	7.363	3.17413
*	689014	ICS@3.0	Vial 73	1	Control	1.39512e5	7.308	2.74403
*	689015	LMB	Vial 74	1	Control	0.00000	0.000	0.00000
*	1934606001		Vial 75	1	Sample	0.00000	0.000	0.00000
*	689016	346061S	Vial 76	1	Sample	2.07557e5	7.557	2.60372
*	689017	346061D	Vial 77	1	Sample	2.22311e5	7.532	3.05615
*	1934606002		Vial 78	1	Sample	0.00000	0.000	0.00000
*	1934606003		Vial 79	1	Sample	0.00000	0.000	0.00000
*	1934606004		Vial 80	1	Sample	2.15150e6	7.296	32.85408
*	1934606005	100	Vial 81	1	Sample	3.24098e6	7.612	40.73782
*	1934606007		Vial 83	1	Sample	0.00000	0.000	0.00000
*	1934606008		Vial 84	1	Sample	0.00000	0.000	0.00000
*	689018	CCV@25	Vial 71	1	Control	1.97491e6	7.498	26.84273
*	1934611001		Vial 85	1	Sample	0.00000	0.000	0.00000
*	1934611002		Vial 86	1	Sample	4.58136e4	7.317	6.29137e-1
*	1934611003	1K	Vial 87	1	Sample	2.02988e6	7.589	2.47014e4
*	1934611004		Vial 88	1	Sample	0.00000	0.000	0.00000
*	1934611005		Vial 89	1	Sample	8.68103e5	7.335	9.97234
*	1934611006	1K	Vial 90	1	Sample	7.48762e6	7.548	7.44953e4
*	1934606006	10X	Vial 91	1	Sample	2.37533e6	7.561	316.86173
*	689019	CCV@25	Vial 71	1	Control	1.91696e6	7.460	27.03293

#*	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
*	689011	CCV@25	Vial 71	1	Control	2.44153e5	7.402	5.00000
*	689012	QC@3.0	Vial 72	1	Control	2.59466e5	7.387	5.00000
*	689014	ICS@3.0	Vial 73	1	Control	1.86819e5	7.320	5.00000
*	689015	LMB	Vial 74	1	Control	2.69339e5	7.513	5.00000
*	1934606001		Vial 75	1	Sample	2.65224e5	7.587	5.00000
*	689016	346061S	Vial 76	1	Sample	2.92640e5	7.567	5.00000
*	689017	346061D	Vial 77	1	Sample	2.67715e5	7.554	5.00000
*	1934606002		Vial 78	1	Sample	2.76931e5	7.411	5.00000
*	1934606003		Vial 79	1	Sample	3.05391e5	7.433	5.00000
*	1934606004		Vial 80	1	Sample	2.16695e5	7.316	5.00000
*	1934606005	100	Vial 81	1	Sample	2.55099e5	7.633	5.00000
*	1934606007		Vial 83	1	Sample	2.28101e5	7.450	5.00000
*	1934606008		Vial 84	1	Sample	2.11488e5	7.405	5.00000
*	689018	CCV@25	Vial 71	1	Control	2.49495e5	7.517	5.00000
*	1934611001		Vial 85	1	Sample	1.86290e5	7.300	5.00000
*	1934611002		Vial 86	1	Sample	2.45674e5	7.373	5.00000
*	1934611003	1K	Vial 87	1	Sample	2.81136e5	7.609	5000.00000
*	1934611004		Vial 88	1	Sample	2.29273e5	7.333	5.00000
*	1934611005		Vial 89	1	Sample	3.16178e5	7.352	5.00000
*	1934611006	1K	Vial 90	1	Sample	2.84296e5	7.567	5000.00000
*	1934606006	10X	Vial 91	1	Sample	2.49233e5	7.576	50.00000
*	689019	CCV@25	Vial 71	1	Control	2.40281e5	7.484	5.00000

#*	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
*	689011	CCV@25	Vial 71	1	Control	5.58720e5	7.396	25.58644
*	689012	QC@3.0	Vial 72	1	Control	7.24513e4	7.384	3.28175
*	689014	ICS@3.0	Vial 73	1	Control	5.46756e4	7.315	3.44509
*	689015	LMB	Vial 74	1	Control	0.00000	0.000	0.00000

Batch Report: C:\HPCHEM\1\DATA\19DEC19D\19DEC19S.B

#*	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
*	1934606001	Vial 75	1	Sample	5	0.00000	0.000	0.00000
*	689016 346061S	Vial 76	1	Sample	6	6.82779e4	7.552	2.72168
*	689017 346061D	Vial 77	1	Sample	7	7.21608e4	7.553	3.16378
*	1934606002	Vial 78	1	Sample	8	0.00000	0.000	0.00000
*	1934606003	Vial 79	1	Sample	9	0.00000	0.000	0.00000
*	1934606004	Vial 80	1	Sample	10	7.41292e5	7.308	36.69916
*	1934606005 100	Vial 81	1	Sample	11	9.49000e5	7.625	39.49983
*	1934606007	Vial 83	1	Sample	13	0.00000	0.000	0.00000
*	1934606008	Vial 84	1	Sample	14	0.00000	0.000	0.00000
*	689018 CCV@25	Vial 71	1	Control	15	5.86422e5	7.511	26.21822
*	1934611001	Vial 85	1	Sample	16	0.00000	0.000	0.00000
*	1934611002	Vial 86	1	Sample	17	1.75358e4	7.393	7.24326e-1
*	1934611003 1K	Vial 87	1	Sample	18	6.01145e5	7.606	2.40455e4
*	1934611004	Vial 88	1	Sample	19	0.00000	0.000	0.00000
*	1934611005	Vial 89	1	Sample	20	2.78309e5	7.339	10.37790
*	1934611006 1K	Vial 90	1	Sample	21	2.22112e6	7.562	7.36292e4
*	1934606006 10X	Vial 91	1	Sample	22	7.03769e5	7.573	309.46591
*	689019 CCV@25	Vial 71	1	Control	23	5.62100e5	7.476	26.10541

*** End of Report ***

Sequence: C:\HPCHEM\1\SEQUENCE\CLO4\2019\DEC\19DEC19D.S

Sequence Table:

Method and Injection Info Part:

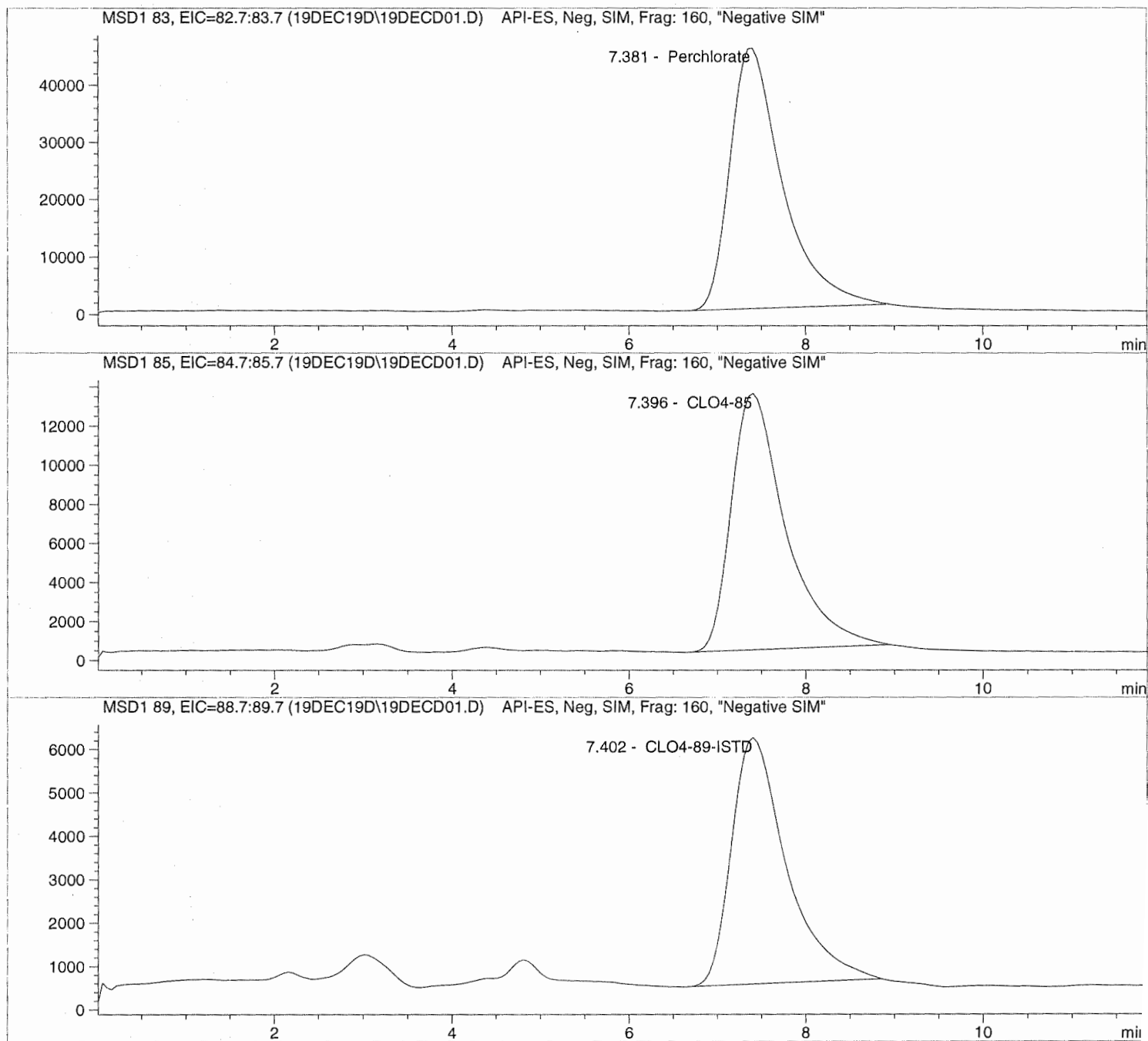
Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
====	=====	=====	=====	===	=====	=====	=====
1	Vial 71	689011	CCV@25	CLO4-AQN	1		Ctrl Samp
2	Vial 72	689012	QC@3.0	CLO4-AQN	1		Ctrl Samp
3	Vial 73	689014	ICS@3.0	CLO4-AQN	1		Ctrl Samp
4	Vial 74	689015	LMB	CLO4-AQN	1		Ctrl Samp
5	Vial 75	1934606001		CLO4-AQN	1		Sample
6	Vial 76	689016	346061S	CLO4-AQN	1		Sample
7	Vial 77	689017	346061D	CLO4-AQN	1		Sample
8	Vial 78	1934606002		CLO4-AQN	1		Sample
9	Vial 79	1934606003		CLO4-AQN	1		Sample
10	Vial 80	1934606004		CLO4-AQN	1		Sample
11	Vial 81	1934606005	100	CLO4-AQN	1		Sample
12	Vial 82	1934606006	100	CLO4-AQN	1		Sample
13	Vial 83	1934606007		CLO4-AQN	1		Sample
14	Vial 84	1934606008		CLO4-AQN	1		Sample
15	Vial 71	689018	CCV@25	CLO4-AQN	1		Ctrl Samp
16	Vial 85	1934611001		CLO4-AQN	1		Sample
17	Vial 86	1934611002		CLO4-AQN	1		Sample
18	Vial 87	1934611003	1K	CLO4-AQN	1		Sample
19	Vial 88	1934611004		CLO4-AQN	1		Sample
20	Vial 89	1934611005		CLO4-AQN	1		Sample
21	Vial 90	1934611006	1K	CLO4-AQN	1		Sample
22	Vial 91	1934606006	10X	CLO4-AQN	1		Sample
23	Vial 71	689019	CCV@25	CLO4-AQN	1		Ctrl Samp

Data file: C:\HPCHEM\1\DATA\19DEC19D\19DEC19D01.D Sample Name: 689011 CCV@25

Injection Date: 12/19/2019 08:48:17 Seq Line: 1
Sample Name: 689011 CCV@25 Location: Vial 71
Acq Operator: TNB Inj. No.: 1
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19DEC19D\19DECD01.D Sample Name: 689011 CCV@25

```

=====
Injection Date: 12/19/2019 08:48:17      Seq Line: 1
Sample Name: 689011 CCV@25              Location: Vial 71
Acq Operator: TNB                        Inj. No.: 1
                                           Inj. Vol.: 35 µl
=====

```

```

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45
=====

```

Perchlorate analysis

Sample Information

```

=====
Sorted By: Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 25.000
=====

```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.381	PBA	1877068.4	26.1458	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.396	PBA	558719.6	25.5864	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.402	PBA	244152.9	5.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19DEC19D\19DECD02.D

Sample Name: 689012 QC@3.0

Injection Date: 12/19/2019 09:04:49

Seq Line: 2

Sample Name: 689012 QC@3.0

Location: Vial 72

Acq Operator: TNB

Inj. No.: 1

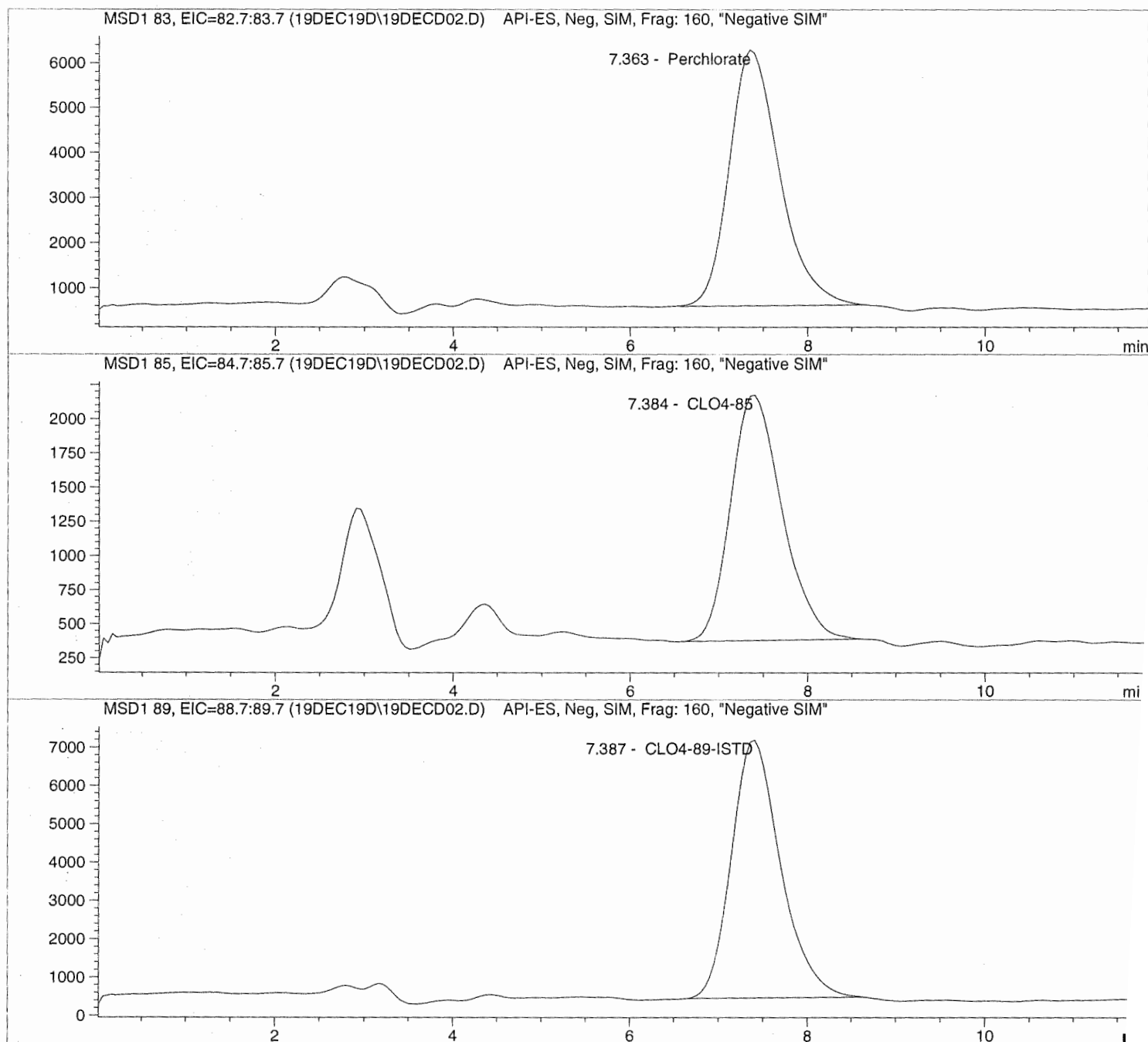
Inj. Vol.: 35 μ l

Acq. Method: CLO4-AQN.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M

Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19DEC19D\19DECD02.D Sample Name: 689012 QC@3.0

```

=====
Injection Date: 12/19/2019 09:04:49      Seq Line: 2
Sample Name: 689012 QC@3.0              Location: Vial 72
Acq Operator: TNB                        Inj. No.: 1
                                           Inj. Vol.: 35 µl
=====

```

```

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45
=====

```

Perchlorate analysis

Sample Information

```

=====
Sorted By: Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 3.000
=====

```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.363	BBA	223679.3	3.1741	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.384	PBA	72451.3	3.2817	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.387	BBA	259465.8	5.0000	CLO4-89-ISTD

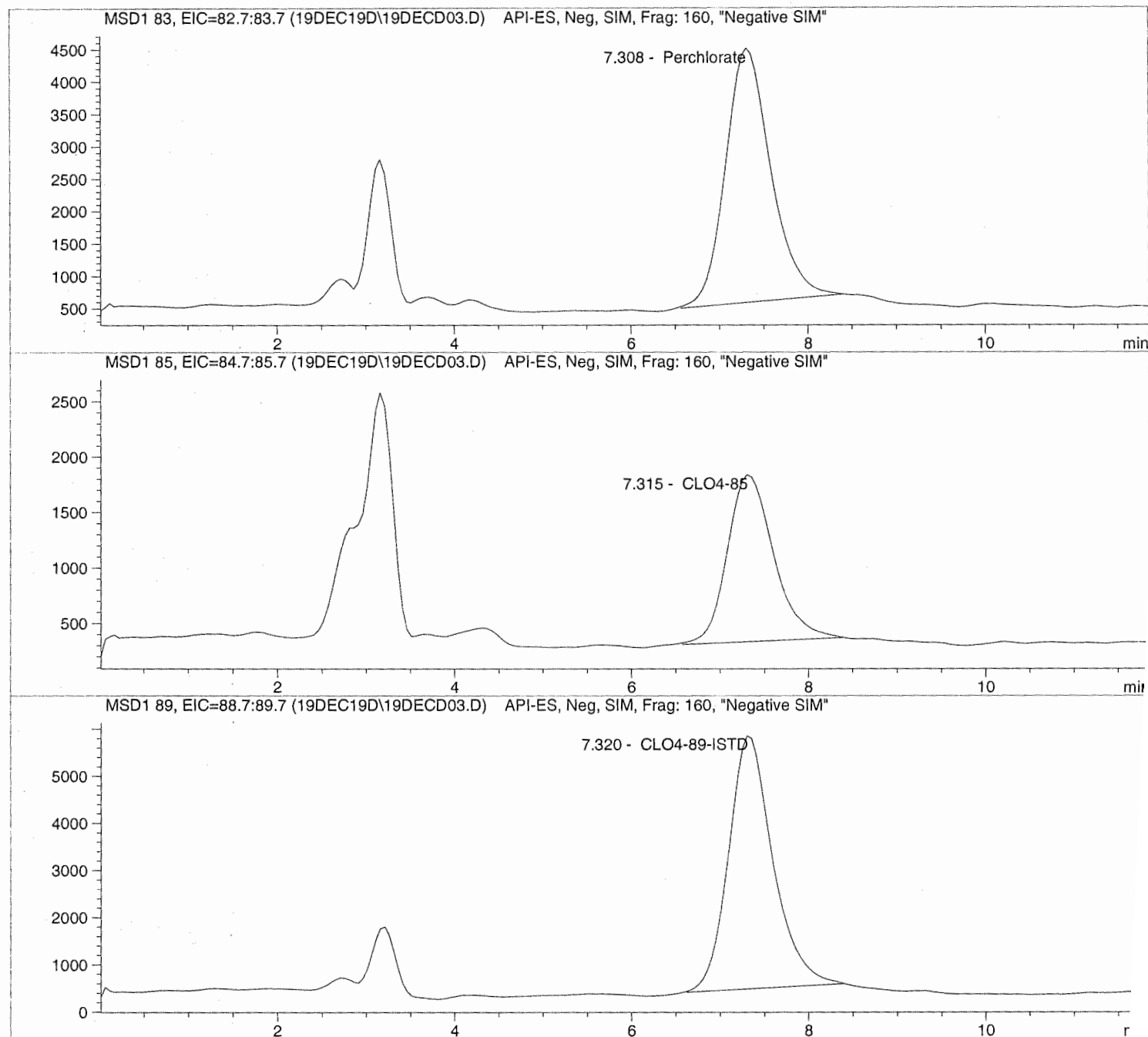
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19DEC19D\19DECD03.D Sample Name: 689014 ICS@3.0

=====
Injection Date: 12/19/2019 09:18:39 Seq Line: 3
Sample Name: 689014 ICS@3.0 Location: Vial 73
Acq Operator: TNB Inj. No.: 1
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19DEC19D\19DECD03.D Sample Name: 689014 ICS@3.0

```

=====
Injection Date: 12/19/2019 09:18:39      Seq Line:          3
Sample Name:   689014 ICS@3.0           Location:         Vial 73
Acq Operator:  TNB                      Inj. No.:        1
                                           Inj. Vol.:       35 µl
=====

```

```

Acq. Method:   CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:  11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  3.000
=====

```

```

=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.308	PBA	139511.6	2.7440	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.315	BBA	54675.6	3.4451	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.320	BBA	186819.2	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

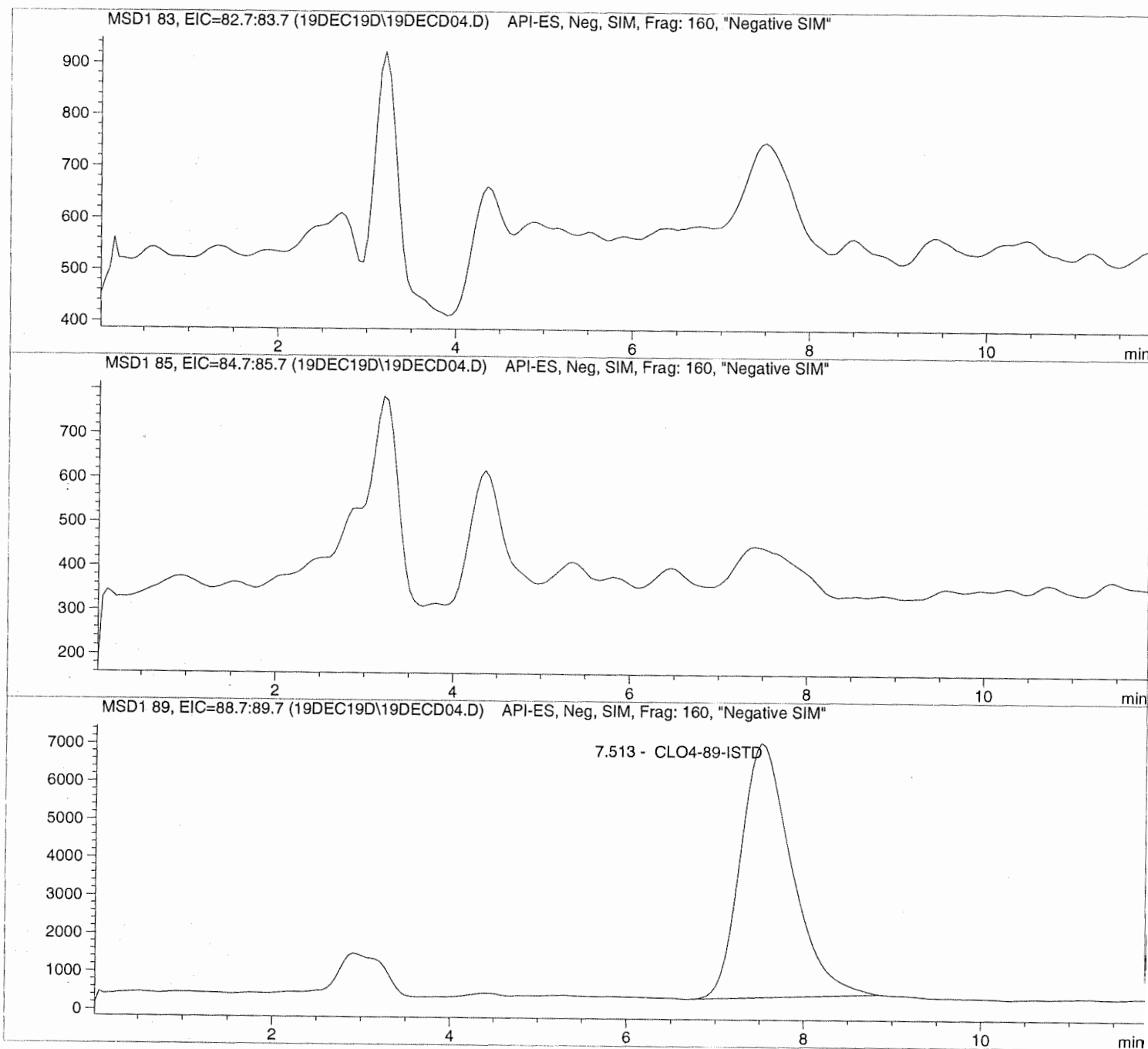
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Data file: C:\HPCHEM\1\DATA\19DEC19D\19DECD04.D Sample Name: 689015 LMB

=====
Injection Date: 12/19/2019 09:32:36 Seq Line: 4
Sample Name: 689015 LMB Location: Vial 74
Acq Operator: TNB Inj. No.: 1
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis
=====



Data file: C:\HPCHEM\1\DATA\19DEC19D\19DECD04.D Sample Name: 689015 LMB

```

=====
Injection Date: 12/19/2019 09:32:36      Seq Line:           4
Sample Name:   689015 LMB                Location:           Vial 74
Acq Operator:  TNB                      Inj. No.:          1
                                           Inj. Vol.:         35 µl
    
```

```

Acq. Method:   CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:  11/5/2019 08:44:45
    
```

Perchlorate analysis

Sample Information

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  0.000
    
```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.513	PBA	269339.2	5.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19DEC19D\19DECD05.D

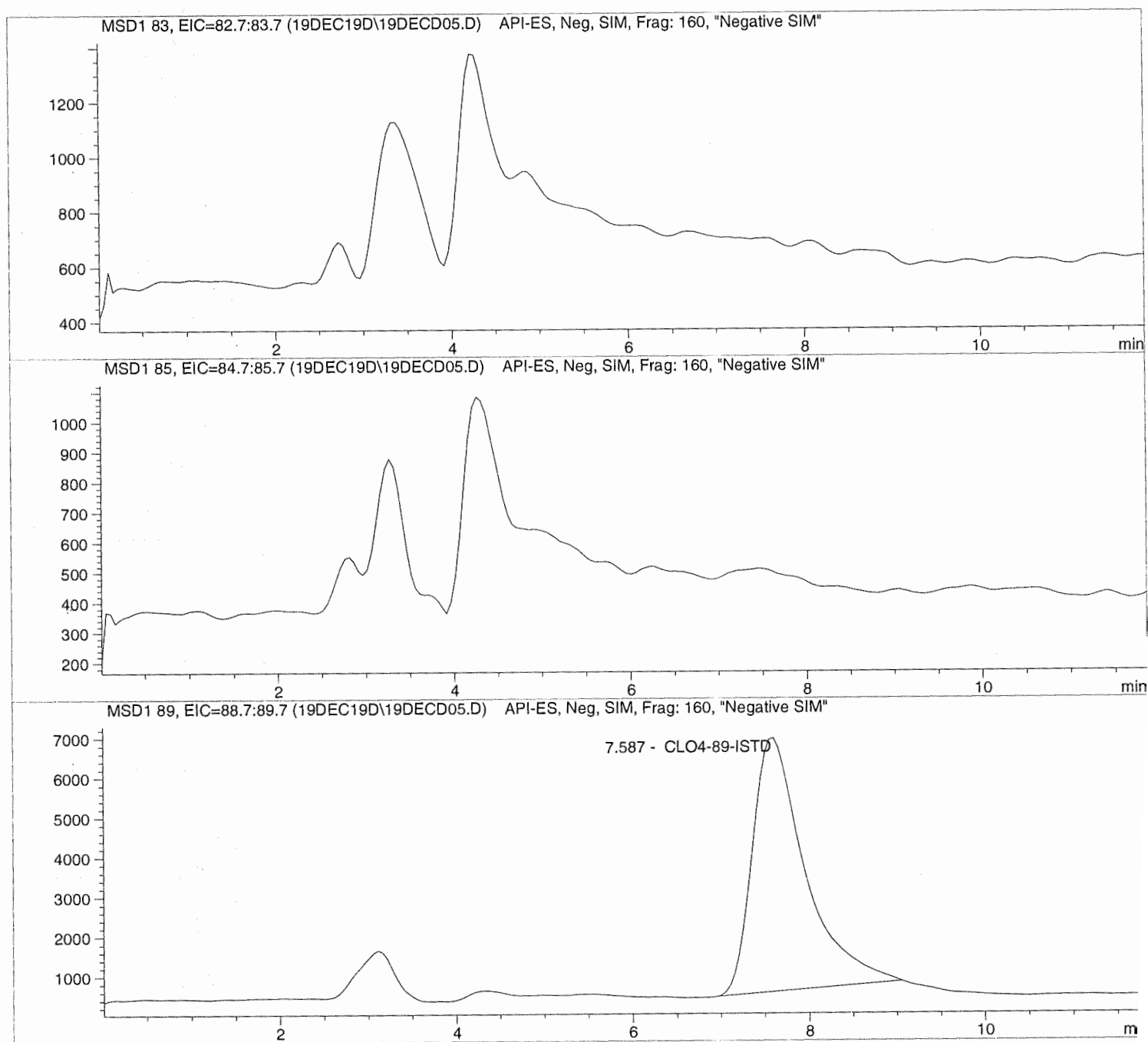
Sample Name: 1934606001

=====
Injection Date: 12/19/2019 09:46:27
Sample Name: 1934606001
Acq Operator: TNB

Seq Line: 5
Location: Vial 75
Inj. No.: 1
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19DEC19D\19DEC05.D

Sample Name: 1934606001

```

=====
Injection Date: 12/19/2019 09:46:27      Seq Line: 5
Sample Name: 1934606001                  Location: Vial 75
Acq Operator: TNB                        Inj. No.: 1
                                           Inj. Vol.: 35 µl
=====

```

```

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By: Signal
Calib. Data Modified: Mon, 23. Sep. 2019, 00:20:59 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 0.000
=====

```

```

=====
                          LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.587	PBA	265223.7	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

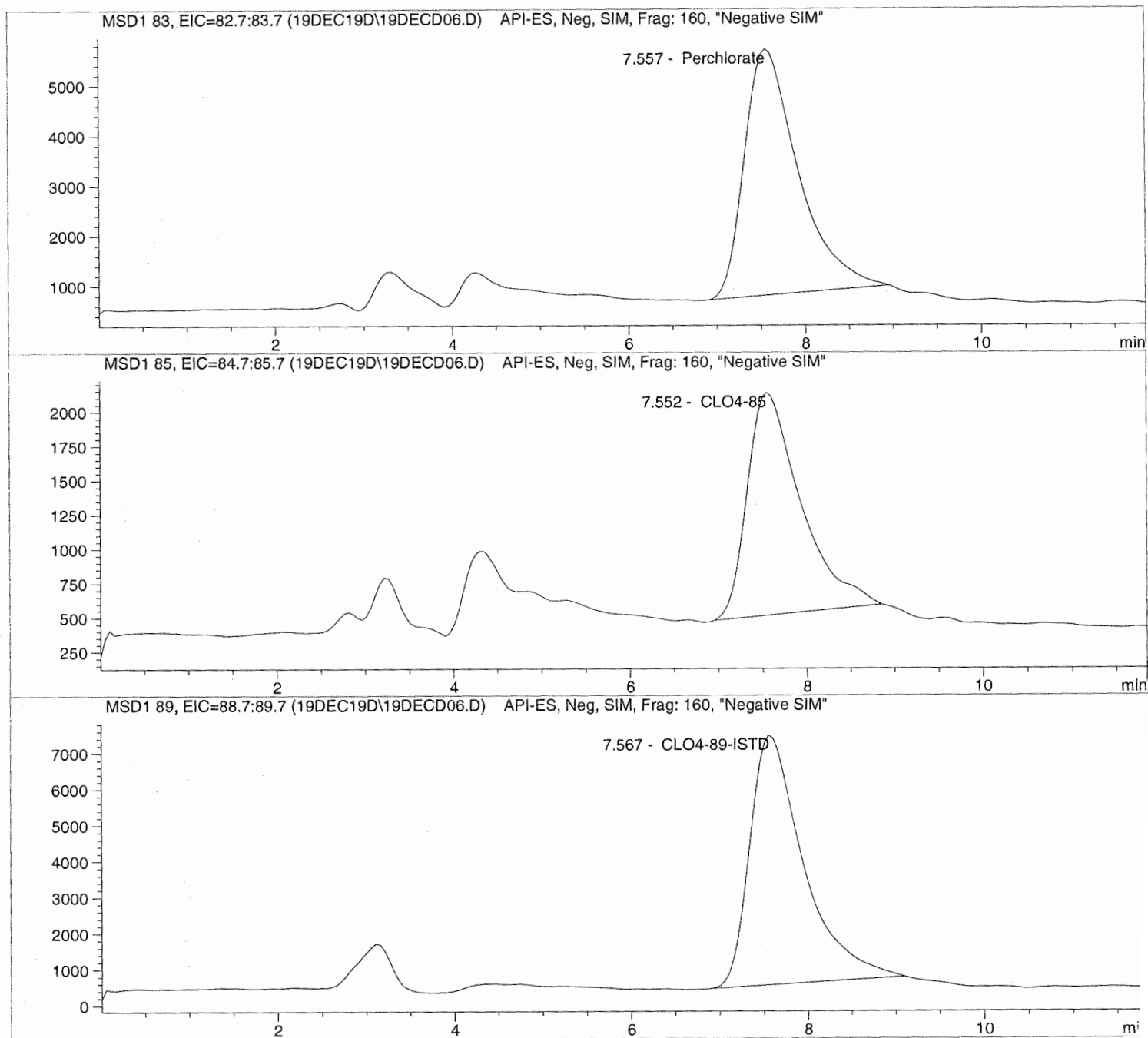
```

Data file: C:\HPCHEM\1\DATA\19DEC19D\19DECD06.D Sample Name: 689016 346061S

Injection Date: 12/19/2019 10:00:23 Seq Line: 6
Sample Name: 689016 346061S Location: Vial 76
Acq Operator: TNB Inj. No.: 1
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19DEC19D\19DEC06.D Sample Name: 689016 346061S

```

=====
Injection Date: 12/19/2019 10:00:23      Seq Line:          6
Sample Name:   689016 346061S           Location:         Vial 76
Acq Operator:  TNB                      Inj. No.:        1
                                           Inj. Vol.:       35 µl
  
```

```

Acq. Method:   CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:  11/5/2019 08:44:45
  
```

Perchlorate analysis

Sample Information

```

=====
Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:    1.000000
Dilution:      1.000000
Sample Amount: 0.000
  
```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.557	PBA	207557.0	2.6037	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.552	PBA	68277.9	2.7217	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.567	PBA	292639.9	5.0000	CLO4-89-ISTD

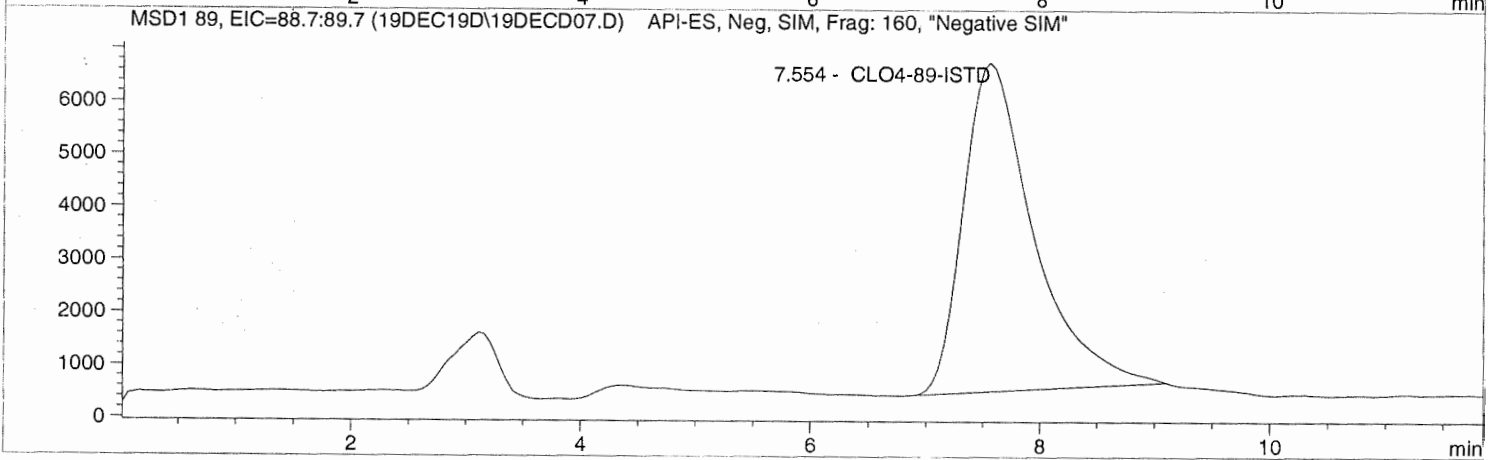
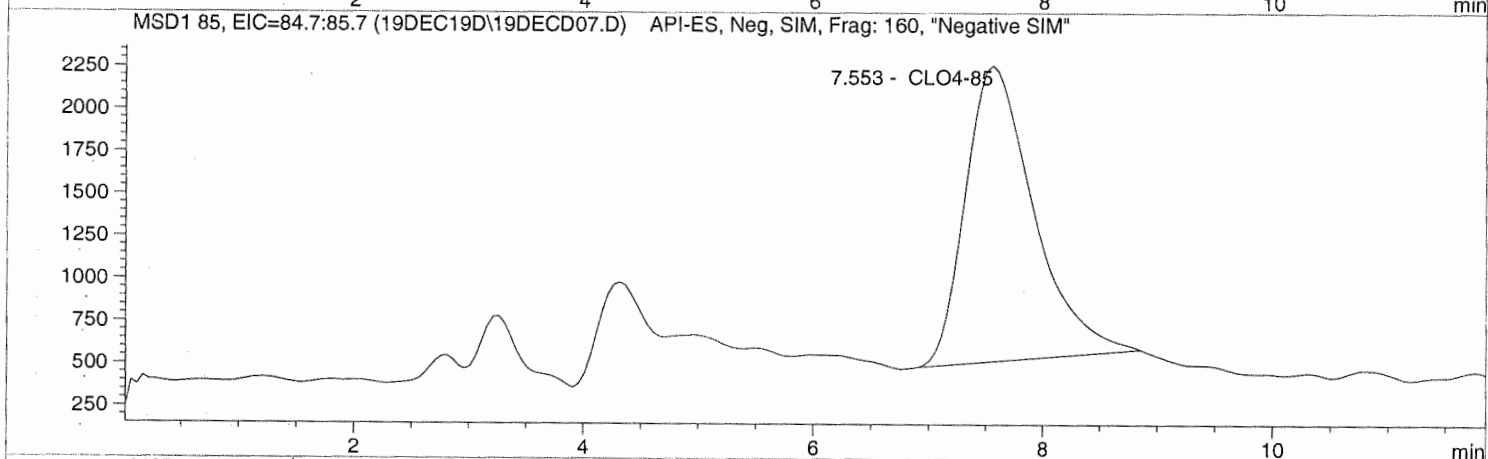
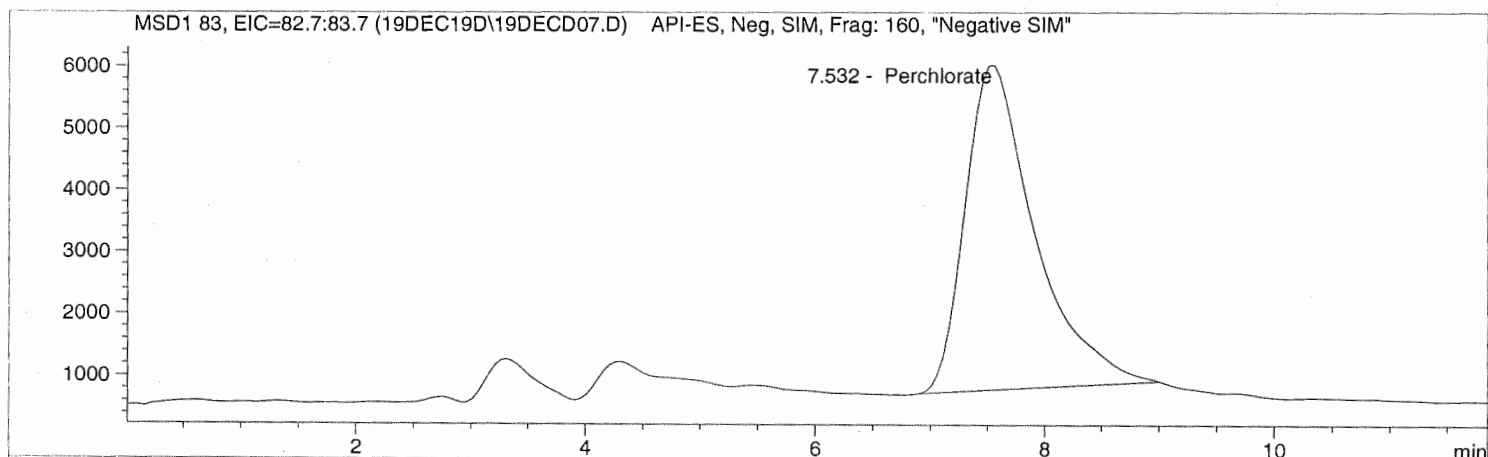
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19DEC19D\19DECD07.D Sample Name: 689017 346061D

=====
Injection Date: 12/19/2019 10:14:15 Seq Line: 7
Sample Name: 689017 346061D Location: Vial 77
Acq Operator: TNB Inj. No.: 1
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis
=====



Data file: C:\HPCHEM\1\DATA\19DEC19D\19DEC07.D Sample Name: 689017 346061D

Injection Date: 12/19/2019 10:14:15 Seq Line: 7
 Sample Name: 689017 346061D Location: Vial 77
 Acq Operator: TNB Inj. No.: 1
 Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M
 Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
 Last Changed: 11/5/2019 08:44:45

Perchlorate analysis

Sample Information

Sorted By: Signal
 Calib. Data Modified: Mon, 23. Sep. 2019, 00:20:59 pm
 Multiplier: 1.000000
 Dilution: 1.000000
 Sample Amount: 0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.532	PBA	222311.3	3.0561	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.553	PBA	72160.8	3.1638	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.554	PBA	267715.4	5.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19DEC19D\19DECD08.D

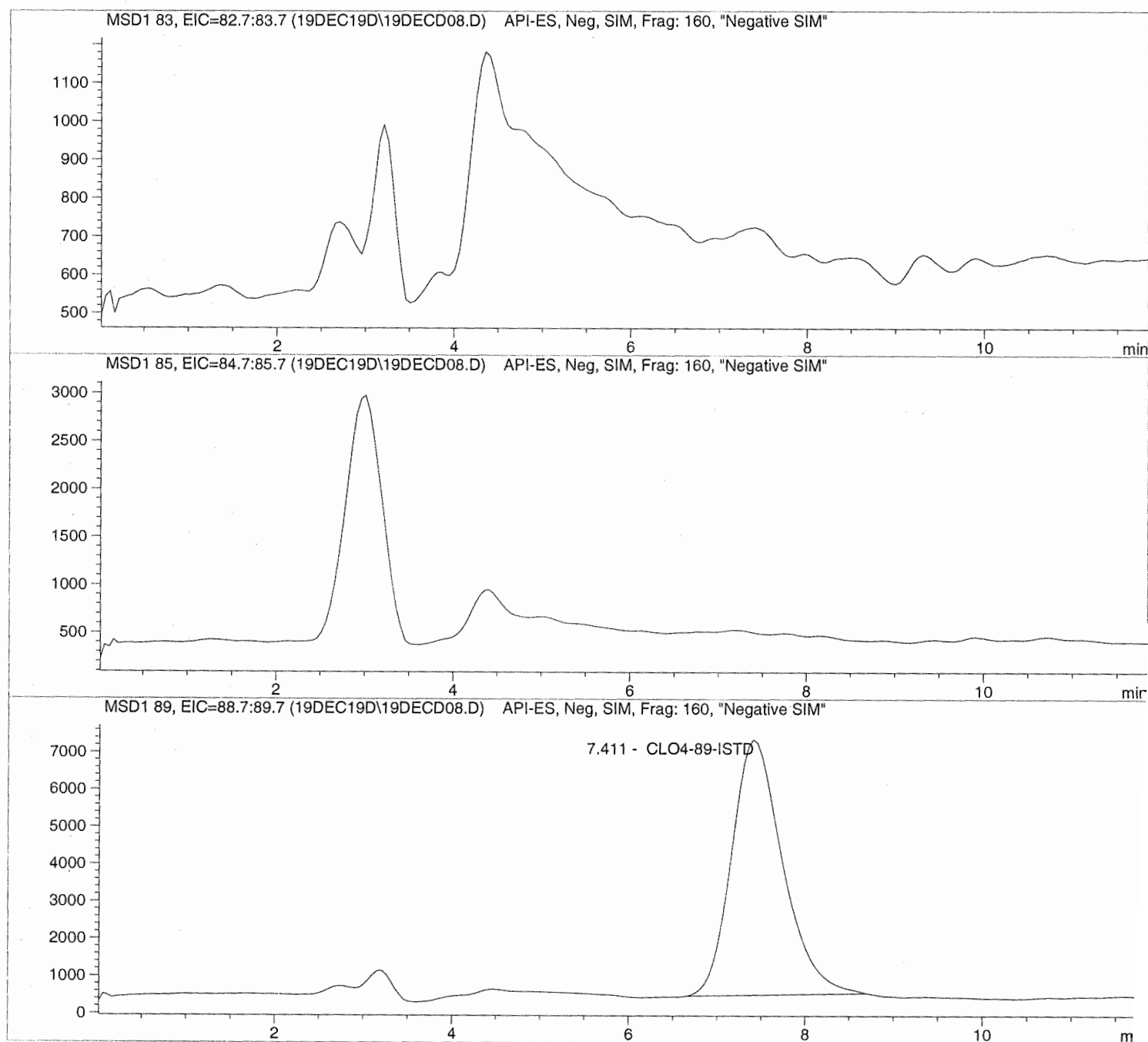
Sample Name: 1934606002

Injection Date: 12/19/2019 10:28:07
Sample Name: 1934606002
Acq Operator: TNB

Seq Line: 8
Location: Vial 78
Inj. No.: 1
Inj. Vol.: 35 μ l

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19DEC19D\19DEC08.D

Sample Name: 1934606002

```

=====
Injection Date: 12/19/2019 10:28:07      Seq Line:      8
Sample Name:   1934606002                 Location:      Vial 78
Acq Operator:  TNB                        Inj. No.:     1
                                           Inj. Vol.:    35 µl
=====

```

```

Acq. Method:   CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:  11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:    1.000000
Dilution:      1.000000
Sample Amount: 0.000
=====

```

```

=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.411	PBA	276930.6	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\19DEC19D\19DECD09.D

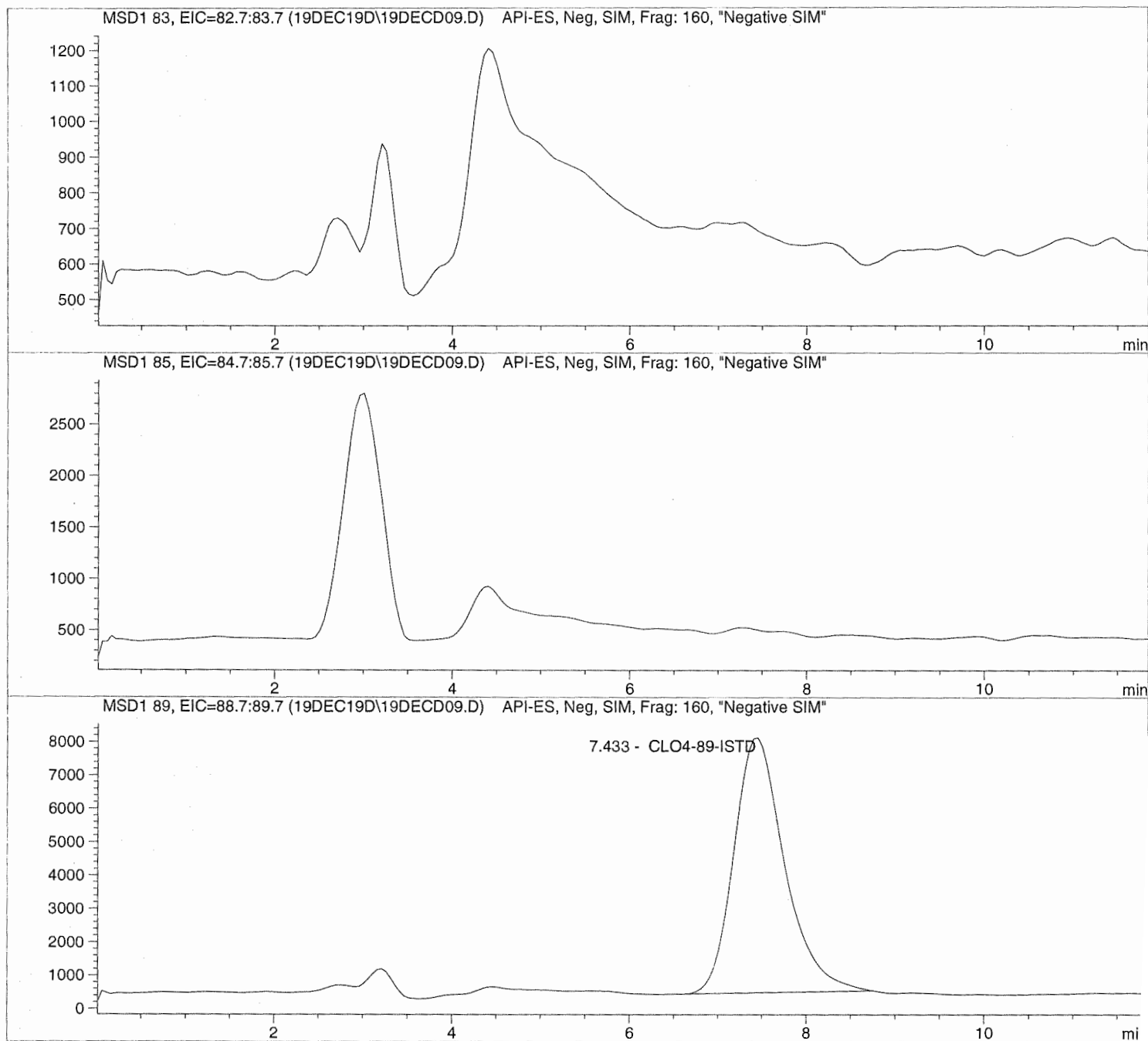
Sample Name: 1934606003

Injection Date: 12/19/2019 10:42:00
Sample Name: 1934606003
Acq Operator: TNB

Seq Line: 9
Location: Vial 79
Inj. No.: 1
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19DEC19D\19DECD09.D

Sample Name: 1934606003

```

=====
Injection Date: 12/19/2019 10:42:00      Seq Line:          9
Sample Name:    1934606003                Location:         Vial 79
Acq Operator:   TNB                       Inj. No.:        1
                                           Inj. Vol.:      35 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  0.000
=====

```

```

=====
                          LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.433	PBA	305391.4	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\19DEC19D\19DECD10.D

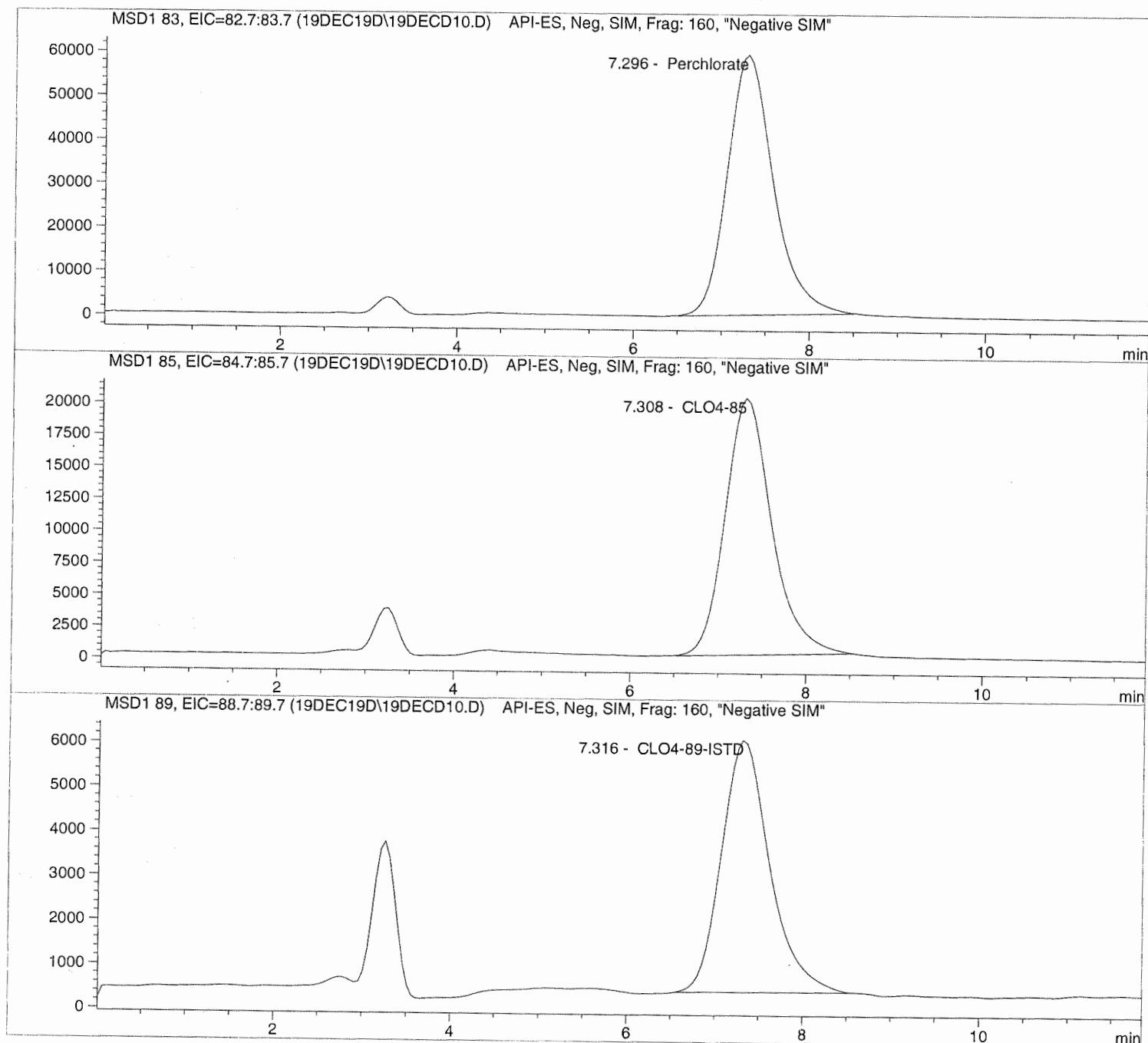
Sample Name: 1934606004

Injection Date: 12/19/2019 10:55:56
Sample Name: 1934606004
Acq Operator: TNB

Seq Line: 10
Location: Vial 80
Inj. No.: 1
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19DEC19D\19DECD10.D

Sample Name: 1934606004

```

=====
Injection Date: 12/19/2019 10:55:56      Seq Line:          10
Sample Name:   1934606004                Location:          Vial 80
Acq Operator:  TNB                       Inj. No.:         1
                                           Inj. Vol.:        35 µl

```

```

Acq. Method:   CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:  11/5/2019 08:44:45

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:          Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:        1.000000
Dilution:          1.000000
Sample Amount:     0.000

```

```

=====
                          LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.296	PBA	2151495.3	32.8541	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.308	PBA	741292.4	36.6992	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.316	PBA	216694.7	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***

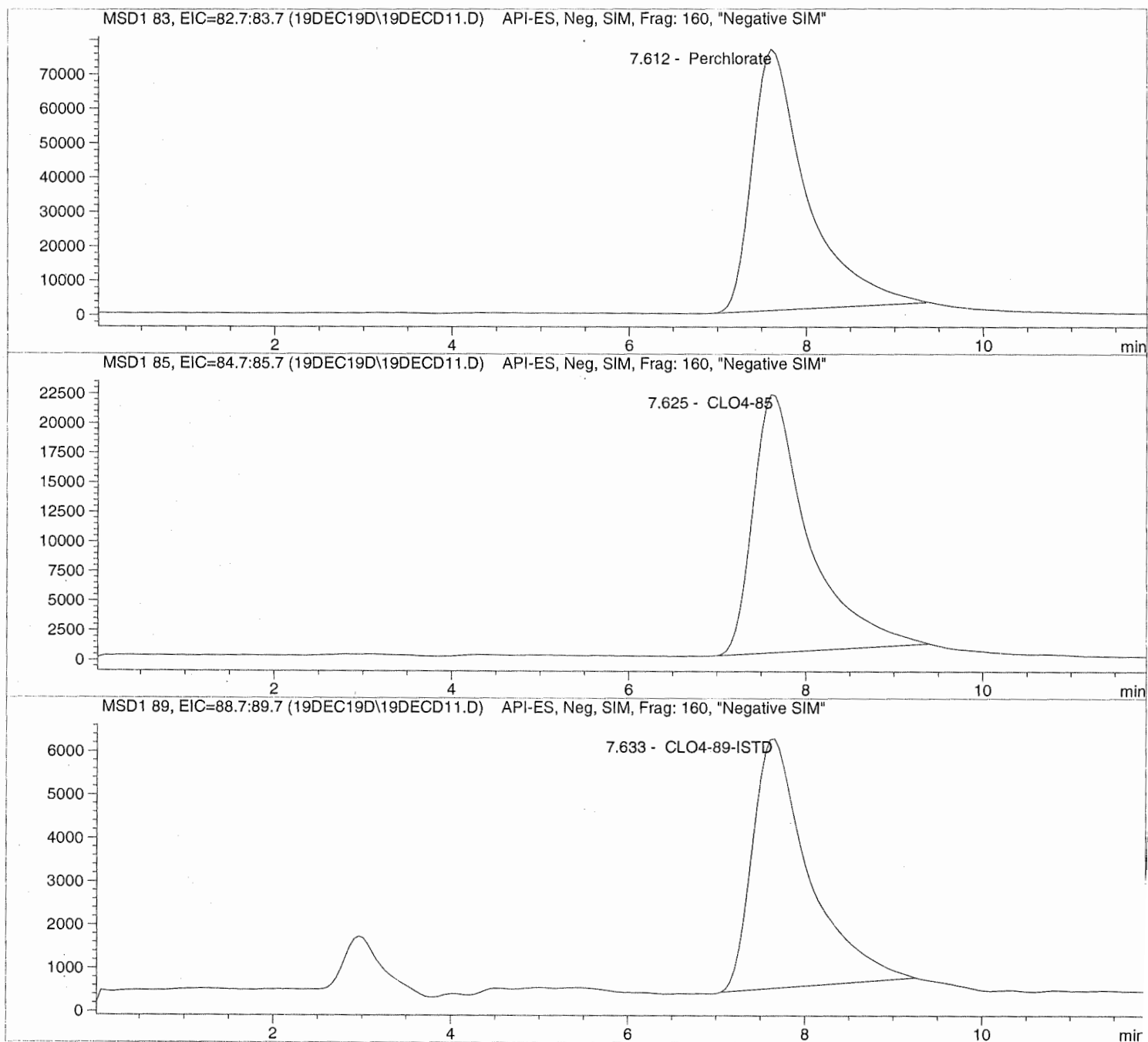
```

Data file: C:\HPCHEM\1\DATA\19DEC19D\19DECD11.D Sample Name: 1934606005 100

Injection Date: 12/19/2019 11:09:50 Seq Line: 11
Sample Name: 1934606005 100 Location: Vial 81
Acq Operator: TNB Inj. No.: 1
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19DEC19D\19DECD11.D Sample Name: 1934606005 100

```

=====
Injection Date: 12/19/2019 11:09:50      Seq Line:           11
Sample Name:    1934606005 100           Location:           Vial 81
Acq Operator:   TNB                      Inj. No.:          1
                                           Inj. Vol.:         35 µl
  
```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   11/5/2019 08:44:45
  
```

Perchlorate analysis

Sample Information

```

=====
Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019, 00:20:59 pm
Multiplier:     1.000000
Dilution:       100 TB 1.000000
Sample Amount:  12.20 µl 0.000
  
```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.612	PBA	3240977.8	40.7378	Perchlorate $\times 100$

4,073.78

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.625	PBA	949000.1	39.4998	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.633	PBA	255099.2	5.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19DEC19D\19DECD13.D

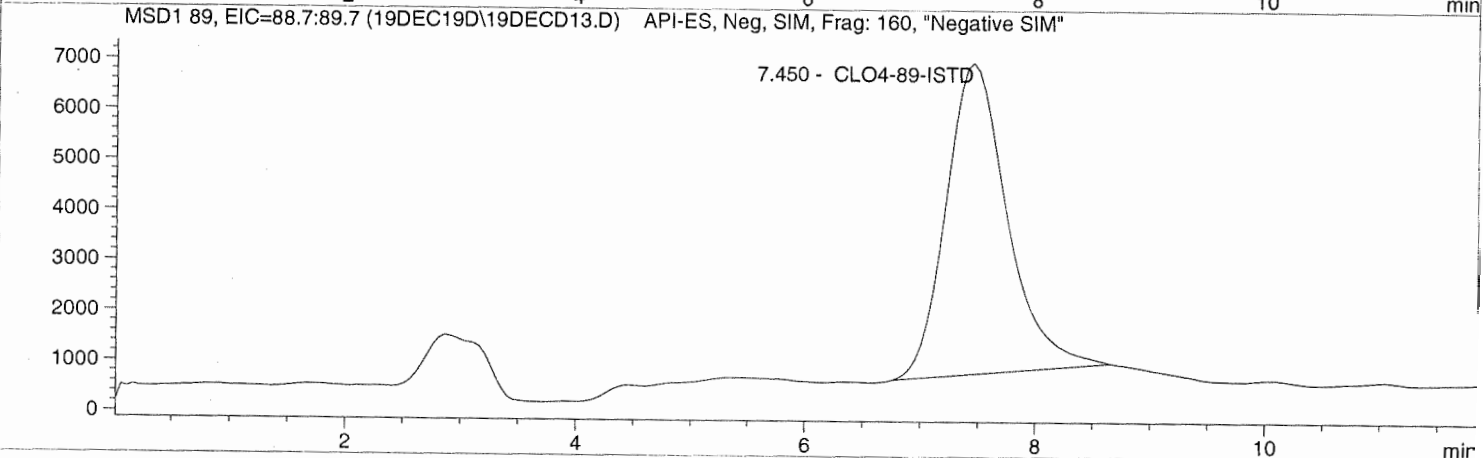
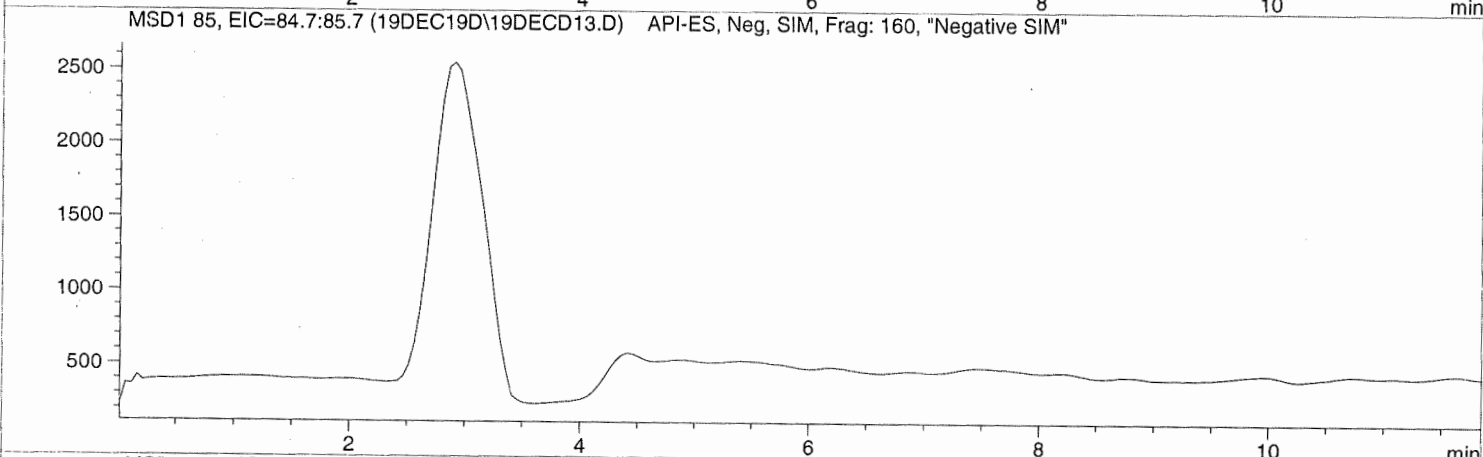
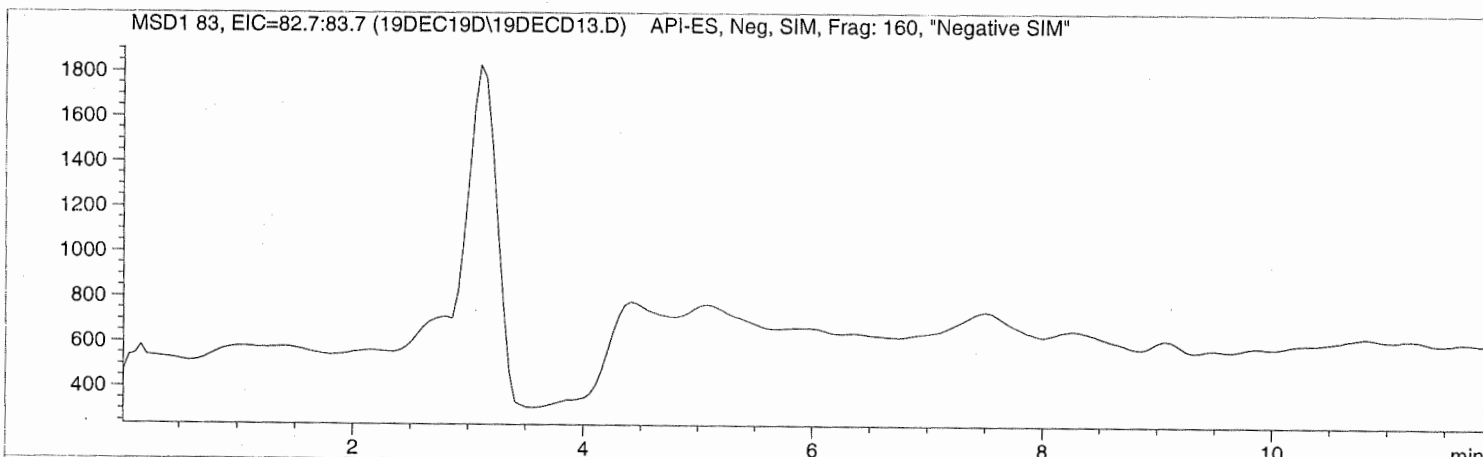
Sample Name: 1934606007

Injection Date: 12/19/2019 11:37:31
Sample Name: 1934606007
Acq Operator: TNB

Seq Line: 13
Location: Vial 83
Inj. No.: 1
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19DEC19D\19DECD13.D Sample Name: 1934606007

```
=====
Injection Date: 12/19/2019 11:37:31      Seq Line: 13
Sample Name: 1934606007                  Location: Vial 83
Acq Operator: TNB                         Inj. No.: 1
                                           Inj. Vol.: 35 µl
=====
```

```
Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45
```

Perchlorate analysis

Sample Information

```
Sorted By: Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 0.000
```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.450	PBA	228101.0	5.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19DEC19D\19DECD14.D

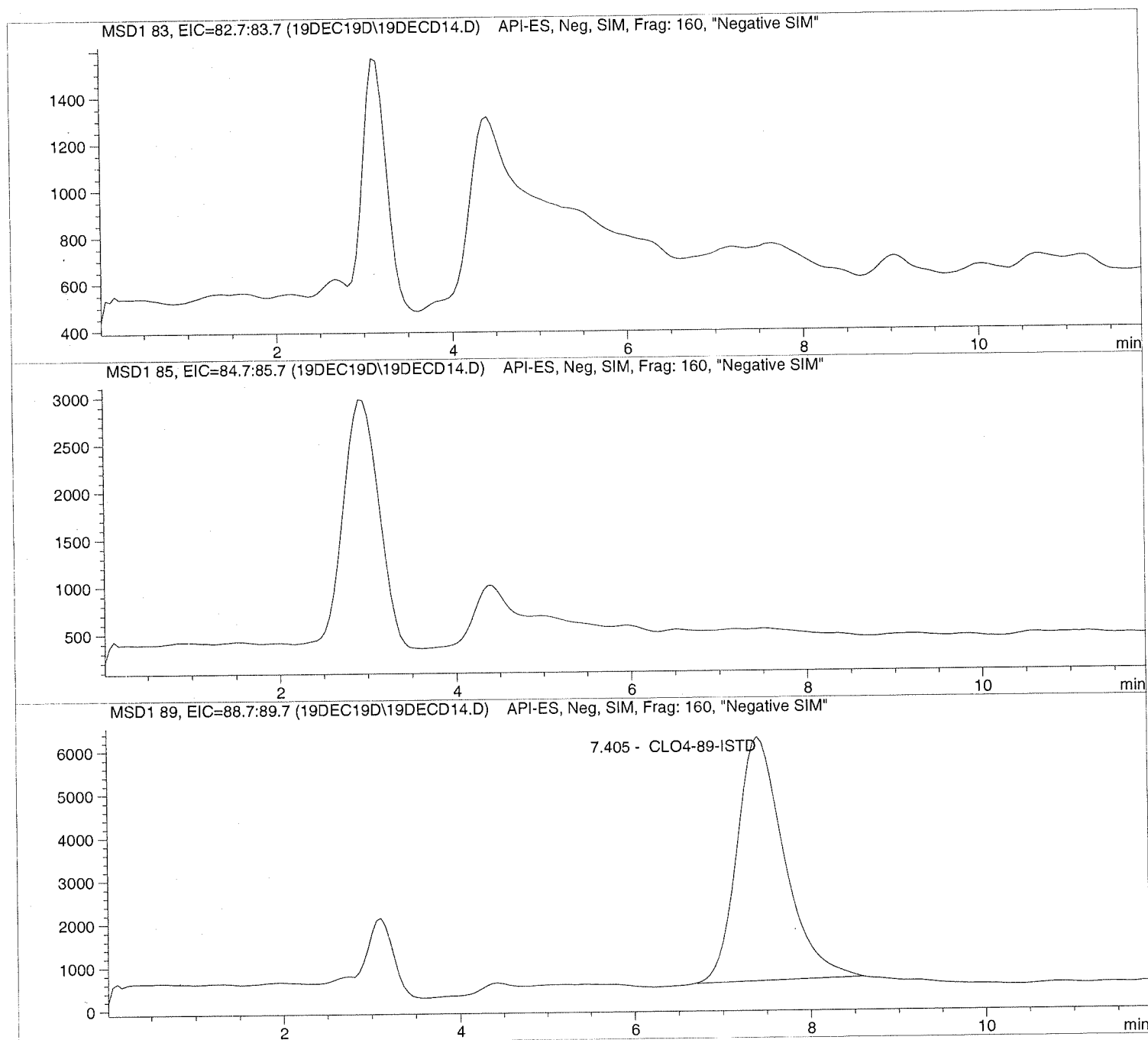
Sample Name: 1934606008

Injection Date: 12/19/2019 11:51:28
Sample Name: 1934606008
Acq Operator: TNB

Seq Line: 14
Location: Vial 84
Inj. No.: 1
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19DEC19D\19DECD14.D Sample Name: 1934606008

```

=====
Injection Date: 12/19/2019 11:51:28      Seq Line: 14
Sample Name: 1934606008                  Location: Vial 84
Acq Operator: TNB                         Inj. No.: 1
                                           Inj. Vol.: 35 µl
=====

```

```

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By: Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 0.000
=====

```

```

=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.405	BBA	211488.5	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

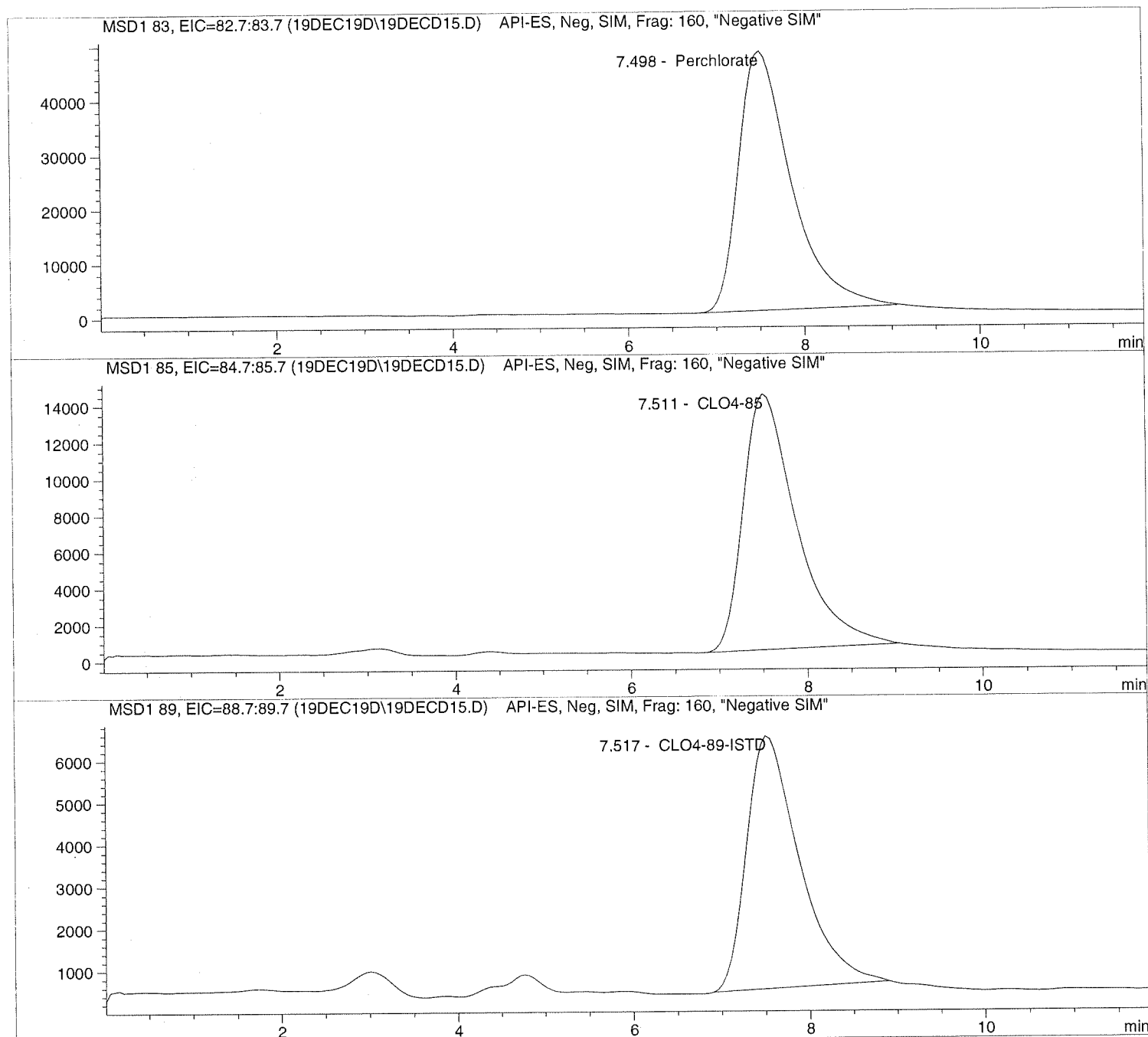
```

Data file: C:\HPCHEM\1\DATA\19DEC19D\19DECD15.D Sample Name: 689018 CCV@25

Injection Date: 12/19/2019 12:05:21 Seq Line: 15
Sample Name: 689018 CCV@25 Location: Vial 71
Acq Operator: TNB Inj. No.: 1
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19DEC19D\19DECD15.D Sample Name: 689018 CCV@25

```

=====
Injection Date: 12/19/2019 12:05:21      Seq Line:      15
Sample Name:   689018   CCV@25           Location:      Vial 71
Acq Operator:  TNB                                           Inj. No.:     1
                                           Inj. Vol.:    35 µl
  
```

```

Acq. Method:   CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:  11/5/2019 08:44:45
  
```

Perchlorate analysis

Sample Information

```

=====
Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:    1.000000
Dilution:     1.000000
Sample Amount: 25.000
  
```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.498	PBA	1974913.9	26.8427	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.511	PBA	586422.3	26.2182	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.517	PBA	249494.6	5.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19DEC19D\19DECD16.D

Sample Name: 1934611001

Injection Date: 12/19/2019 12:19:13

Seq Line: 16

Sample Name: 1934611001

Location: Vial 85

Acq Operator: TNB

Inj. No.: 1

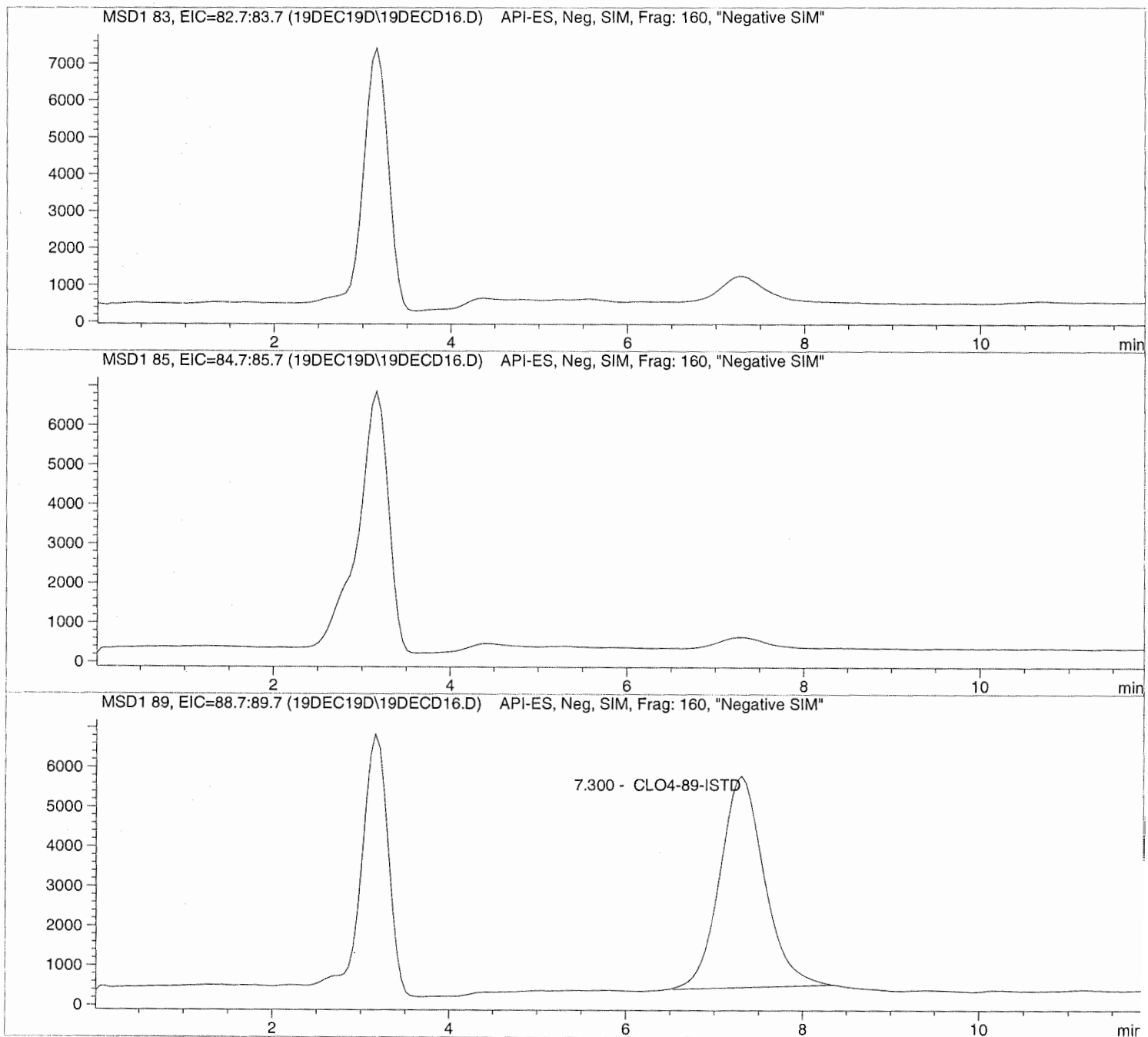
Inj. Vol.: 35 μ l

Acq. Method: CLO4-AQN.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M

Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19DEC19D\19DECD16.D

Sample Name: 1934611001

```

=====
Injection Date: 12/19/2019 12:19:13      Seq Line: 16
Sample Name: 1934611001                  Location: Vial 85
Acq Operator: TNB                        Inj. No.: 1
                                           Inj. Vol.: 35 µl
=====

```

```

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By: Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 0.000
=====

```

```

=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.300	BBA	186290.0	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\19DEC19D\19DECD17.D

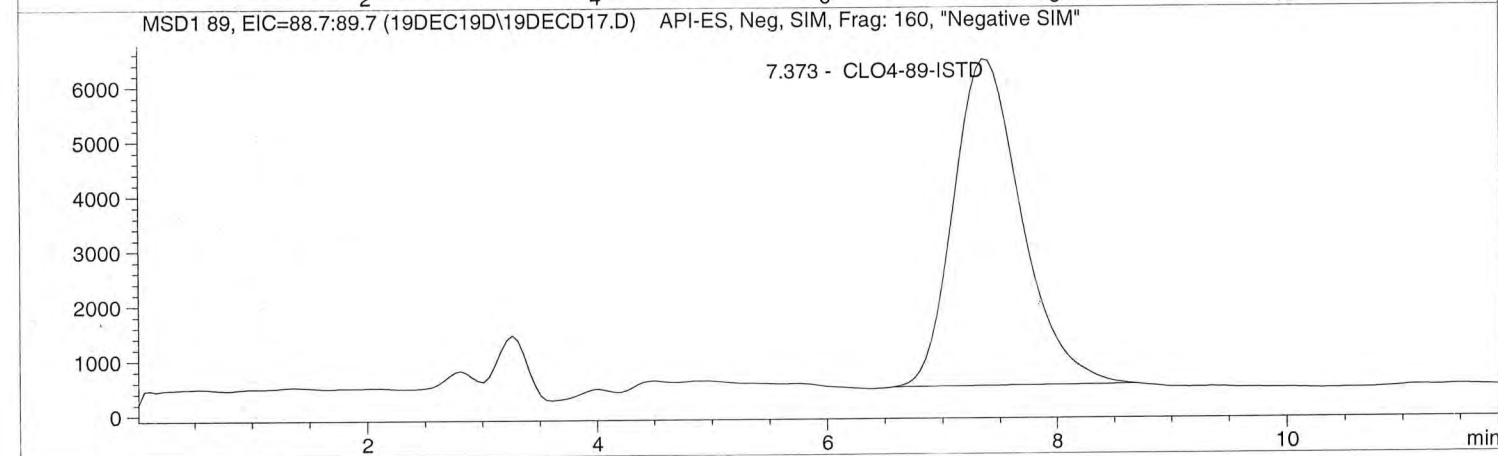
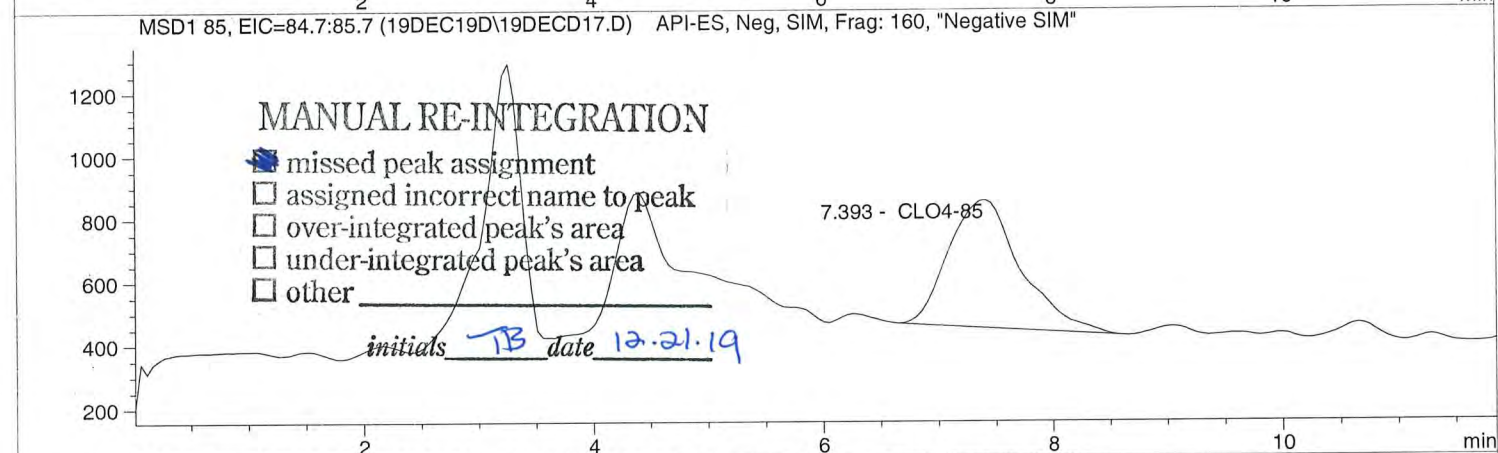
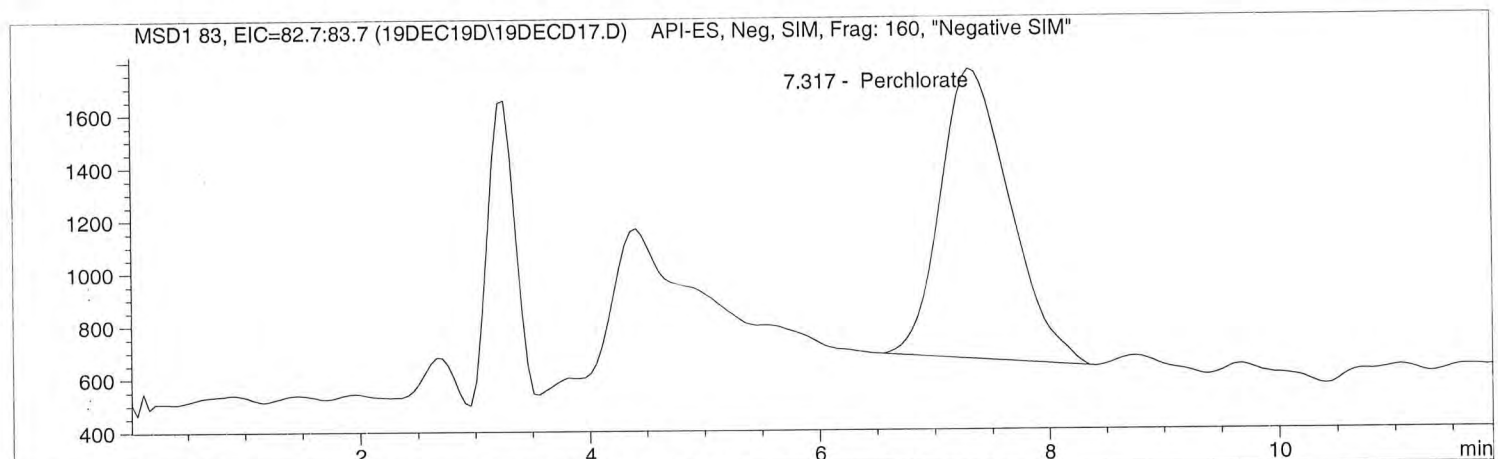
Sample Name: 1934611002

Injection Date: 12/19/2019 12:33:05
Sample Name: 1934611002
Acq Operator: TNB

Seq Line: 17
Location: Vial 86
Inj. No.: 1
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19DEC19D\19DEC17.D Sample Name: 1934611002

```

=====
Injection Date: 12/19/2019 12:33:05      Seq Line:          17
Sample Name:    1934611002                Location:         Vial 86
Acq Operator:   TNB                       Inj. No.:        1
                                           Inj. Vol.:       35 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  0.000
=====

```

```

=====
                          LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.317	PBA	45813.6	0.6291	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.393	MM	17535.8	0.7243	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.373	PBA	245674.1	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

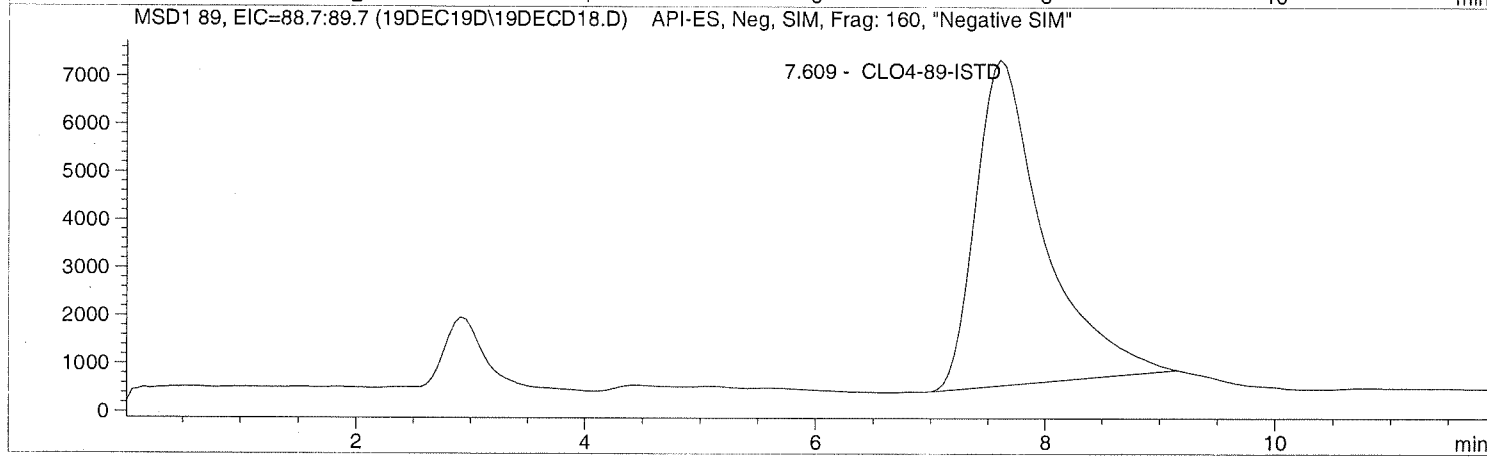
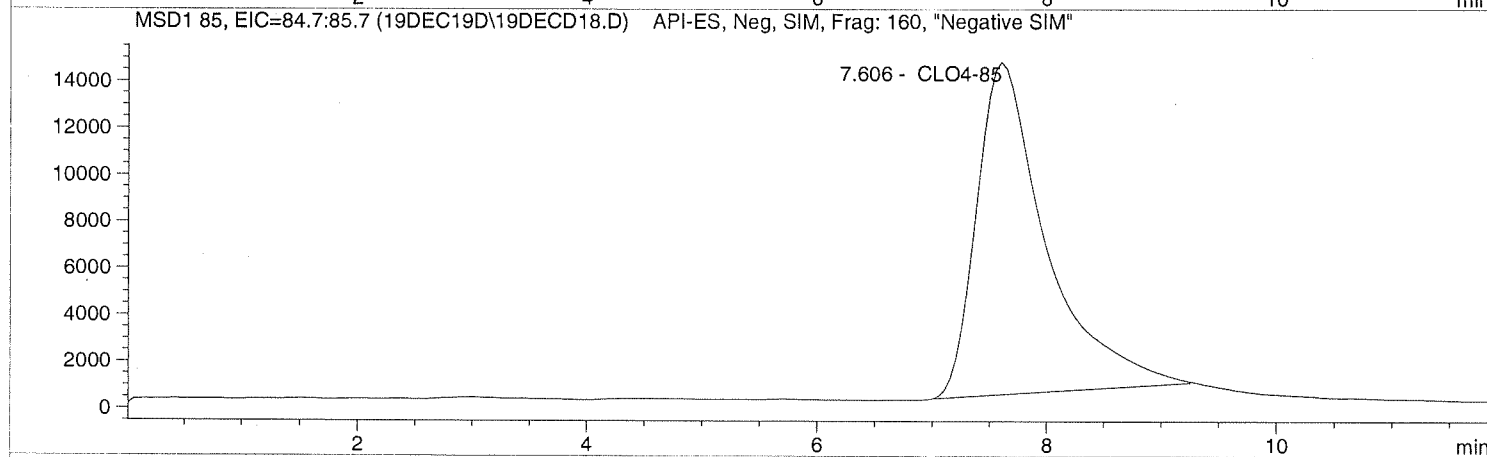
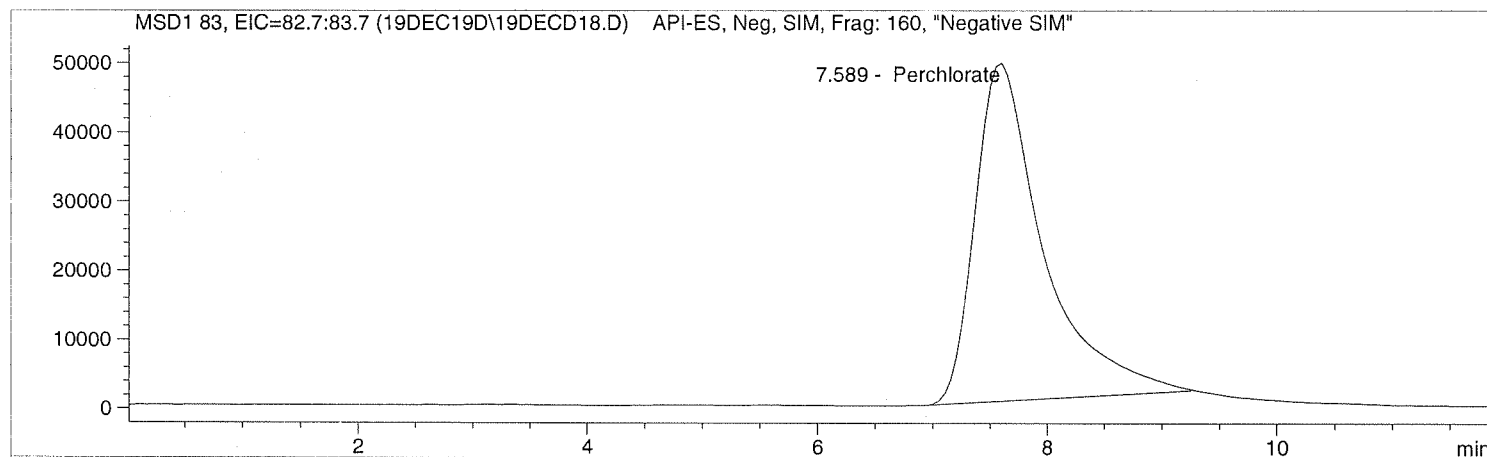
```

Data file: C:\HPCHEM\1\DATA\19DEC19D\19DECD18.D Sample Name: 1934611003 1K

=====
Injection Date: 12/19/2019 12:46:55 Seq Line: 18
Sample Name: 1934611003 1K Location: Vial 87
Acq Operator: TNB Inj. No.: 1
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis
=====



Data file: C:\HPCHEM\1\DATA\19DEC19D\19DECD18.D Sample Name: 1934611003 1K

```

=====
Injection Date: 12/19/2019 12:46:55      Seq Line:          18
Sample Name:    1934611003 1K           Location:          Vial 87
Acq Operator:   TNB                     Inj. No.:         1
                                           Inj. Vol.:        35 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1000.000000
Sample Amount:  0.000
=====

```

```

=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.589	PBA	2029878.7	24701.4141	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.606	PBA	601144.7	24045.5273	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.609	PBA	281136.2	5000.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\19DEC19D\19DECD19.D

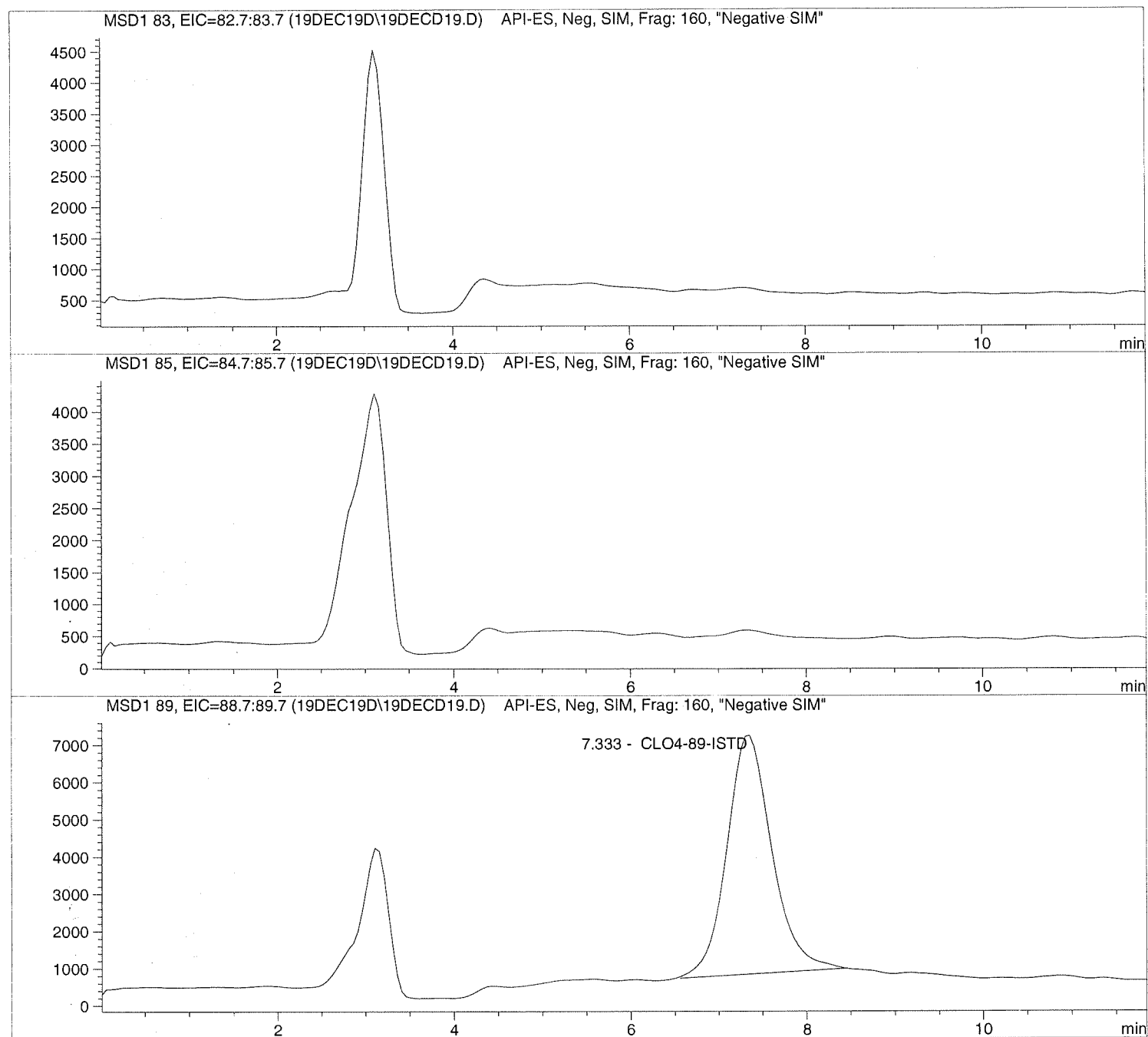
Sample Name: 1934611004

=====
Injection Date: 12/19/2019 13:00:48
Sample Name: 1934611004
Acq Operator: TNB

Seq Line: 19
Location: Vial 88
Inj. No.: 1
Inj. Vol.: 35 μ l

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19DEC19D\19DECD19.D Sample Name: 1934611004

```
=====
Injection Date: 12/19/2019 13:00:48      Seq Line: 19
Sample Name: 1934611004                  Location: Vial 88
Acq Operator: TNB                        Inj. No.: 1
                                           Inj. Vol.: 35 µl
=====
```

```
Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45
```

Perchlorate analysis

Sample Information

```
Sorted By: Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 0.000
```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.333	PBA	229273.0	5.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19DEC19D\19DECD20.D

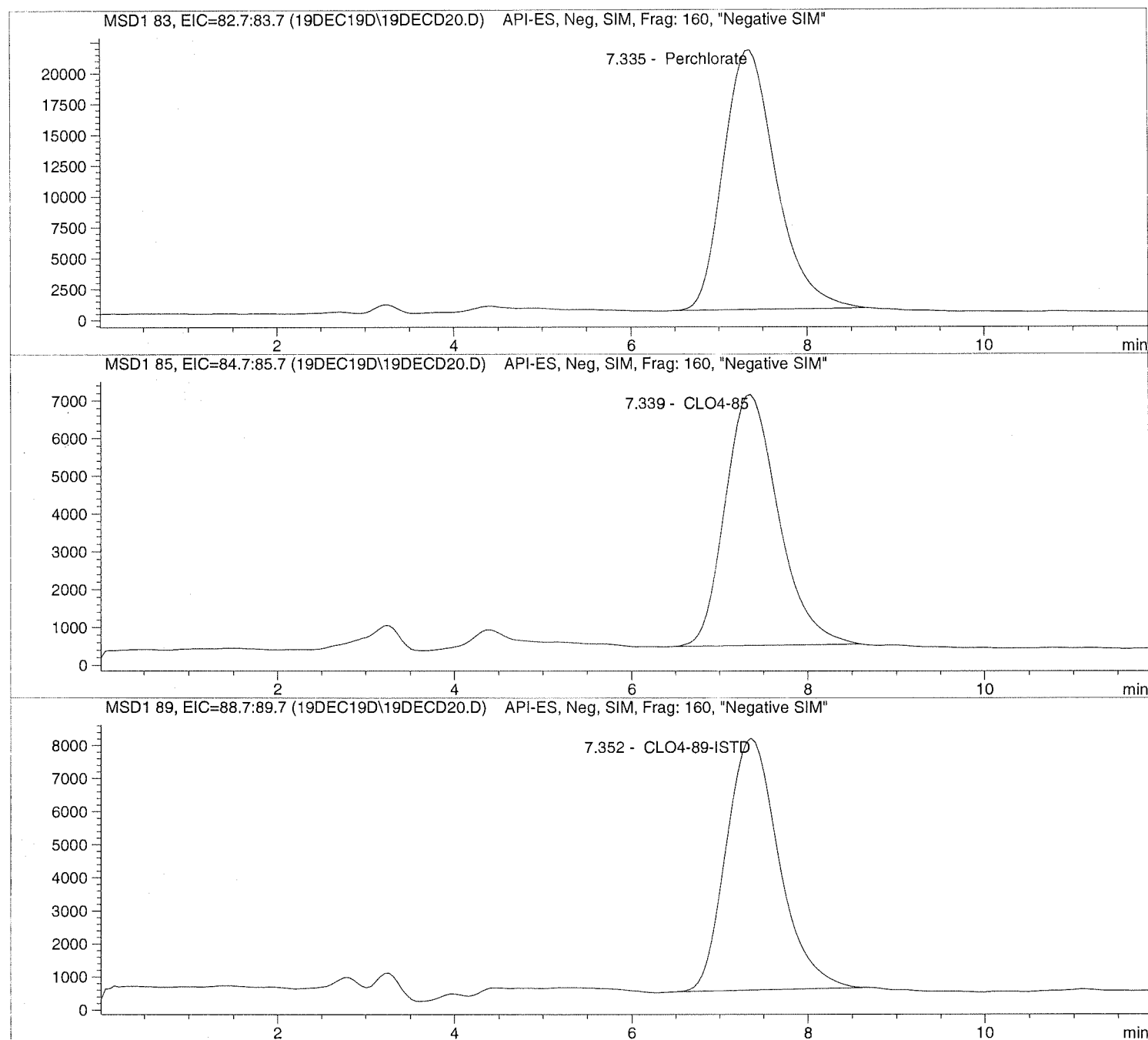
Sample Name: 1934611005

Injection Date: 12/19/2019 13:14:44
Sample Name: 1934611005
Acq Operator: TNB

Seq Line: 20
Location: Vial 89
Inj. No.: 1
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19DEC19D\19DECD20.D

Sample Name: 1934611005

```

=====
Injection Date: 12/19/2019 13:14:44      Seq Line:          20
Sample Name:   1934611005                Location:          Vial 89
Acq Operator:  TNB                       Inj. No.:         1
                                           Inj. Vol.:        35 µl
=====

```

```

Acq. Method:   CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:  11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:          Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:         1.000000
Dilution:           1.000000
Sample Amount:      0.000
=====

```

```

=====
                          LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.335	PBA	868102.6	9.9723	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.339	PBA	278308.8	10.3779	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.352	PBA	316177.7	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\19DEC19D\19DECD21.D

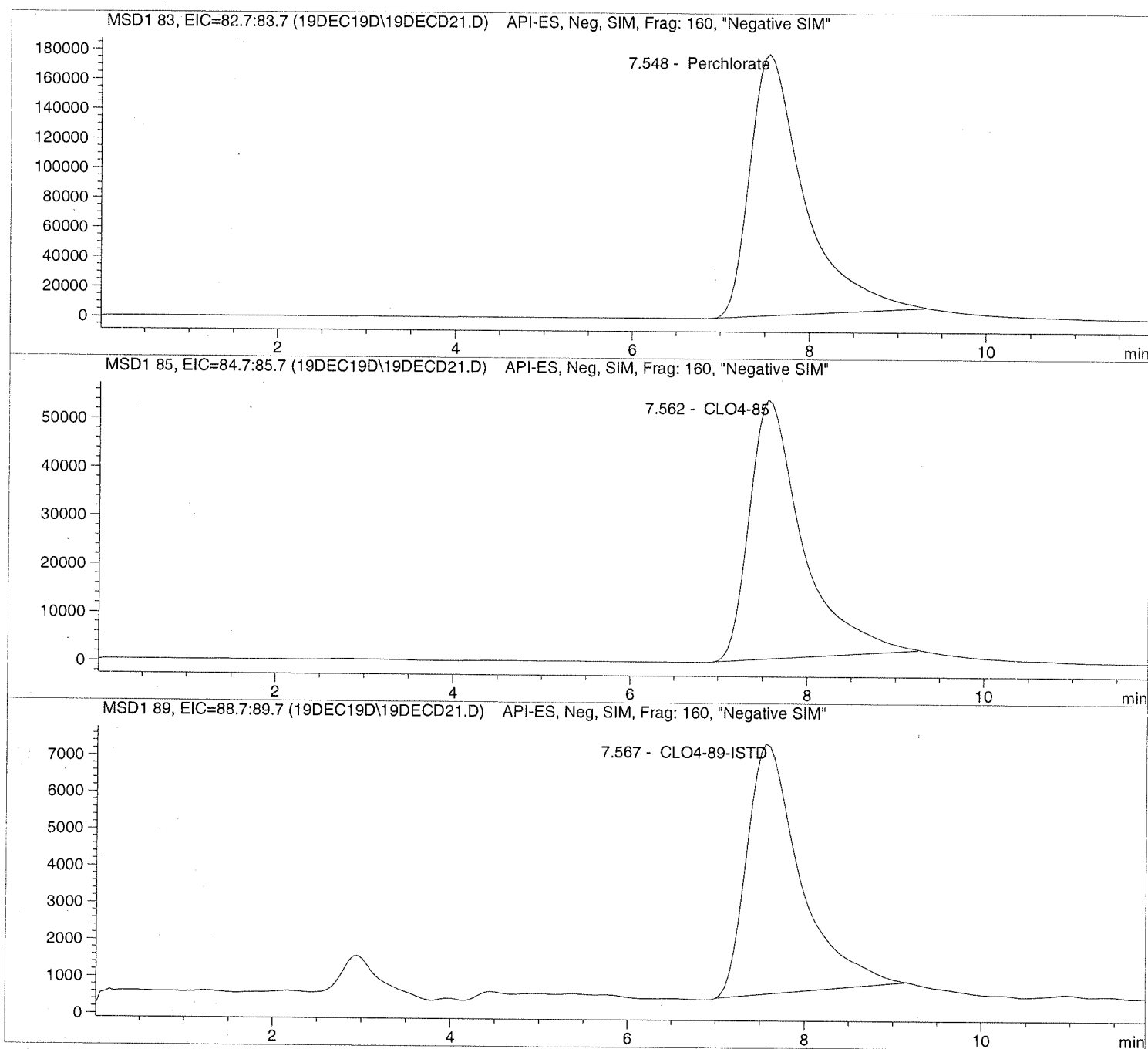
Sample Name: 1934611006 1K

=====
Injection Date: 12/19/2019 13:28:39
Sample Name: 1934611006 1K
Acq Operator: TNB

=====
Seq Line: 21
Location: Vial 90
Inj. No.: 1
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19DEC19D\19DECD21.D Sample Name: 1934611006 1K

```

=====
Injection Date: 12/19/2019 13:28:39      Seq Line:          21
Sample Name:    1934611006 1K           Location:         Vial 90
Acq Operator:   TNB                     Inj. No.:        1
                                           Inj. Vol.:       35 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   11/5/2019 08:44:45
=====

```

Perchlorate analysis

Sample Information

```

=====
Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1000.000000
Sample Amount:  0.000
=====

```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.548	PBA	7487619.0	74495.3427	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.562	PBA	2221116.0	73629.1625	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.567	PBA	284295.8	5000.0000	CLO4-89-ISTD

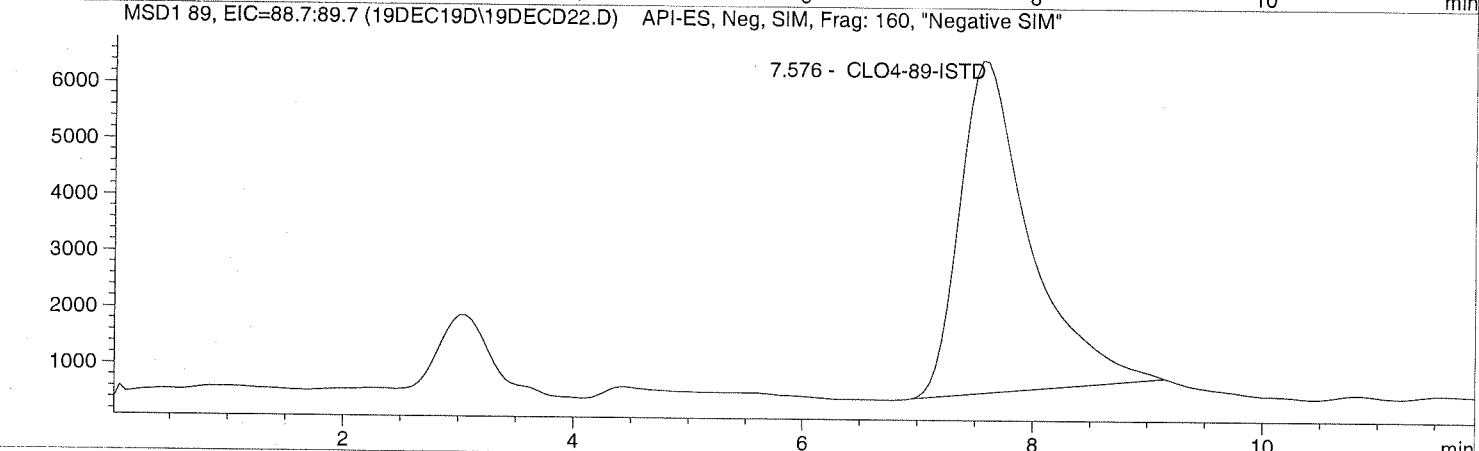
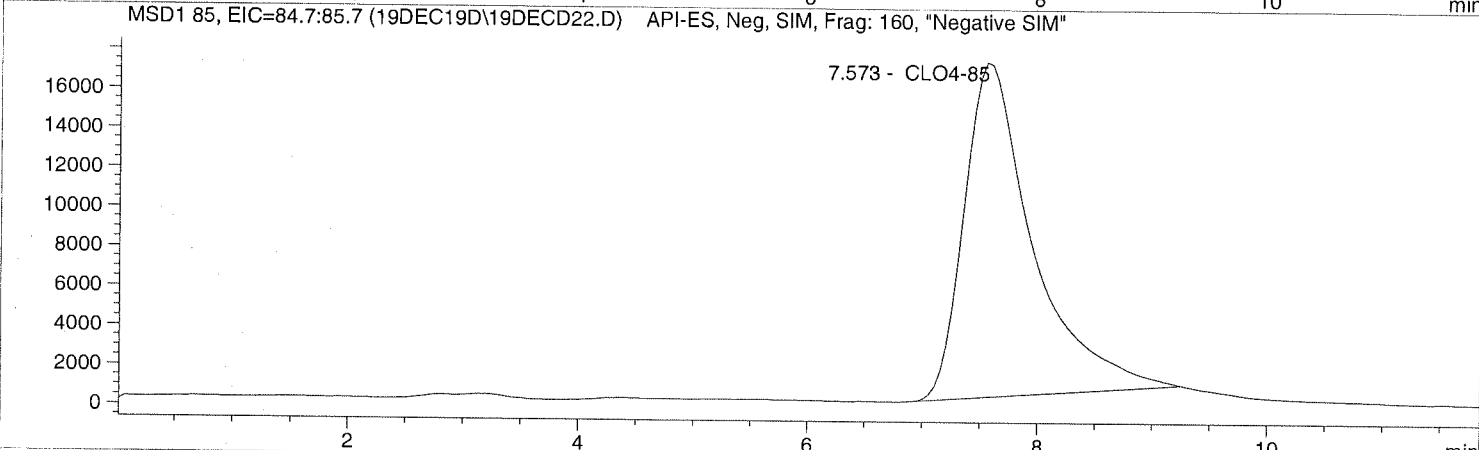
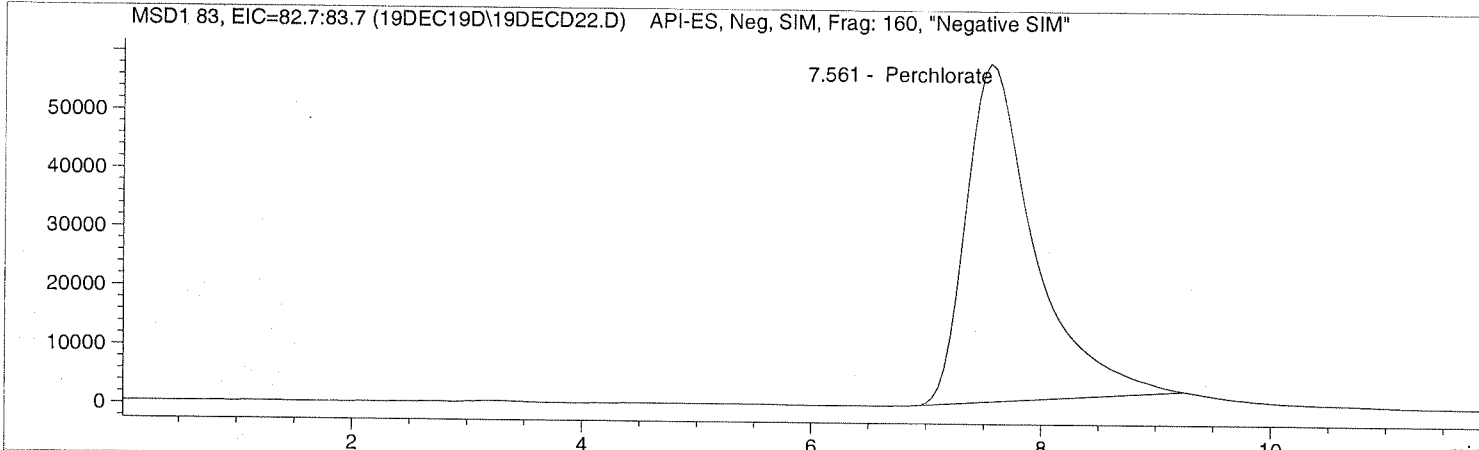
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19DEC19D\19DECD22.D Sample Name: 1934606006 10X

=====
Injection Date: 12/19/2019 13:42:34 Seq Line: 22
Sample Name: 1934606006 10X Location: Vial 91
Acq Operator: TNB Inj. No.: 1
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19DEC19D\19DECD22.D Sample Name: 1934606006 10X

```
=====
Injection Date: 12/19/2019 13:42:34      Seq Line: 22
Sample Name: 1934606006 10X              Location: Vial 91
Acq Operator: TNB                          Inj. No.: 1
                                           Inj. Vol.: 35 µl
=====
```

```
Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45
```

Perchlorate analysis

Sample Information

```
Sorted By: Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier: 1.000000
Dilution: 10.000000
Sample Amount: 0.000
```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.561	PBA	2375332.8	316.8617	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.573	PBA	703769.4	309.4659	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.576	PBA	249233.1	50.0000	CLO4-89-ISTD

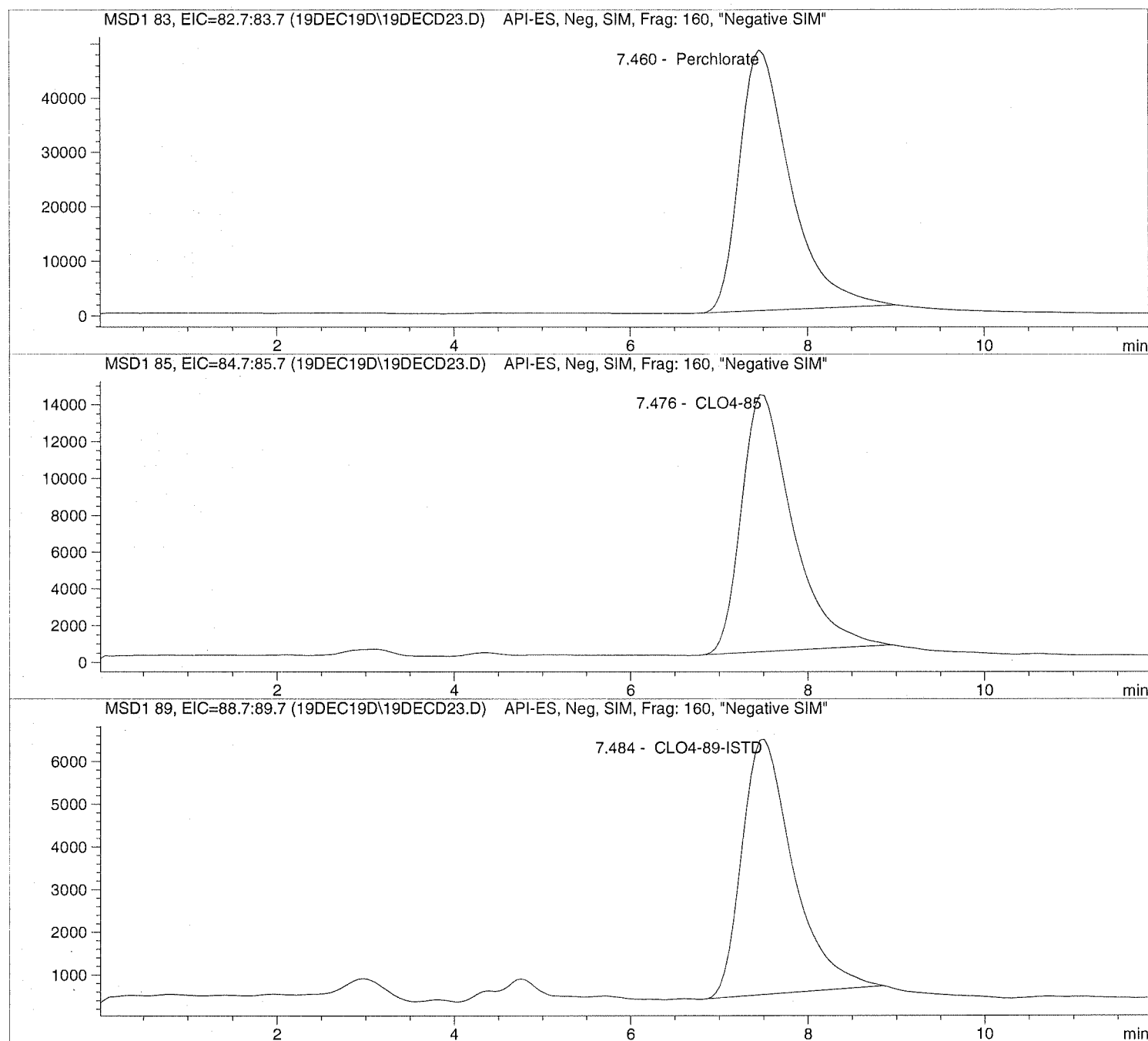
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19DEC19D\19DECD23.D Sample Name: 689019 CCV@25

=====
Injection Date: 12/19/2019 13:56:24 Seq Line: 23
Sample Name: 689019 CCV@25 Location: Vial 71
Acq Operator: TNB Inj. No.: 1
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis
=====



Data file: C:\HPCHEM\1\DATA\19DEC19D\19DECD23.D Sample Name: 689019 CCV@25

```

=====
Injection Date: 12/19/2019 13:56:24      Seq Line:      23
Sample Name:    689019  CCV@25           Location:      Vial 71
Acq Operator:   TNB                      Inj. No.:     1
                                           Inj. Vol.:    35 µl
  
```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   11/5/2019 08:44:45
  
```

Perchlorate analysis

Sample Information

```

=====
Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  25.000
  
```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.460	PBA	1916956.3	27.0329	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.476	PBA	562099.7	26.1054	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.484	PBA	240281.0	5.0000	CLO4-89-ISTD

*** End of Report ***



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Initial Calibration

```

=====
                        Calibration Table
=====

```

Perchlorate

```

Calib. Data Modified   :      9/23/2019 12:20:59 PM

Calculate              :      Internal Standard
Based on              :      Peak Area

Rel. Reference Window :      20.000 %
Abs. Reference Window :      0.000 min
Rel. Non-ref. Window  :      20.000 %
Abs. Non-ref. Window  :      0.000 min
Use Multiplier & Dilution Factor with ISTDs
Uncalibrated Peaks    :      not reported
Partial Calibration    :      No recalibration if peaks missing

Curve Type            :      Quadratic (some peaks differ, see below)
Origin                :      Ignored (some peaks differ, see below)
Weight                :      Linear (Amt) (some peaks differ, see below)

Recalibration Settings:
Average Response      :      Average all calibrations
Average Retention Time:      Floating Average New 75%

```

Calibration Report Options :

```

Printout of recalibrations within a sequence:
  Calibration Table after Recalibration
  Normal Report after Recalibration
If the sequence is done with bracketing:
  Results of first cycle (ending previous bracket)

```

Default Sample ISTD Information (if not set in sample table):

```
ISTD ISTD Amount Name
```

```
#
-----|-----|-----
1      5.00000  CLO4-89-ISTD
```

```
Signal 1: MSD1 83, EIC=82.7:83.7
Signal 2: MSD1 85, EIC=84.7:85.7
Signal 3: MSD1 89, EIC=88.7:89.7
```

RetTime	Lvl	Amount	Area	Amt/Area	Ref	Grp	Name
[min]	Sig						
7.750	1	3	1.00000	5.39218e4	1.85454e-5	1	Perchlorate
		4	2.00000	1.32825e5	1.50574e-5		
		5	5.00000	2.76271e5	1.80982e-5		
		6	10.00000	5.61298e5	1.78159e-5		
		7	25.00000	1.51820e6	1.64669e-5		
		8	50.00000	3.31156e6	1.50986e-5		
		9	75.00000	5.23914e6	1.43153e-5		
7.767	3	3	5.00000	2.14568e5	2.33026e-5	+I1	CLO4-89-ISTD
		4	5.00000	2.04758e5	2.44190e-5		
		5	5.00000	2.13407e5	2.34294e-5		
		6	5.00000	2.09246e5	2.38953e-5		
		7	5.00000	2.07403e5	2.41077e-5		
		8	5.00000	2.02929e5	2.46391e-5		
		9	5.00000	1.97933e5	2.52611e-5		
7.778	2	3	1.00000	1.70436e4	5.86732e-5	1	CLO4-85
		4	2.00000	4.20754e4	4.75337e-5		
		5	5.00000	9.24707e4	5.40712e-5		
		6	10.00000	1.68622e5	5.93041e-5		
		7	25.00000	4.63724e5	5.39114e-5		
		8	50.00000	9.95933e5	5.02042e-5		

Method C:\HPCHEM\1\METHODS\CLO4-DP3.M

RetTime [min]	Lvl Sig	Amount	Area	Amt/Area	Ref Grp Name
9		75.00000	1.58066e6	4.74484e-5	

More compound-specific settings:

Compound: Perchlorate

Time Window : From 3.581 min To 11.899 min
 Curve Type : Quadratic
 Origin : Ignored
 Calibration Level Weights:/
 Level 3 : 1
 Level 4 : 0.5
 Level 5 : 0.2
 Level 6 : 0.1
 Level 7 : 0.04
 Level 8 : 0.02
 Level 9 : 0.013333

Compound: CLO4-89-ISTD

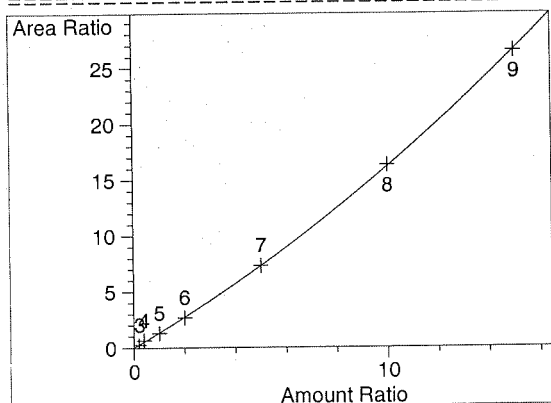
Time Window : From 3.581 min To 11.896 min
 Curve Type : Linear
 Origin : Included
 Calibration Level Weights:/
 Level 3 : 1
 Level 4 : 1
 Level 5 : 1
 Level 6 : 1
 Level 7 : 1
 Level 8 : 1
 Level 9 : 1

Compound: CLO4-85

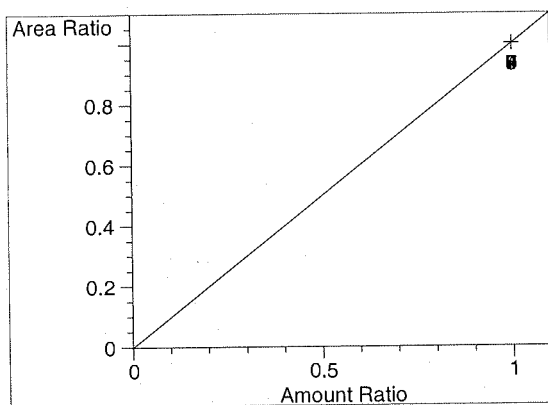
Time Window : From 3.601 min To 11.913 min
 Curve Type : Quadratic
 Origin : Ignored
 Calibration Level Weights:/
 Level 3 : 1
 Level 4 : 0.5
 Level 5 : 0.2
 Level 6 : 0.1
 Level 7 : 0.04
 Level 8 : 0.02
 Level 9 : 0.013333

```
=====
                          Peak Sum Table
=====
```

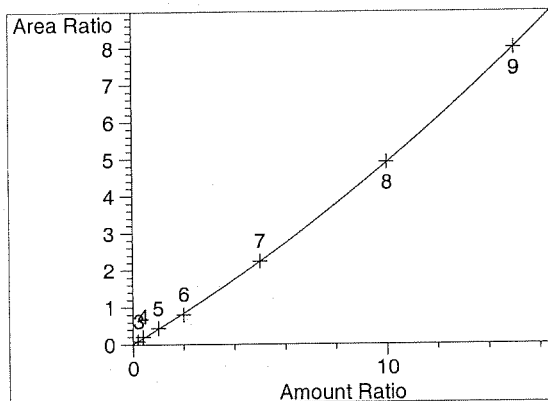
```
***No Entries in table***
=====
```

=====
 Calibration Curves
 =====


Perchlorate at exp. RT: 7.750
 MSD1 83, EIC=82.7:83.7
 Correlation: 0.99975
 Residual Std. Dev.: 0.10284
 Formula: $y = ax^2 + bx + c$
 a: 3.10463e-2
 b: 1.30369
 c: 2.19496e-2
 x: Amount Ratio
 y: Area Ratio
 Calibration Level Weights:
 Level 3 : 1
 Level 4 : 0.5
 Level 5 : 0.2
 Level 6 : 0.1
 Level 7 : 0.04
 Level 8 : 0.02
 Level 9 : 0.013333



CLO4-89-ISTD at exp. RT: 7.767
 MSD1 89, EIC=88.7:89.7
 Correlation: 1.00000
 Residual Std. Dev.: 0.00000
 Formula: $y = mx + b$
 m: 1.00000
 b: 0.00000
 x: Amount Ratio
 y: Area Ratio
 Calibration Level Weights:
 Level 3 : 1
 Level 4 : 1
 Level 5 : 1
 Level 6 : 1
 Level 7 : 1
 Level 8 : 1
 Level 9 : 1



CLO4-85 at exp. RT: 7.778
 MSD1 85, EIC=84.7:85.7
 Correlation: 0.99969
 Residual Std. Dev.: 0.02601
 Formula: $y = ax^2 + bx + c$
 a: 8.85207e-3
 b: 3.99283e-1
 c: 1.33505e-2
 x: Amount Ratio
 y: Area Ratio
 Calibration Level Weights:
 Level 3 : 1
 Level 4 : 0.5
 Level 5 : 0.2
 Level 6 : 0.1
 Level 7 : 0.04
 Level 8 : 0.02
 Level 9 : 0.013333

Batch Report: C:\HPCHEM\1\DATA\20SEP19I\20SEP19D.B

Batch Review Method:

C:\HPCHEM\1\METHODS\CLO4-DP3.M

['#' ==> Run has not been reprocessed with Batch Review Method

['*' ==> Run has been saved with batch file]

#*	Sample	Location	Inj	SampleType	Run	Perchlorate Area	Perchlorat RT	Perchlorate Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	5.39218e4	7.750	8.75982e-1
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	1.32825e5	7.797	2.37682
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	2.76271e5	7.770	4.77237
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	5.61298e5	7.785	9.75097
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	1.51820e6	7.741	25.01082
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	3.31156e6	7.775	50.40300
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	5.23914e6	7.736	74.79107
#*	ICAL Verf@10ug/L	Vial 80	1	Control	11	5.74879e5	7.756	10.11855

#*	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	2.14568e5	7.767	5.00000
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	2.04758e5	7.816	5.00000
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	2.13407e5	7.793	5.00000
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	2.09246e5	7.798	5.00000
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	2.07403e5	7.763	5.00000
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	2.02929e5	7.800	5.00000
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	1.97933e5	7.765	5.00000
#*	ICAL Verf@10ug/L	Vial 80	1	Control	11	2.06243e5	7.776	5.00000

#*	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	1.70436e4	7.778	8.24488e-1
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	4.20754e4	7.805	2.38090
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	9.24707e4	7.787	5.14166
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	1.68622e5	7.781	9.52209
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	4.63724e5	7.760	25.04916
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	9.95933e5	7.793	50.14223
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	1.58066e6	7.758	74.93659
#*	ICAL Verf@10ug/L	Vial 80	1	Control	11	1.71000e5	7.760	9.79043

*** End of Report ***

Sequence Table:

Method and Injection Info Part:

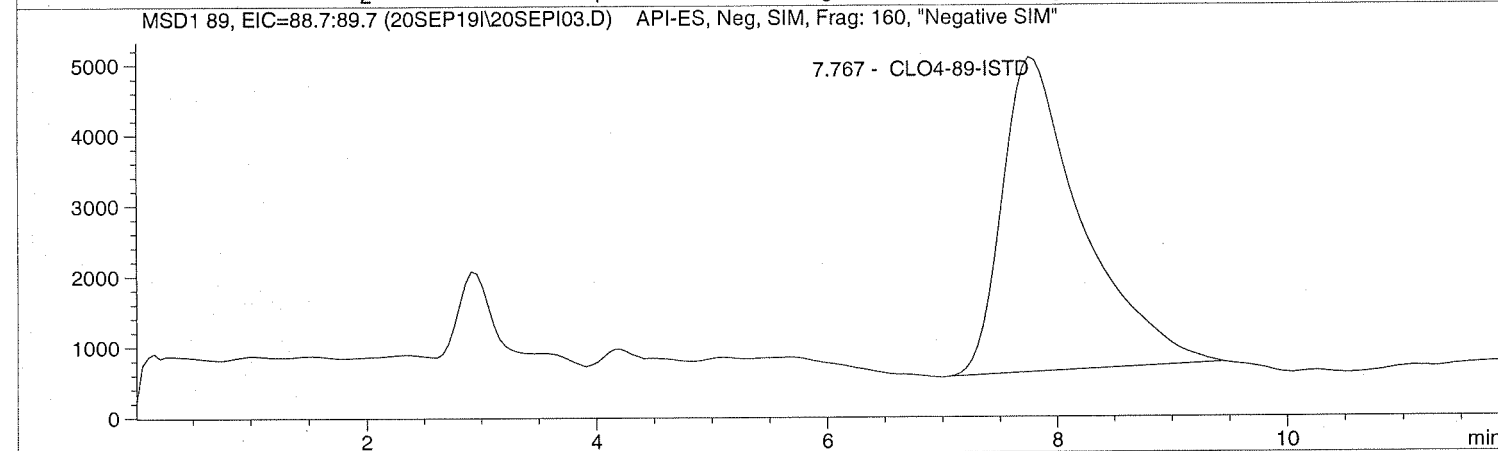
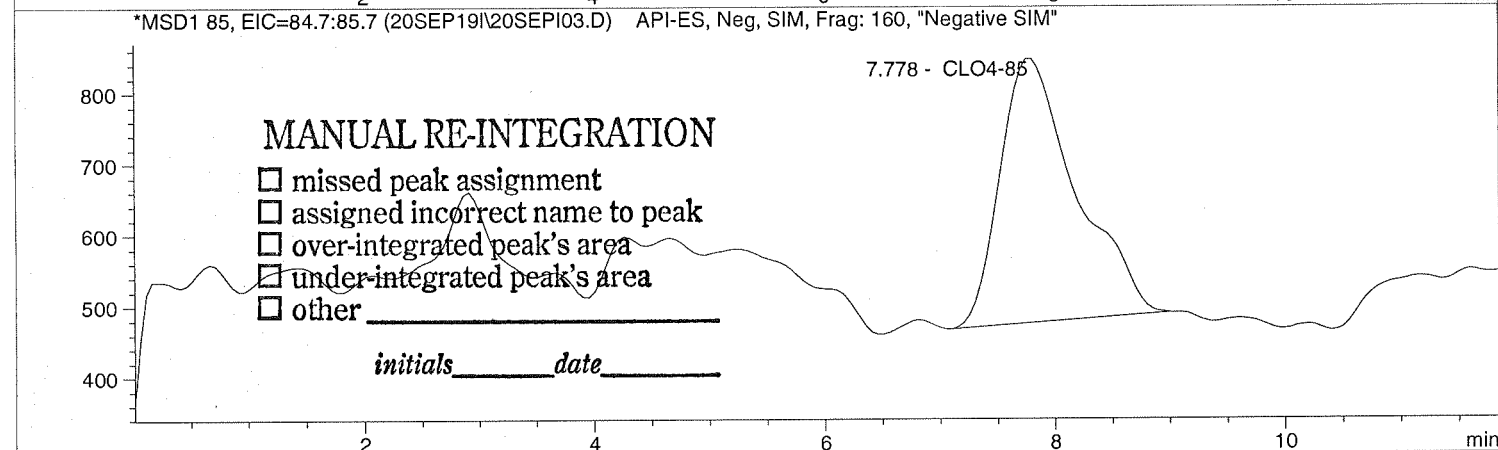
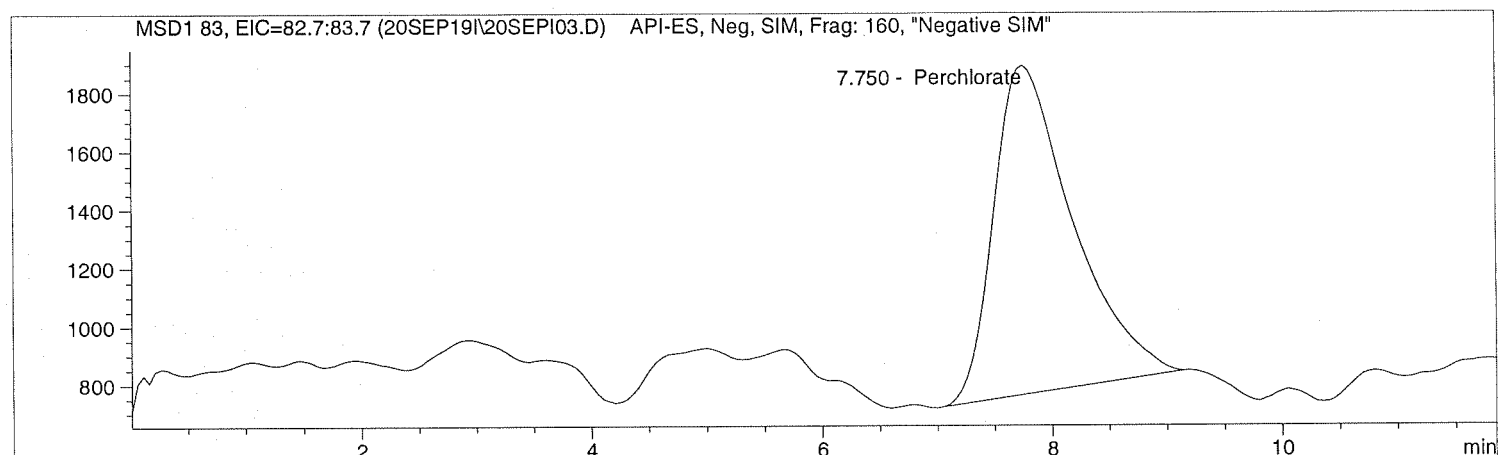
Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
====	=====	=====	=====	===	=====	=====	=====
1	Vial 71	CLO4@ 0.2ug/L	CLO4-AQN	1	Ctrl Samp		
2	Vial 72	CLO4@ 0.5ug/L	CLO4-AQN	1	Ctrl Samp		
3	Vial 73	CLO4@ 1.0ug/L	CLO4-AQN	1	Ctrl Samp		
4	Vial 74	CLO4@ 2.0ug/L	CLO4-AQN	1	Ctrl Samp		
5	Vial 75	CLO4@ 5.0ug/L	CLO4-AQN	1	Ctrl Samp		
6	Vial 76	CLO4@ 10.ug/L	CLO4-AQN	1	Ctrl Samp		
7	Vial 77	CLO4@ 25.ug/L	CLO4-AQN	1	Ctrl Samp		
8	Vial 78	CLO4@ 50.ug/L	CLO4-AQN	1	Ctrl Samp		
9	Vial 79	CLO4@ 75.ug/L	CLO4-AQN	1	Ctrl Samp		
10	Vial 71	CLO4@ 0.2ug/L	CLO4-AQN	1	Ctrl Samp		
11	Vial 80	ICAL Verf@10ug/L	CLO4-AQN	1	Ctrl Samp		

Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI03.D Sample Name: CLO4@ 1.0ug/L

=====
 Injection Date: 9/20/2019 09:24:05 Seq Line: 3
 Sample Name: CLO4@ 1.0ug/L Location: Vial 73
 Acq Operator: TNB Inj. No.: 1
 Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M
 Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
 Last Changed: 9/23/2019 12:21:47

Perchlorate analysis
 =====



Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI03.D Sample Name: CLO4@ 1.0ug/L

```

=====
Injection Date: 9/20/2019 09:24:05      Seq Line: 3
Sample Name:    CLO4@ 1.0ug/L          Location:  Vial 73
Acq Operator:   TNB                    Inj. No.: 1
                                           Inj. Vol.: 30 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   9/23/2019 12:21:47
=====

```

Perchlorate analysis

Sample Information

```

=====
Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:    1.000000
Dilution:      1.000000
Sample Amount: 1.000
=====

```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.750	PBA	53921.8	0.8760	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.778	MM	17043.6	0.8245	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.767	PBA	214568.1	5.0000	CLO4-89-ISTD

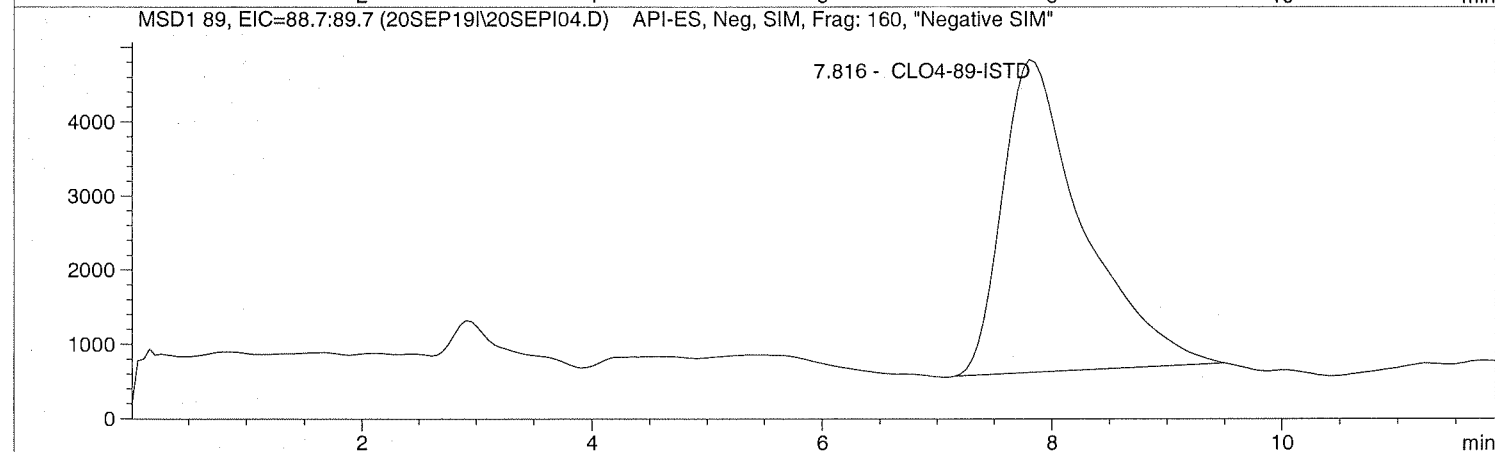
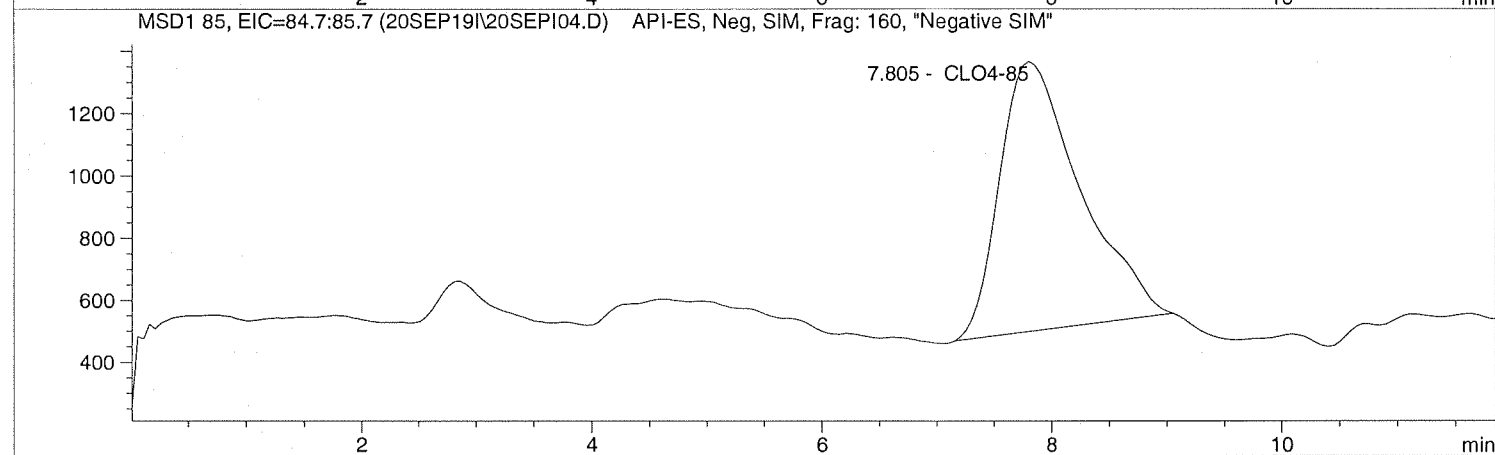
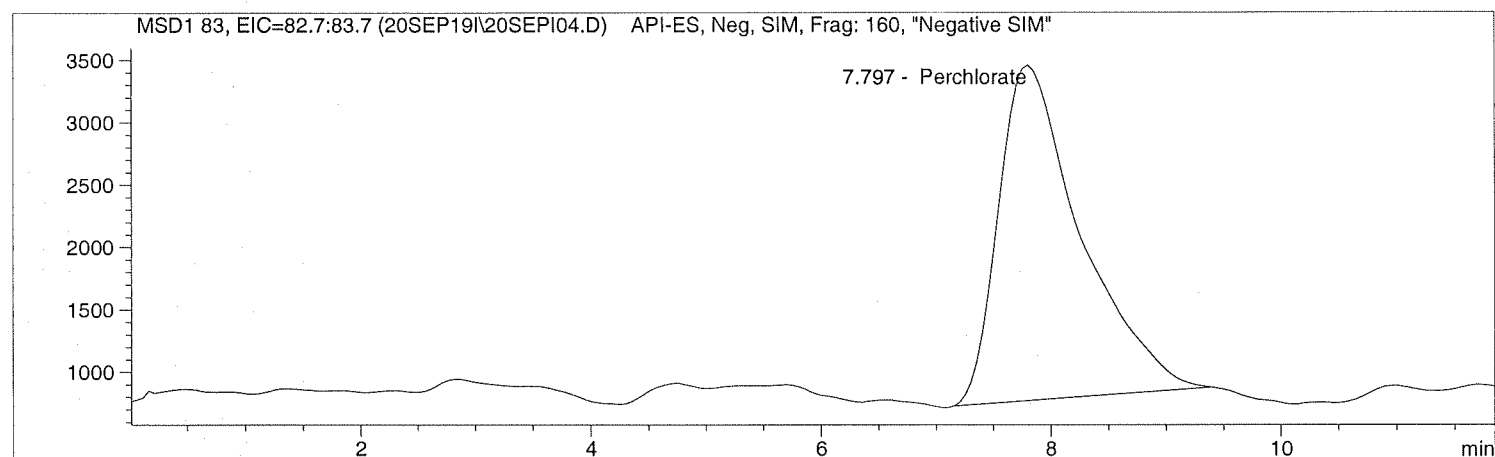
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI04.D Sample Name: CLO4@ 2.0ug/L

=====
Injection Date: 9/20/2019 09:37:58 Seq Line: 4
Sample Name: CLO4@ 2.0ug/L Location: Vial 74
Acq Operator: TNB Inj. No.: 1
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:21:47

Perchlorate analysis
=====



Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI04.D

Sample Name: CLO4@ 2.0ug/L

```

=====
Injection Date:  9/20/2019  09:37:58          Seq Line:           4
Sample Name:    CLO4@ 2.0ug/L              Location:           Vial 74
Acq Operator:   TNB                        Inj. No.:          1
                                           Inj. Vol.:         30 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   9/23/2019  12:21:47
=====

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:           Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:         1.000000
Dilution:           1.000000
Sample Amount:      2.000
=====

```

```

=====
                          LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.797	PBA	132825.2	2.3768	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.805	PBA	42075.4	2.3809	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.816	PBA	204758.3	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

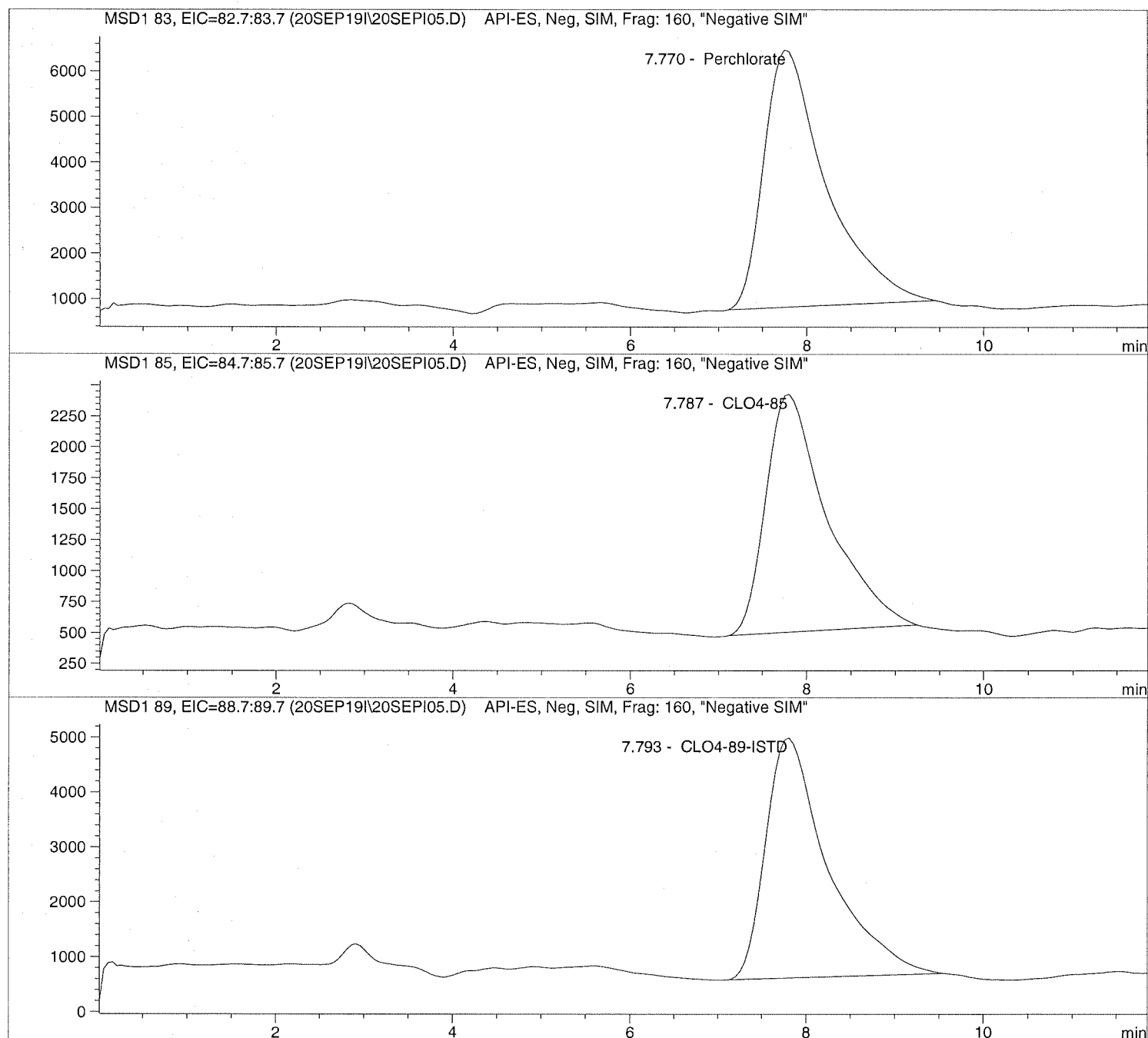
```

Data file: C:\HPCHEM\1\DATA\20SEP19\20SEPI05.D Sample Name: CLO4@ 5.0ug/L

=====
Injection Date: 9/20/2019 09:51:49 Seq Line: 5
Sample Name: CLO4@ 5.0ug/L Location: Vial 75
Acq Operator: TNB Inj. No.: 1
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:21:47

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI05.D

Sample Name: CLO4@ 5.0ug/L

```

=====
Injection Date: 9/20/2019 09:51:49      Seq Line: 5
Sample Name:    CLO4@ 5.0ug/L          Location:  Vial 75
Acq Operator:  TNB                     Inj. No.: 1
                                           Inj. Vol.: 30 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   9/23/2019 12:21:47
=====

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:    1.000000
Dilution:     1.000000
Sample Amount: 5.000
=====

```

```

=====
                          LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.770	PBA	276270.7	4.7724	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.787	PBA	92470.7	5.1417	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.793	PBA	213407.0	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\20SEP19\20SEPI06.D

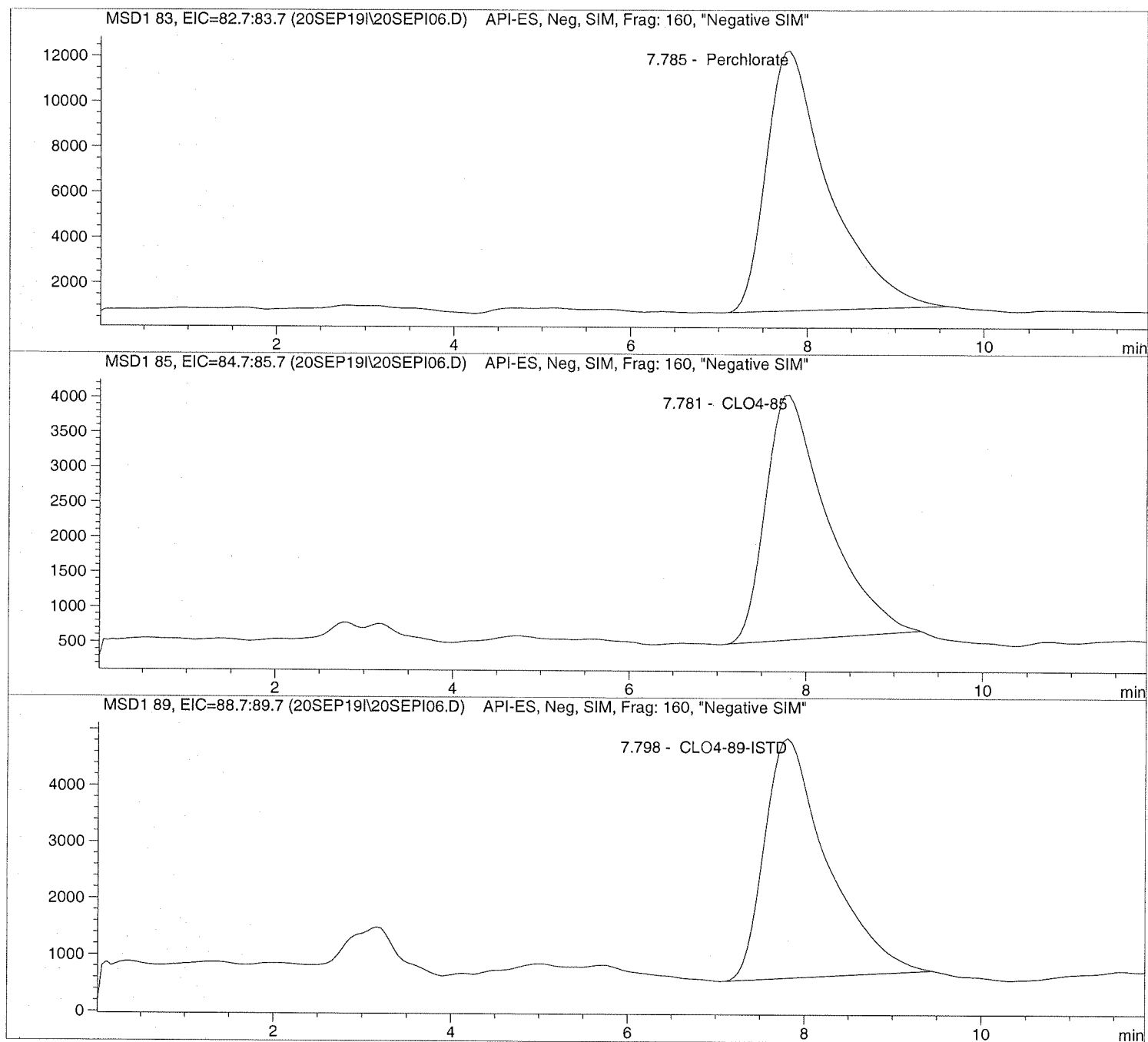
Sample Name: CLO4@ 10.ug/L

Injection Date: 9/20/2019 10:05:36
Sample Name: CLO4@ 10.ug/L
Acq Operator: TNB

Seq Line: 6
Location: Vial 76
Inj. No.: 1
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:21:47

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI06.D Sample Name: CLO4@ 10.ug/L

```

=====
Injection Date: 9/20/2019 10:05:36      Seq Line: 6
Sample Name:    CLO4@ 10.ug/L          Location:  Vial 76
Acq Operator:   TNB                    Inj. No.: 1
                                           Inj. Vol.: 30 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   9/23/2019 12:21:47
=====

```

Perchlorate analysis

Sample Information

```

=====
Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:    1.000000
Dilution:      1.000000
Sample Amount: 10.000
=====

```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.785	PBA	561297.7	9.7510	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.781	PBA	168622.4	9.5221	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.798	PBA	209246.3	5.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI07.D

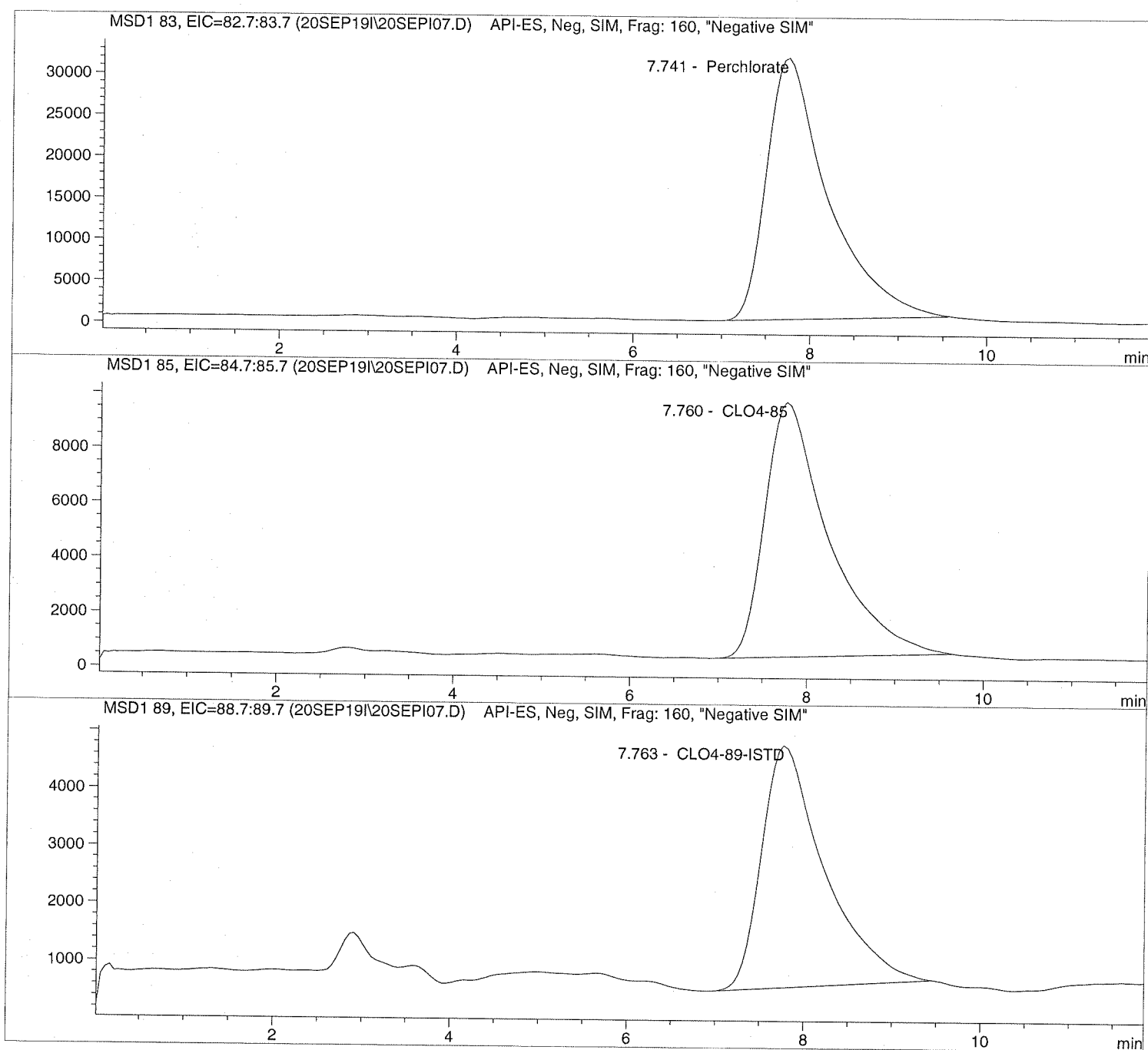
Sample Name: CLO4@ 25.ug/L

=====
Injection Date: 9/20/2019 10:19:23
Sample Name: CLO4@ 25.ug/L
Acq Operator: TNB

Seq Line: 7
Location: Vial 77
Inj. No.: 1
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:21:47

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI07.D

Sample Name: CLO4@ 25.ug/L

```

=====
Injection Date: 9/20/2019 10:19:23      Seq Line:          7
Sample Name:   CLO4@ 25.ug/L           Location:         Vial 77
Acq Operator:  TNB                     Inj. No.:        1
                                           Inj. Vol.:      30 µl
=====

```

```

Acq. Method:   CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:  9/23/2019 12:21:47
=====

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:    1.000000
Dilution:      1.000000
Sample Amount: 25.000
=====

```

```

=====
                          LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.741	PBA	1518197.9	25.0108	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.760	PBA	463724.0	25.0492	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.763	PBA	207402.8	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

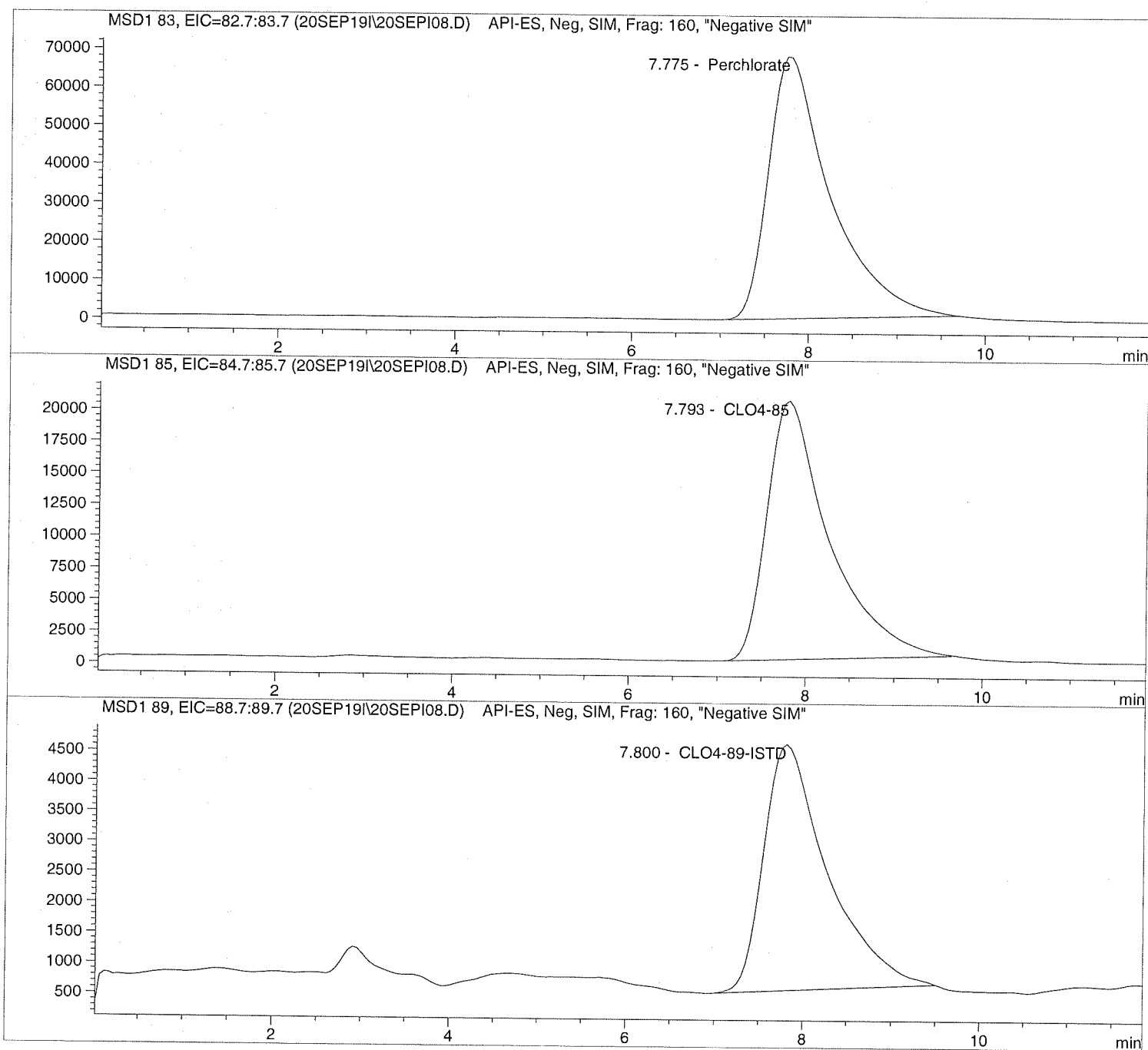
```

Data file: C:\HPCHEM\1\DATA\20SEP19\20SEPI08.D Sample Name: CLO4@ 50.ug/L

=====
Injection Date: 9/20/2019 10:33:18 Seq Line: 8
Sample Name: CLO4@ 50.ug/L Location: Vial 78
Acq Operator: TNB Inj. No.: 1
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:21:47

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI08.D

Sample Name: CLO4@ 50.ug/L

```

=====
Injection Date: 9/20/2019 10:33:18      Seq Line:      8
Sample Name:    CLO4@ 50.ug/L           Location:      Vial 78
Acq Operator:   TNB                     Inj. No.:     1
                                           Inj. Vol.:    30 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   9/23/2019 12:21:47
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  50.000
=====

```

```

=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.775	PBA	3311559.2	50.4030	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.793	PBA	995933.0	50.1422	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.800	PBA	202929.2	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI09.D

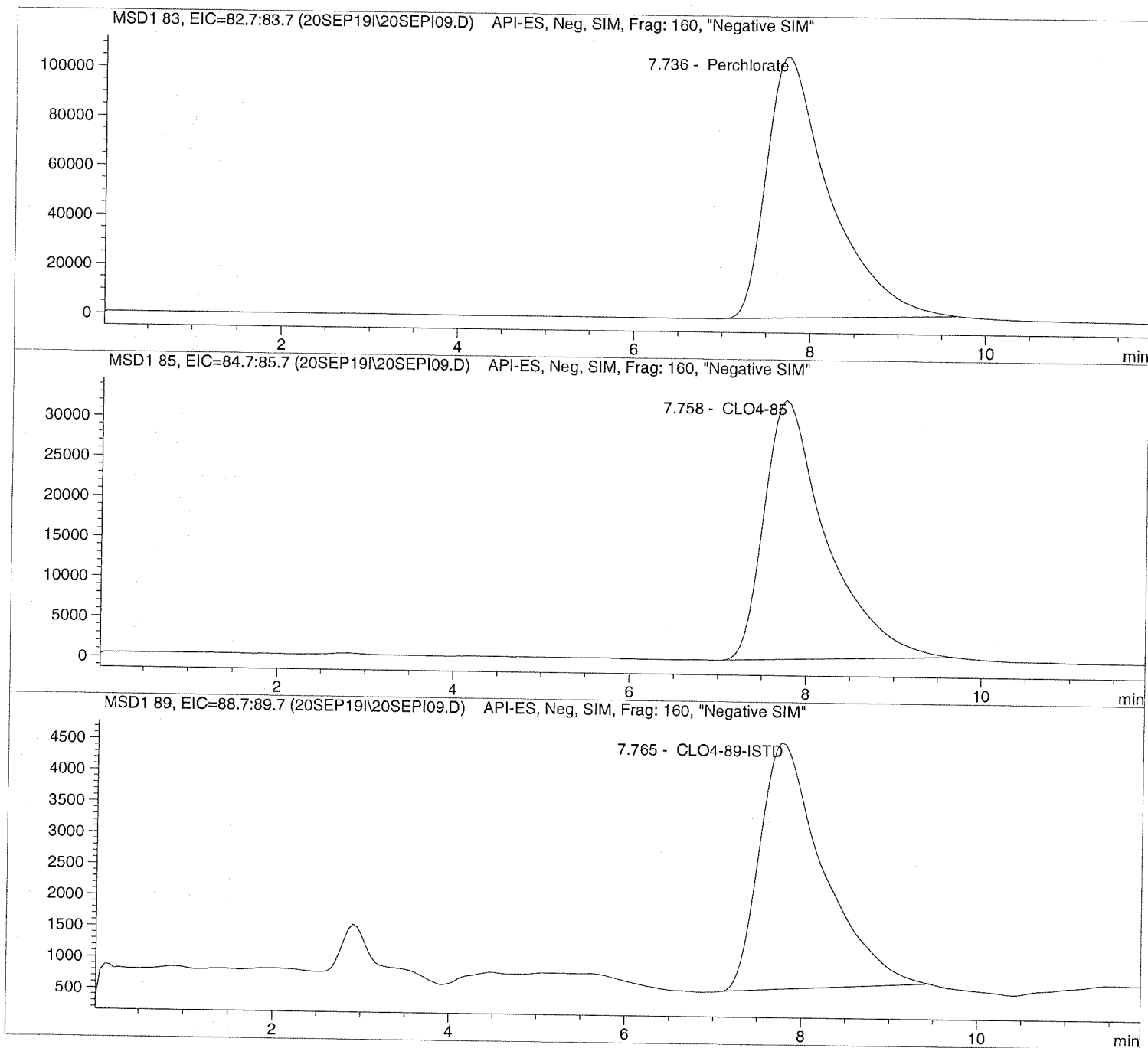
Sample Name: CLO4@ 75.ug/L

Injection Date: 9/20/2019 10:47:05
Sample Name: CLO4@ 75.ug/L
Acq Operator: TNB

Seq Line: 9
Location: Vial 79
Inj. No.: 1
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:21:47

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI09.D Sample Name: CLO4@ 75.ug/L

```

=====
Injection Date: 9/20/2019 10:47:05      Seq Line:          9
Sample Name:    CLO4@ 75.ug/L           Location:          Vial 79
Acq Operator:   TNB                     Inj. No.:         1
                                           Inj. Vol.:       30 µl
  
```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   9/23/2019 12:21:47
  
```

Perchlorate analysis

Sample Information

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:    1.000000
Dilution:      1.000000
Sample Amount: 75.000
  
```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.736	PBA	5239145.0	74.7911	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.758	PBA	1580664.2	74.9366	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.765	PBA	197932.5	5.0000	CLO4-89-ISTD

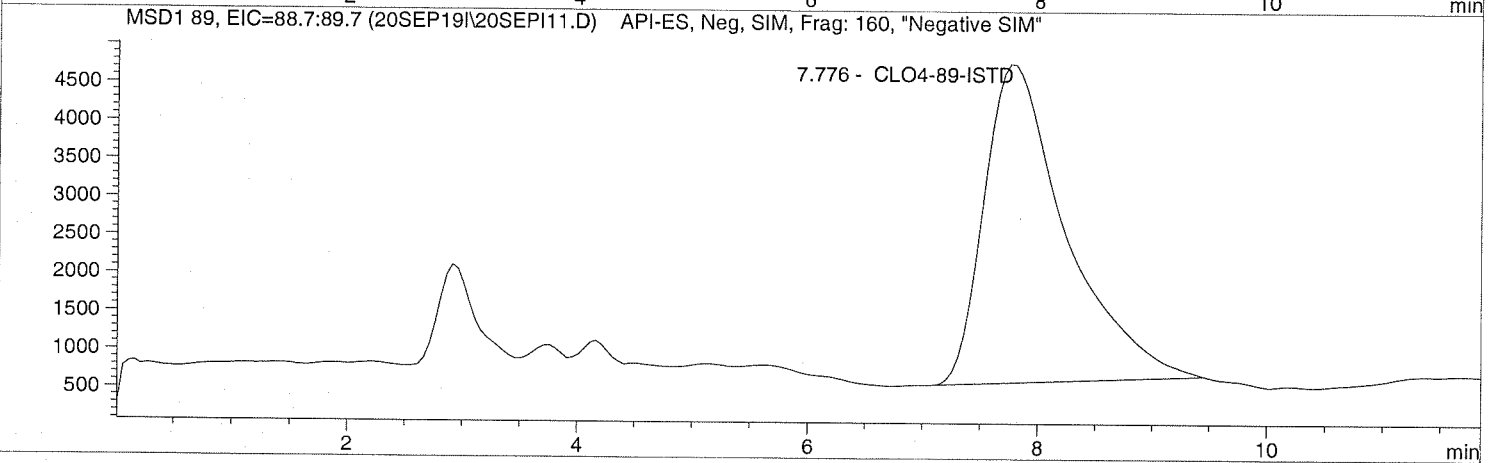
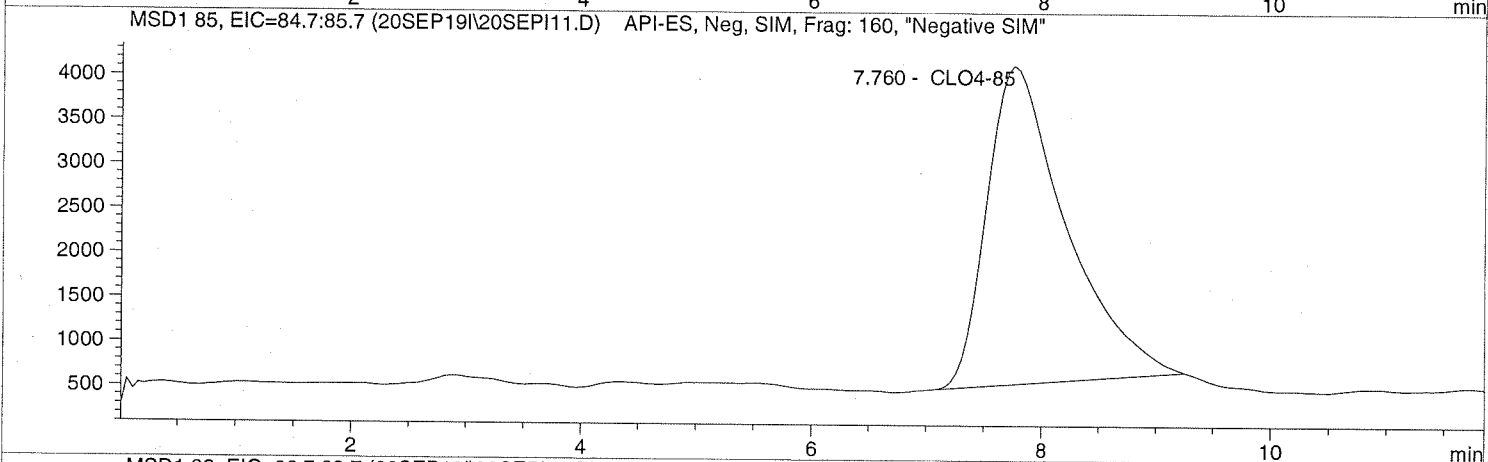
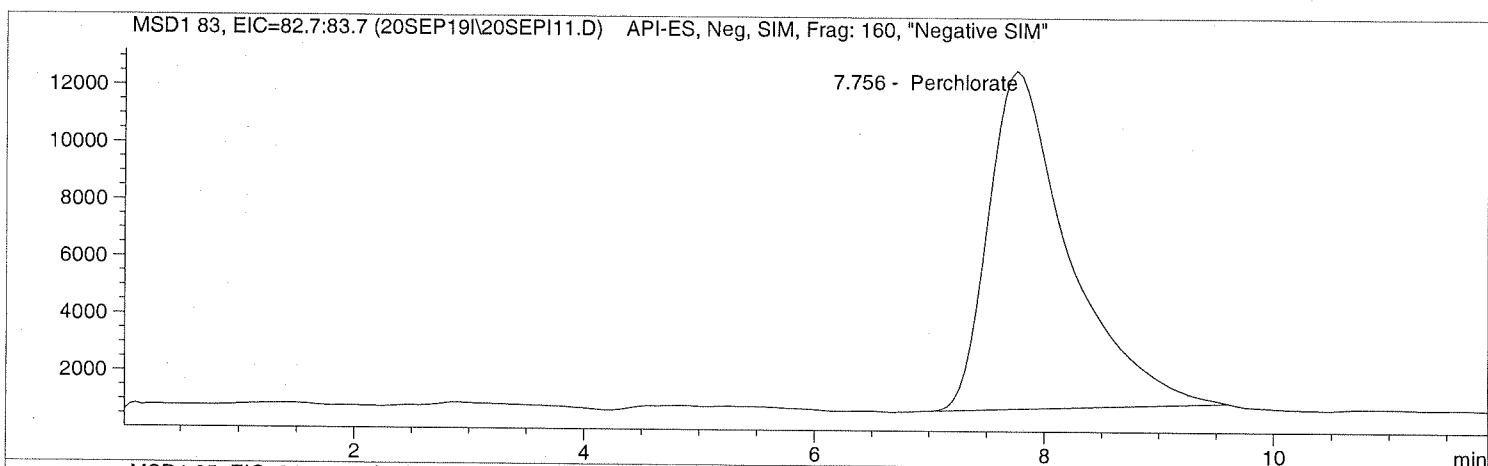
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI11.D Sample Name: ICAL Verf@10ug/L

=====
Injection Date: 9/20/2019 11:14:45 Seq Line: 11
Sample Name: ICAL Verf@10ug/L Location: Vial 80
Acq Operator: TNB Inj. No.: 1
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:21:47

Perchlorate analysis
=====



Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI11.D Sample Name: ICAL Verf@10ug/L

```

=====
Injection Date: 9/20/2019 11:14:45      Seq Line: 11
Sample Name:    ICAL Verf@10ug/L        Location:  Vial 80
Acq Operator:   TNB                      Inj. No.: 1
                                           Inj. Vol.: 30 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   9/23/2019 12:21:47
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:    1.000000
Dilution:      1.000000
Sample Amount: 10.000
=====

```

```

=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.756	PBA	574879.4	10.1185	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.760	PBA	171000.4	9.7904	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.776	PBA	206243.3	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Unmodified

Data file: C:\HPCHEM\1\DATA\20SEP19\20SEPI03.D

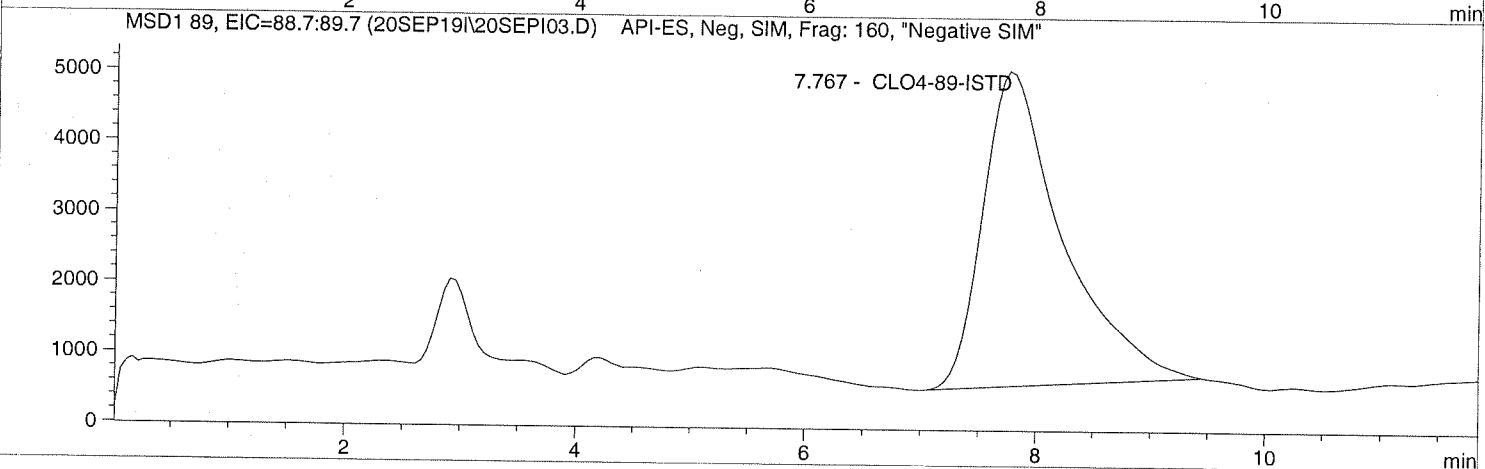
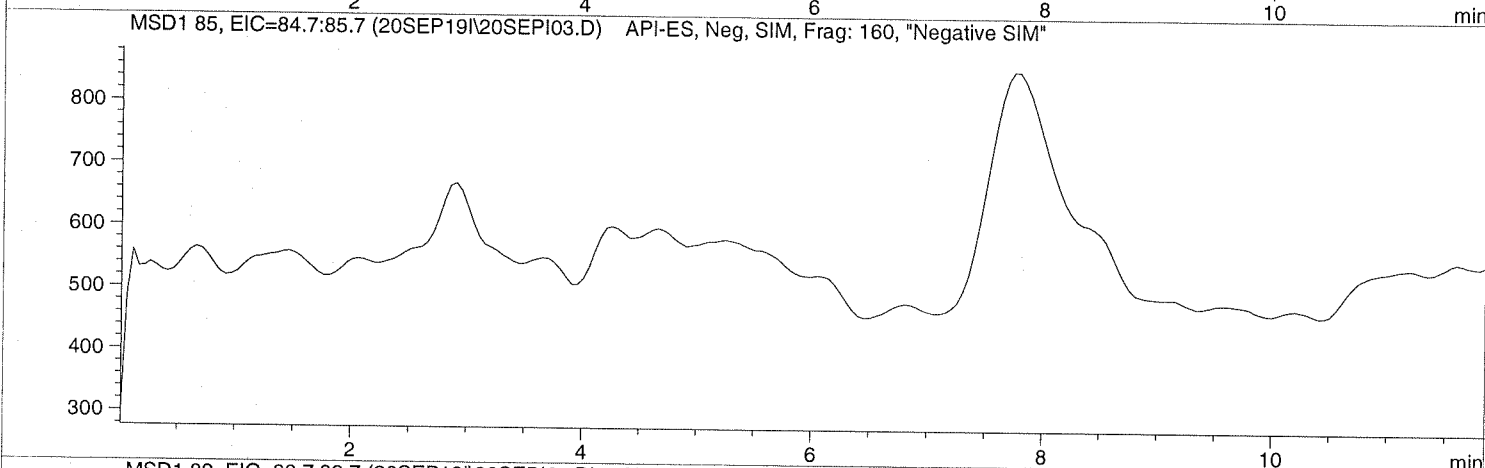
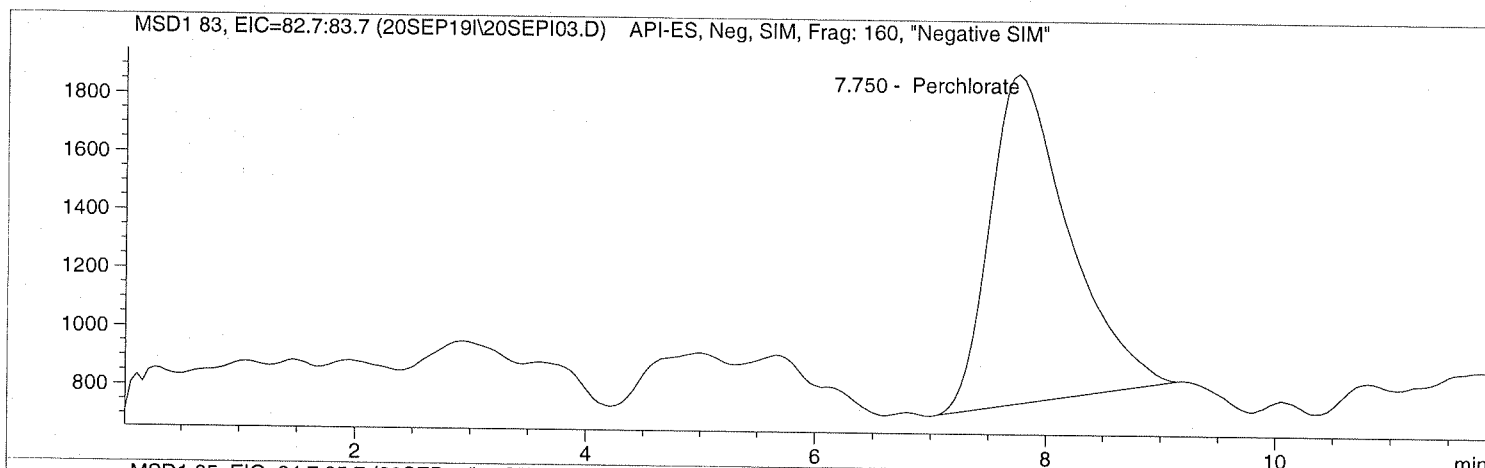
Sample Name: CLO4@ 1.0ug/L

Injection Date: 9/20/2019 09:24:05
Sample Name: CLO4@ 1.0ug/L
Acq Operator: TNB

Seq Line: 3
Location: Vial 73
Inj. No.: 1
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:27:11

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI03.D

Sample Name: CLO4@ 1.0ug/L

```

=====
Injection Date:  9/20/2019  09:24:05          Seq Line:           3
Sample Name:    CLO4@ 1.0ug/L                Location:           Vial 73
Acq Operator:   TNB                          Inj. No.:          1
                                           Inj. Vol.:         30 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   9/23/2019  12:27:11
=====

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  1.000
=====

```

```

=====
                          LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.750	PBA	53921.8	0.8760	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.767	PBA	214568.1	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\19DEC19D\19DECD17.D

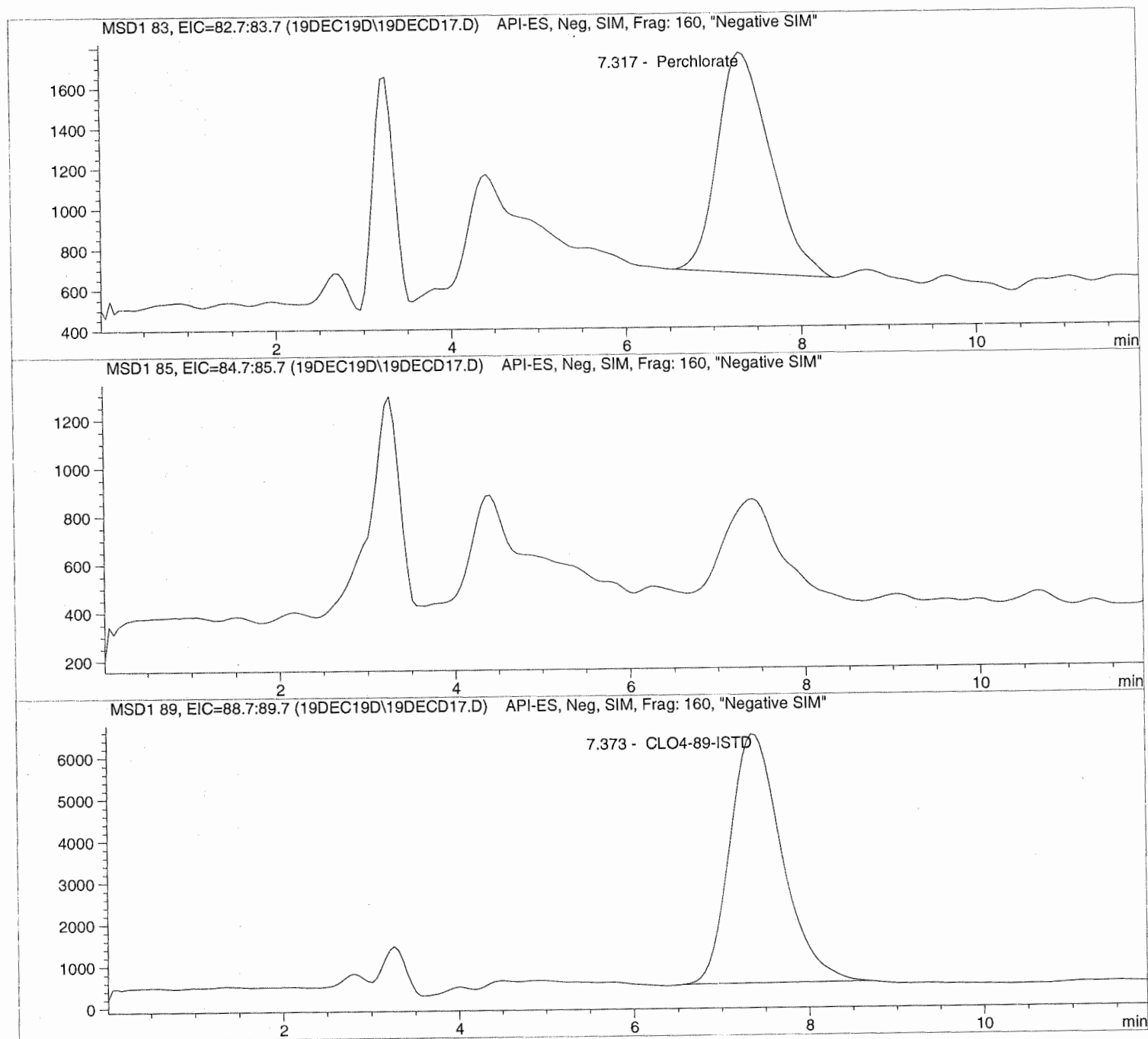
Sample Name: 1934611002

Injection Date: 12/19/2019 12:33:05
Sample Name: 1934611002
Acq Operator: TNB

Seq Line: 17
Location: Vial 86
Inj. No.: 1
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19DEC19D\19DEC17.D

Sample Name: 1934611002

```

=====
Injection Date: 12/19/2019 12:33:05      Seq Line:          17
Sample Name:   1934611002                Location:          Vial 86
Acq Operator:  TNB                       Inj. No.:         1
                                           Inj. Vol.:        35 µl
=====

```

```

Acq. Method:   CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:  11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:          Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:        1.000000
Dilution:          1.000000
Sample Amount:     0.000
=====

```

```

=====
                          LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.317	PBA	45813.6	0.6291	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.373	PBA	245674.1	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```



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

December 23, 2019

Marcia Olive
Bhate Environmental Associates, Inc.
445 Union Blvd Ste 129
Lakewood, CO 80228

Work Order: **HS19120386**

Laboratory Results for: **LHAAP 18 24**

Dear Marcia,

ALS Environmental received 6 sample(s) on Dec 07, 2019 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,

A handwritten signature in black ink, appearing to read 'Raj. P. Modashia', enclosed in a circular scribble.

Generated By: JUMOKE.LAWAL
RJ Modashia
Project Manager

ALS Houston, US

Date: 23-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Work Order: HS19120386

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19120386-01	18CptMW12SW_120619	Groundwater		06-Dec-2019 07:50	07-Dec-2019 09:00	<input type="checkbox"/>
HS19120386-02	18CpTMW12DW_120619	Groundwater		06-Dec-2019 08:40	07-Dec-2019 09:00	<input type="checkbox"/>
HS19120386-03	MW7_120619	Groundwater		06-Dec-2019 09:30	07-Dec-2019 09:00	<input type="checkbox"/>
HS19120386-04	18CpTMW10SW_120619	Groundwater		06-Dec-2019 10:25	07-Dec-2019 09:00	<input type="checkbox"/>
HS19120386-05	18CpTMW10DW_120619	Groundwater		06-Dec-2019 11:10	07-Dec-2019 09:00	<input type="checkbox"/>
HS19120386-06	18ww17_120619	Groundwater		06-Dec-2019 11:25	07-Dec-2019 09:00	<input type="checkbox"/>

ALS Houston, US

Date: 23-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Work Order: HS19120386

CASE NARRATIVE

Work Order Comments

- The analysis for Perchlorate was subcontracted to ALS Salt Lake City, UT. Final report attached.

GCMS Semivolatiles by Method SW8270SIM**Batch ID: 148468****Sample ID: MW7_120619 (HS19120386-03)**

- The surrogate recoveries could not be determined due to dilution below the calibration range.

GCMS Volatiles by Method SW8260**Batch ID: R352218****Sample ID: CCV**

- 1,2,3-Trichlorobenzene exceeded %D limits for CCV. Samples are ND for this compound.

Sample ID: 18CptMW12SW_120619 (HS19120386-01MS)

- MS/MSD and RPD failed QC for some compounds

Metals by Method SW7470**Batch ID: 148663**

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

Metals by Method SW6020**Batch ID: 148640****Sample ID: 18CptMW12SW_120619 (HS19120386-01MS)**

- Aluminum failed for MS/MSD but passed for PDS.

Sample ID: 18CptMW12SW_120619 (HS19120386-01MSD)

- The MS and/or MSD recovery was outside of the control; however, the result in the parent sample is greater than 4x the spike amount. Barium, Calcium, Magnesium, Manganese, Potassium and Sodium.

Sample ID: 18CptMW12SW_120619 (HS19120386-01PDS)

- The PDS recovery was outside method control limits, however the result in the parent sample is greater than 4x the spike amount. Barium, Calcium and Potassium
 - The PDS recovery was outside method control limits, however the result in the parent sample is greater than 4x the spike amount. Sodium
-

ALS Houston, US

Date: 23-Dec-19

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP 18 24
 Sample ID: 18CptMW12SW_120619
 Collection Date: 06-Dec-2019 07:50

ANALYTICAL REPORT

WorkOrder:HS19120386
 Lab ID:HS19120386-01
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD		Method:SW8260						
8260C								Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 14:51
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Dec-2019 14:51
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	10-Dec-2019 14:51
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 14:51
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Dec-2019 14:51
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Dec-2019 14:51
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 14:51
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Dec-2019 14:51
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	10-Dec-2019 14:51
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	10-Dec-2019 14:51
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 14:51
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Dec-2019 14:51
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Dec-2019 14:51
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	10-Dec-2019 14:51
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Dec-2019 14:51
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	10-Dec-2019 14:51
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 14:51
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Dec-2019 14:51
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 14:51
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Dec-2019 14:51
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Dec-2019 14:51
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	10-Dec-2019 14:51
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 14:51
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	10-Dec-2019 14:51
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Dec-2019 14:51
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 14:51
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	10-Dec-2019 14:51
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	10-Dec-2019 14:51
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Dec-2019 14:51
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Dec-2019 14:51
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Dec-2019 14:51
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Dec-2019 14:51
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	10-Dec-2019 14:51
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	10-Dec-2019 14:51
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	10-Dec-2019 14:51
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	10-Dec-2019 14:51
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 14:51
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 14:51
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	10-Dec-2019 14:51

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

ALS Houston, US

Date: 23-Dec-19

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP 18 24
 Sample ID: 18CptMW12SW_120619
 Collection Date: 06-Dec-2019 07:50

ANALYTICAL REPORT
 WorkOrder:HS19120386
 Lab ID:HS19120386-01
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED	
VOLATILES ORGANICS BY METHOD 8260C		Method:SW8260						Analyst: PC	
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Dec-2019 14:51	
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Dec-2019 14:51	
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	10-Dec-2019 14:51	
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 14:51	
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Dec-2019 14:51	
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 14:51	
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 14:51	
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	UG/L	1	10-Dec-2019 14:51	
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 14:51	
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	10-Dec-2019 14:51	
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	10-Dec-2019 14:51	
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Dec-2019 14:51	
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 14:51	
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 14:51	
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 14:51	
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 14:51	
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 14:51	
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 14:51	
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 14:51	
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Dec-2019 14:51	
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Dec-2019 14:51	
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Dec-2019 14:51	
Trichloroethene	1.3		0.20	0.50	1.0	UG/L	1	10-Dec-2019 14:51	
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 14:51	
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	10-Dec-2019 14:51	
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>92.4</i>			0	<i>81-118</i>	%REC	1	10-Dec-2019 14:51	
<i>Surr: 4-Bromofluorobenzene</i>	<i>98.4</i>			0	<i>85-114</i>	%REC	1	10-Dec-2019 14:51	
<i>Surr: Dibromofluoromethane</i>	<i>94.0</i>			0	<i>80-119</i>	%REC	1	10-Dec-2019 14:51	
<i>Surr: Toluene-d8</i>	<i>102</i>			0	<i>89-112</i>	%REC	1	10-Dec-2019 14:51	
SEMIVOLATILES SIM		Method:SW8270SIM				Prep:SW3510 / 10-Dec-2019		Analyst: LG	
1,4-Dioxane	0.14		0.010	0.010	0.010	ug/L	1	16-Dec-2019 09:06	
<i>Surr: 2-Fluorobiphenyl</i>	<i>128</i>			0	<i>40-140</i>	%REC	1	16-Dec-2019 09:06	
<i>Surr: 4-Terphenyl-d14</i>	<i>114</i>			0	<i>40-140</i>	%REC	1	16-Dec-2019 09:06	
<i>Surr: Nitrobenzene-d5</i>	<i>102</i>			0	<i>40-140</i>	%REC	1	16-Dec-2019 09:06	

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

ALS Houston, US

Date: 23-Dec-19

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP 18 24
 Sample ID: 18CptMW12SW_120619
 Collection Date: 06-Dec-2019 07:50

ANALYTICAL REPORT
 WorkOrder:HS19120386
 Lab ID:HS19120386-01
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A			Method:SW6020			Prep:SW3010A / 13-Dec-2019		Analyst: JHD
Aluminum	0.0145	J	0.00360	0.0100	0.0200	mg/L	2	18-Dec-2019 15:32
Antimony	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	17-Dec-2019 11:16
Arsenic	0.000792	J	0.000400	0.000500	0.00500	mg/L	1	17-Dec-2019 11:16
Barium	0.815		0.00190	0.00250	0.00500	mg/L	1	17-Dec-2019 11:16
Beryllium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	17-Dec-2019 11:16
Cadmium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	17-Dec-2019 11:16
Calcium	63.3		0.0340	0.0500	0.500	mg/L	1	17-Dec-2019 11:16
Chromium	0.00725		0.000400	0.000500	0.00500	mg/L	1	17-Dec-2019 11:16
Cobalt	0.00232	J	0.000100	0.000500	0.00500	mg/L	1	17-Dec-2019 11:16
Copper	0.00250	U	0.00100	0.00250	0.00500	mg/L	1	17-Dec-2019 11:16
Iron	0.776		0.0120	0.0500	0.200	mg/L	1	17-Dec-2019 11:16
Lead	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	17-Dec-2019 11:16
Magnesium	35.2		0.100	0.500	2.00	mg/L	10	17-Dec-2019 12:26
Manganese	0.379		0.00700	0.0250	0.0500	mg/L	10	17-Dec-2019 12:26
Nickel	0.00624		0.000600	0.00100	0.00500	mg/L	1	17-Dec-2019 11:16
Potassium	41.3		0.0180	0.0500	0.200	mg/L	1	17-Dec-2019 11:16
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	17-Dec-2019 11:16
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	17-Dec-2019 11:16
Sodium	232		0.140	0.500	2.00	mg/L	10	17-Dec-2019 12:26
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	17-Dec-2019 11:16
Vanadium	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	17-Dec-2019 11:16
Zinc	0.0122		0.00200	0.00250	0.00500	mg/L	1	17-Dec-2019 11:16
MERCURY BY SW7470A			Method:SW7470			Prep:SW7470 / 13-Dec-2019		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	13-Dec-2019 15:35
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)			Method:NA			Analyst: SUB		
Subcontract Analysis	See Attached		0	0		NA	1	23-Dec-2019 17:05

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

ALS Houston, US

Date: 23-Dec-19

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP 18 24
 Sample ID: 18CpTMW12DW_120619
 Collection Date: 06-Dec-2019 08:40

ANALYTICAL REPORT
 WorkOrder:HS19120386
 Lab ID:HS19120386-02
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED	
VOLATILES ORGANICS BY METHOD 8260C		Method:SW8260							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 15:15	
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Dec-2019 15:15	
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	10-Dec-2019 15:15	
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 15:15	
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Dec-2019 15:15	
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Dec-2019 15:15	
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 15:15	
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Dec-2019 15:15	
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	10-Dec-2019 15:15	
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	10-Dec-2019 15:15	
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 15:15	
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Dec-2019 15:15	
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Dec-2019 15:15	
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	10-Dec-2019 15:15	
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Dec-2019 15:15	
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	10-Dec-2019 15:15	
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 15:15	
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Dec-2019 15:15	
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 15:15	
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Dec-2019 15:15	
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Dec-2019 15:15	
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	10-Dec-2019 15:15	
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 15:15	
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	10-Dec-2019 15:15	
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Dec-2019 15:15	
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 15:15	
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	10-Dec-2019 15:15	
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	10-Dec-2019 15:15	
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Dec-2019 15:15	
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Dec-2019 15:15	
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Dec-2019 15:15	
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Dec-2019 15:15	
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	10-Dec-2019 15:15	
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	10-Dec-2019 15:15	
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	10-Dec-2019 15:15	
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	10-Dec-2019 15:15	
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 15:15	
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 15:15	
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	10-Dec-2019 15:15	

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

ALS Houston, US

Date: 23-Dec-19

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP 18 24
 Sample ID: 18CpTMW12DW_120619
 Collection Date: 06-Dec-2019 08:40

ANALYTICAL REPORT
 WorkOrder:HS19120386
 Lab ID:HS19120386-02
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED	
VOLATILES ORGANICS BY METHOD 8260C		Method:SW8260						Analyst: PC	
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Dec-2019 15:15	
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Dec-2019 15:15	
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	10-Dec-2019 15:15	
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 15:15	
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Dec-2019 15:15	
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 15:15	
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 15:15	
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	UG/L	1	10-Dec-2019 15:15	
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 15:15	
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	10-Dec-2019 15:15	
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	10-Dec-2019 15:15	
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Dec-2019 15:15	
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 15:15	
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 15:15	
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 15:15	
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 15:15	
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 15:15	
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 15:15	
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 15:15	
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Dec-2019 15:15	
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Dec-2019 15:15	
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Dec-2019 15:15	
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Dec-2019 15:15	
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 15:15	
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	10-Dec-2019 15:15	
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>92.6</i>			0	<i>81-118</i>	%REC	<i>1</i>	<i>10-Dec-2019 15:15</i>	
<i>Surr: 4-Bromofluorobenzene</i>	<i>99.3</i>			0	<i>85-114</i>	%REC	<i>1</i>	<i>10-Dec-2019 15:15</i>	
<i>Surr: Dibromofluoromethane</i>	<i>94.1</i>			0	<i>80-119</i>	%REC	<i>1</i>	<i>10-Dec-2019 15:15</i>	
<i>Surr: Toluene-d8</i>	<i>101</i>			0	<i>89-112</i>	%REC	<i>1</i>	<i>10-Dec-2019 15:15</i>	
SEMIVOLATILES SIM		Method:SW8270SIM				Prep:SW3510 / 10-Dec-2019		Analyst: LG	
1,4-Dioxane	0.36		0.010	0.010	0.010	ug/L	1	16-Dec-2019 09:25	
<i>Surr: 2-Fluorobiphenyl</i>	<i>113</i>			0	<i>40-140</i>	%REC	<i>1</i>	<i>16-Dec-2019 09:25</i>	
<i>Surr: 4-Terphenyl-d14</i>	<i>98.1</i>			0	<i>40-140</i>	%REC	<i>1</i>	<i>16-Dec-2019 09:25</i>	
<i>Surr: Nitrobenzene-d5</i>	<i>120</i>			0	<i>40-140</i>	%REC	<i>1</i>	<i>16-Dec-2019 09:25</i>	

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

ALS Houston, US

Date: 23-Dec-19

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP 18 24
 Sample ID: 18CpTMW12DW_120619
 Collection Date: 06-Dec-2019 08:40

ANALYTICAL REPORT
 WorkOrder:HS19120386
 Lab ID:HS19120386-02
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A			Method:SW6020			Prep:SW3010A / 13-Dec-2019		Analyst: JHD
Aluminum	0.0121		0.00180	0.00500	0.0100	mg/L	1	17-Dec-2019 11:04
Antimony	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	17-Dec-2019 11:04
Arsenic	0.00304	J	0.000400	0.000500	0.00500	mg/L	1	17-Dec-2019 11:04
Barium	0.0892		0.00190	0.00250	0.00500	mg/L	1	17-Dec-2019 11:04
Beryllium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	17-Dec-2019 11:04
Cadmium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	17-Dec-2019 11:04
Calcium	6.13		0.0340	0.0500	0.500	mg/L	1	17-Dec-2019 11:04
Chromium	0.00294	J	0.000400	0.000500	0.00500	mg/L	1	17-Dec-2019 11:04
Cobalt	0.000500	U	0.000100	0.000500	0.00500	mg/L	1	17-Dec-2019 11:04
Copper	0.00250	U	0.00100	0.00250	0.00500	mg/L	1	17-Dec-2019 11:04
Iron	0.873		0.0120	0.0500	0.200	mg/L	1	17-Dec-2019 11:04
Lead	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	17-Dec-2019 11:04
Magnesium	3.74		0.0100	0.0500	0.200	mg/L	1	17-Dec-2019 11:04
Manganese	0.0237		0.000700	0.00250	0.00500	mg/L	1	17-Dec-2019 11:04
Nickel	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	17-Dec-2019 11:04
Potassium	70.8		0.0180	0.0500	0.200	mg/L	1	17-Dec-2019 11:04
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	17-Dec-2019 11:04
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	17-Dec-2019 11:04
Sodium	163		0.0140	0.0500	0.200	mg/L	1	17-Dec-2019 11:04
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	17-Dec-2019 11:04
Vanadium	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	17-Dec-2019 11:04
Zinc	0.00250	U	0.00200	0.00250	0.00500	mg/L	1	17-Dec-2019 11:04
MERCURY BY SW7470A			Method:SW7470			Prep:SW7470 / 13-Dec-2019		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	13-Dec-2019 15:37
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)			Method:NA			Analyst: SUB		
Subcontract Analysis	See Attached		0	0		NA	1	23-Dec-2019 17:05

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

ALS Houston, US

Date: 23-Dec-19

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP 18 24
 Sample ID: MW7_120619
 Collection Date: 06-Dec-2019 09:30

ANALYTICAL REPORT
 WorkOrder:HS19120386
 Lab ID:HS19120386-03
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED	
VOLATILES ORGANICS BY METHOD 8260C		Method:SW8260							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 16:03	
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Dec-2019 16:03	
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	10-Dec-2019 16:03	
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 16:03	
1,1-Dichloroethane	0.49	J	0.20	0.50	1.0	UG/L	1	10-Dec-2019 16:03	
1,1-Dichloroethene	14		0.20	0.50	1.0	UG/L	1	10-Dec-2019 16:03	
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 16:03	
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Dec-2019 16:03	
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	10-Dec-2019 16:03	
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	10-Dec-2019 16:03	
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 16:03	
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Dec-2019 16:03	
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Dec-2019 16:03	
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	10-Dec-2019 16:03	
1,2-Dichloroethane	30		0.20	0.50	1.0	UG/L	1	10-Dec-2019 16:03	
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	10-Dec-2019 16:03	
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 16:03	
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Dec-2019 16:03	
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 16:03	
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Dec-2019 16:03	
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Dec-2019 16:03	
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	10-Dec-2019 16:03	
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 16:03	
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	10-Dec-2019 16:03	
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Dec-2019 16:03	
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 16:03	
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	10-Dec-2019 16:03	
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	10-Dec-2019 16:03	
Benzene	6.3		0.20	0.50	1.0	UG/L	1	10-Dec-2019 16:03	
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Dec-2019 16:03	
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Dec-2019 16:03	
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Dec-2019 16:03	
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	10-Dec-2019 16:03	
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	10-Dec-2019 16:03	
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	10-Dec-2019 16:03	
Carbon tetrachloride	6.0		0.50	0.50	1.0	UG/L	1	10-Dec-2019 16:03	
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 16:03	
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 16:03	
Chloroform	19		0.20	0.50	1.0	UG/L	1	10-Dec-2019 16:03	

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

ALS Houston, US

Date: 23-Dec-19

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP 18 24
 Sample ID: MW7_120619
 Collection Date: 06-Dec-2019 09:30

ANALYTICAL REPORT

WorkOrder:HS19120386
 Lab ID:HS19120386-03
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED		
VOLATILES ORGANICS BY METHOD 8260C		Method:SW8260							Analyst: PC	
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Dec-2019 16:03		
cis-1,2-Dichloroethene	28		0.20	0.50	1.0	UG/L	1	10-Dec-2019 16:03		
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	10-Dec-2019 16:03		
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 16:03		
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Dec-2019 16:03		
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 16:03		
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 16:03		
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	UG/L	1	10-Dec-2019 16:03		
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 16:03		
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	10-Dec-2019 16:03		
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	10-Dec-2019 16:03		
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Dec-2019 16:03		
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 16:03		
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 16:03		
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 16:03		
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 16:03		
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 16:03		
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 16:03		
Tetrachloroethene	0.75	J	0.30	0.50	1.0	UG/L	1	10-Dec-2019 16:03		
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Dec-2019 16:03		
trans-1,2-Dichloroethene	0.46	J	0.20	0.50	1.0	UG/L	1	10-Dec-2019 16:03		
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Dec-2019 16:03		
Trichloroethene	3,200		10	25	50	UG/L	50	10-Dec-2019 17:15		
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 16:03		
Vinyl chloride	1.8		0.20	0.50	1.0	UG/L	1	10-Dec-2019 16:03		
Surr: 1,2-Dichloroethane-d4	92.4			0	81-118	%REC	1	10-Dec-2019 16:03		
Surr: 1,2-Dichloroethane-d4	93.3			0	81-118	%REC	50	10-Dec-2019 17:15		
Surr: 4-Bromofluorobenzene	100			0	85-114	%REC	1	10-Dec-2019 16:03		
Surr: 4-Bromofluorobenzene	100			0	85-114	%REC	50	10-Dec-2019 17:15		
Surr: Dibromofluoromethane	94.0			0	80-119	%REC	1	10-Dec-2019 16:03		
Surr: Dibromofluoromethane	94.2			0	80-119	%REC	50	10-Dec-2019 17:15		
Surr: Toluene-d8	100			0	89-112	%REC	1	10-Dec-2019 16:03		
Surr: Toluene-d8	101			0	89-112	%REC	50	10-Dec-2019 17:15		
SEMIVOLATILES SIM		Method:SW8270SIM							Prep:SW3510 / 10-Dec-2019	Analyst: LG
1,4-Dioxane	42		1.0	1.0	1.0	ug/L	100	16-Dec-2019 14:05		
Surr: 2-Fluorobiphenyl	0	S		0	40-140	%REC	100	16-Dec-2019 14:05		
Surr: 4-Terphenyl-d14	0	S		0	40-140	%REC	100	16-Dec-2019 14:05		
Surr: Nitrobenzene-d5	0	S		0	40-140	%REC	100	16-Dec-2019 14:05		

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

ALS Houston, US

Date: 23-Dec-19

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP 18 24
 Sample ID: MW7_120619
 Collection Date: 06-Dec-2019 09:30

ANALYTICAL REPORT

WorkOrder:HS19120386
 Lab ID:HS19120386-03
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		Method:NA		Analyst: SUB				
Subcontract Analysis	See Attached		0	0		NA	1	23-Dec-2019 17:05

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

ALS Houston, US

Date: 23-Dec-19

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP 18 24
 Sample ID: 18CpTMW10SW_120619
 Collection Date: 06-Dec-2019 10:25

ANALYTICAL REPORT

WorkOrder:HS19120386
 Lab ID:HS19120386-04
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD		Method:SW8260						
8260C								Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 18:51
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Dec-2019 18:51
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	10-Dec-2019 18:51
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 18:51
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Dec-2019 18:51
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Dec-2019 18:51
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 18:51
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Dec-2019 18:51
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	10-Dec-2019 18:51
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	10-Dec-2019 18:51
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 18:51
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Dec-2019 18:51
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Dec-2019 18:51
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	10-Dec-2019 18:51
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Dec-2019 18:51
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	10-Dec-2019 18:51
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 18:51
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Dec-2019 18:51
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 18:51
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Dec-2019 18:51
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Dec-2019 18:51
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	10-Dec-2019 18:51
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 18:51
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	10-Dec-2019 18:51
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Dec-2019 18:51
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 18:51
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	10-Dec-2019 18:51
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	10-Dec-2019 18:51
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Dec-2019 18:51
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Dec-2019 18:51
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Dec-2019 18:51
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Dec-2019 18:51
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	10-Dec-2019 18:51
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	10-Dec-2019 18:51
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	10-Dec-2019 18:51
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	10-Dec-2019 18:51
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 18:51
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 18:51
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	10-Dec-2019 18:51

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

ALS Houston, US

Date: 23-Dec-19

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP 18 24
 Sample ID: 18CpTMW10SW_120619
 Collection Date: 06-Dec-2019 10:25

ANALYTICAL REPORT
 WorkOrder:HS19120386
 Lab ID:HS19120386-04
 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	10-Dec-2019 18:51	
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Dec-2019 18:51	
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	10-Dec-2019 18:51	
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 18:51	
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Dec-2019 18:51	
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 18:51	
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 18:51	
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	UG/L	1	10-Dec-2019 18:51	
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 18:51	
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	10-Dec-2019 18:51	
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	10-Dec-2019 18:51	
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Dec-2019 18:51	
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 18:51	
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 18:51	
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 18:51	
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 18:51	
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 18:51	
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 18:51	
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 18:51	
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Dec-2019 18:51	
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Dec-2019 18:51	
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Dec-2019 18:51	
Trichloroethene	0.92	J	0.20	0.50	1.0	UG/L	1	10-Dec-2019 18:51	
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 18:51	
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	10-Dec-2019 18:51	
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>95.0</i>			0	<i>81-118</i>	%REC	1	<i>10-Dec-2019 18:51</i>	
<i>Surr: 4-Bromofluorobenzene</i>	<i>98.5</i>			0	<i>85-114</i>	%REC	1	<i>10-Dec-2019 18:51</i>	
<i>Surr: Dibromofluoromethane</i>	<i>95.2</i>			0	<i>80-119</i>	%REC	1	<i>10-Dec-2019 18:51</i>	
<i>Surr: Toluene-d8</i>	<i>103</i>			0	<i>89-112</i>	%REC	1	<i>10-Dec-2019 18:51</i>	
SEMIVOLATILES SIM		Method:SW8270SIM				Prep:SW3510 / 10-Dec-2019		Analyst: LG	
1,4-Dioxane	0.010	U	0.010	0.010	0.010	ug/L	1	16-Dec-2019 10:03	
<i>Surr: 2-Fluorobiphenyl</i>	<i>122</i>			0	<i>40-140</i>	%REC	1	<i>16-Dec-2019 10:03</i>	
<i>Surr: 4-Terphenyl-d14</i>	<i>91.8</i>			0	<i>40-140</i>	%REC	1	<i>16-Dec-2019 10:03</i>	
<i>Surr: Nitrobenzene-d5</i>	<i>110</i>			0	<i>40-140</i>	%REC	1	<i>16-Dec-2019 10:03</i>	
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		Method:NA						Analyst: SUB	
Subcontract Analysis	See Attached		0	0		NA	1	23-Dec-2019 17:05	

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

ALS Houston, US

Date: 23-Dec-19

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP 18 24
 Sample ID: 18CpTMW10DW_120619
 Collection Date: 06-Dec-2019 11:10

ANALYTICAL REPORT
 WorkOrder:HS19120386
 Lab ID:HS19120386-05
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED	
VOLATILES ORGANICS BY METHOD		Method:SW8260							Analyst: PC
8260C									
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 19:15	
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Dec-2019 19:15	
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	10-Dec-2019 19:15	
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 19:15	
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Dec-2019 19:15	
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Dec-2019 19:15	
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 19:15	
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Dec-2019 19:15	
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	10-Dec-2019 19:15	
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	10-Dec-2019 19:15	
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 19:15	
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Dec-2019 19:15	
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Dec-2019 19:15	
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	10-Dec-2019 19:15	
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Dec-2019 19:15	
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	10-Dec-2019 19:15	
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 19:15	
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Dec-2019 19:15	
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 19:15	
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Dec-2019 19:15	
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Dec-2019 19:15	
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	10-Dec-2019 19:15	
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 19:15	
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	10-Dec-2019 19:15	
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Dec-2019 19:15	
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 19:15	
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	10-Dec-2019 19:15	
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	10-Dec-2019 19:15	
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Dec-2019 19:15	
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Dec-2019 19:15	
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Dec-2019 19:15	
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Dec-2019 19:15	
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	10-Dec-2019 19:15	
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	10-Dec-2019 19:15	
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	10-Dec-2019 19:15	
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	10-Dec-2019 19:15	
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 19:15	
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 19:15	
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	10-Dec-2019 19:15	

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

ALS Houston, US

Date: 23-Dec-19

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP 18 24
 Sample ID: 18CpTMW10DW_120619
 Collection Date: 06-Dec-2019 11:10

ANALYTICAL REPORT
 WorkOrder:HS19120386
 Lab ID:HS19120386-05
 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	10-Dec-2019 19:15	
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Dec-2019 19:15	
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	10-Dec-2019 19:15	
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 19:15	
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Dec-2019 19:15	
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 19:15	
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 19:15	
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	UG/L	1	10-Dec-2019 19:15	
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 19:15	
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	10-Dec-2019 19:15	
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	10-Dec-2019 19:15	
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Dec-2019 19:15	
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 19:15	
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 19:15	
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 19:15	
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 19:15	
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 19:15	
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 19:15	
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 19:15	
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Dec-2019 19:15	
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Dec-2019 19:15	
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Dec-2019 19:15	
Trichloroethene	1.4		0.20	0.50	1.0	UG/L	1	10-Dec-2019 19:15	
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 19:15	
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	10-Dec-2019 19:15	
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>93.0</i>			0	<i>81-118</i>	%REC	1	10-Dec-2019 19:15	
<i>Surr: 4-Bromofluorobenzene</i>	<i>100</i>			0	<i>85-114</i>	%REC	1	10-Dec-2019 19:15	
<i>Surr: Dibromofluoromethane</i>	<i>94.2</i>			0	<i>80-119</i>	%REC	1	10-Dec-2019 19:15	
<i>Surr: Toluene-d8</i>	<i>101</i>			0	<i>89-112</i>	%REC	1	10-Dec-2019 19:15	

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

ALS Houston, US

Date: 23-Dec-19

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP 18 24
 Sample ID: 18CpTMW10DW_120619
 Collection Date: 06-Dec-2019 11:10

ANALYTICAL REPORT

WorkOrder:HS19120386
 Lab ID:HS19120386-05
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A		Method:SW6020				Prep:SW3010A / 13-Dec-2019		Analyst: JHD
Aluminum	0.0297		0.00180	0.00500	0.0100	mg/L	1	17-Dec-2019 11:06
Antimony	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	17-Dec-2019 11:06
Arsenic	0.00194	J	0.000400	0.000500	0.00500	mg/L	1	17-Dec-2019 11:06
Barium	0.124		0.00190	0.00250	0.00500	mg/L	1	17-Dec-2019 11:06
Beryllium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	17-Dec-2019 11:06
Cadmium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	17-Dec-2019 11:06
Calcium	10.5		0.0340	0.0500	0.500	mg/L	1	17-Dec-2019 11:06
Chromium	0.00929		0.000400	0.000500	0.00500	mg/L	1	17-Dec-2019 11:06
Cobalt	0.000146	J	0.000100	0.000500	0.00500	mg/L	1	17-Dec-2019 11:06
Copper	0.00250	U	0.00100	0.00250	0.00500	mg/L	1	17-Dec-2019 11:06
Iron	1.23		0.0120	0.0500	0.200	mg/L	1	17-Dec-2019 11:06
Lead	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	17-Dec-2019 11:06
Magnesium	4.55		0.0100	0.0500	0.200	mg/L	1	17-Dec-2019 11:06
Manganese	0.0295		0.000700	0.00250	0.00500	mg/L	1	17-Dec-2019 11:06
Nickel	0.00120	J	0.000600	0.00100	0.00500	mg/L	1	17-Dec-2019 11:06
Potassium	85.7		0.0180	0.0500	0.200	mg/L	1	17-Dec-2019 11:06
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	17-Dec-2019 11:06
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	17-Dec-2019 11:06
Sodium	179		0.0140	0.0500	0.200	mg/L	1	17-Dec-2019 11:06
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	17-Dec-2019 11:06
Vanadium	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	17-Dec-2019 11:06
Zinc	0.00373	J	0.00200	0.00250	0.00500	mg/L	1	17-Dec-2019 11:06
MERCURY BY SW7470A		Method:SW7470				Prep:SW7470 / 13-Dec-2019		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	13-Dec-2019 15:38
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		Method:NA						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	23-Dec-2019 17:05

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

ALS Houston, US

Date: 23-Dec-19

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP 18 24
 Sample ID: 18ww17_120619
 Collection Date: 06-Dec-2019 11:25

ANALYTICAL REPORT
 WorkOrder:HS19120386
 Lab ID:HS19120386-06
 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	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 15:39	
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Dec-2019 15:39	
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	10-Dec-2019 15:39	
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 15:39	
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Dec-2019 15:39	
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Dec-2019 15:39	
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 15:39	
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Dec-2019 15:39	
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	10-Dec-2019 15:39	
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	10-Dec-2019 15:39	
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 15:39	
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Dec-2019 15:39	
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Dec-2019 15:39	
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	10-Dec-2019 15:39	
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Dec-2019 15:39	
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	10-Dec-2019 15:39	
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 15:39	
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Dec-2019 15:39	
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 15:39	
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Dec-2019 15:39	
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Dec-2019 15:39	
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	10-Dec-2019 15:39	
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 15:39	
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	10-Dec-2019 15:39	
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Dec-2019 15:39	
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 15:39	
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	10-Dec-2019 15:39	
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	10-Dec-2019 15:39	
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Dec-2019 15:39	
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Dec-2019 15:39	
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Dec-2019 15:39	
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Dec-2019 15:39	
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	10-Dec-2019 15:39	
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	10-Dec-2019 15:39	
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	10-Dec-2019 15:39	
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	10-Dec-2019 15:39	
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 15:39	
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 15:39	
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	10-Dec-2019 15:39	

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

ALS Houston, US

Date: 23-Dec-19

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP 18 24
 Sample ID: 18ww17_120619
 Collection Date: 06-Dec-2019 11:25

ANALYTICAL REPORT
 WorkOrder:HS19120386
 Lab ID:HS19120386-06
 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	10-Dec-2019 15:39	
cis-1,2-Dichloroethene	0.74	J	0.20	0.50	1.0	UG/L	1	10-Dec-2019 15:39	
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	10-Dec-2019 15:39	
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 15:39	
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Dec-2019 15:39	
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 15:39	
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 15:39	
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	UG/L	1	10-Dec-2019 15:39	
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 15:39	
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	10-Dec-2019 15:39	
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	10-Dec-2019 15:39	
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Dec-2019 15:39	
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 15:39	
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 15:39	
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 15:39	
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 15:39	
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 15:39	
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 15:39	
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 15:39	
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Dec-2019 15:39	
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Dec-2019 15:39	
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Dec-2019 15:39	
Trichloroethene	39		0.20	0.50	1.0	UG/L	1	10-Dec-2019 15:39	
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Dec-2019 15:39	
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	10-Dec-2019 15:39	
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>92.3</i>			0	<i>81-118</i>	<i>%REC</i>	<i>1</i>	<i>10-Dec-2019 15:39</i>	
<i>Surr: 4-Bromofluorobenzene</i>	<i>98.4</i>			0	<i>85-114</i>	<i>%REC</i>	<i>1</i>	<i>10-Dec-2019 15:39</i>	
<i>Surr: Dibromofluoromethane</i>	<i>93.4</i>			0	<i>80-119</i>	<i>%REC</i>	<i>1</i>	<i>10-Dec-2019 15:39</i>	
<i>Surr: Toluene-d8</i>	<i>102</i>			0	<i>89-112</i>	<i>%REC</i>	<i>1</i>	<i>10-Dec-2019 15:39</i>	

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

ALS Houston, US

Date: 23-Dec-19

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP 18 24
 Sample ID: 18ww17_120619
 Collection Date: 06-Dec-2019 11:25

ANALYTICAL REPORT
 WorkOrder:HS19120386
 Lab ID:HS19120386-06
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A			Method:SW6020			Prep:SW3010A / 13-Dec-2019		Analyst: JHD
Aluminum	0.00775	J	0.00180	0.00500	0.0100	mg/L	1	17-Dec-2019 11:09
Antimony	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	17-Dec-2019 11:09
Arsenic	0.000411	J	0.000400	0.000500	0.00500	mg/L	1	17-Dec-2019 11:09
Barium	3.28		0.0380	0.0500	0.100	mg/L	20	17-Dec-2019 12:24
Beryllium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	17-Dec-2019 11:09
Cadmium	0.000392	J	0.000200	0.000500	0.00200	mg/L	1	17-Dec-2019 11:09
Calcium	326		0.680	1.00	10.0	mg/L	20	17-Dec-2019 12:24
Chromium	0.0411		0.000400	0.000500	0.00500	mg/L	1	17-Dec-2019 11:09
Cobalt	0.00213	J	0.000100	0.000500	0.00500	mg/L	1	17-Dec-2019 11:09
Copper	0.00515		0.00100	0.00250	0.00500	mg/L	1	17-Dec-2019 11:09
Iron	0.548		0.0120	0.0500	0.200	mg/L	1	17-Dec-2019 11:09
Lead	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	17-Dec-2019 11:09
Magnesium	215		0.200	1.00	4.00	mg/L	20	17-Dec-2019 12:24
Manganese	0.0461		0.000700	0.00250	0.00500	mg/L	1	17-Dec-2019 11:09
Nickel	0.134		0.000600	0.00100	0.00500	mg/L	1	17-Dec-2019 11:09
Potassium	1.55		0.0180	0.0500	0.200	mg/L	1	17-Dec-2019 11:09
Selenium	0.00236	J	0.00110	0.00250	0.00500	mg/L	1	17-Dec-2019 11:09
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	17-Dec-2019 11:09
Sodium	1,060		0.280	1.00	4.00	mg/L	20	17-Dec-2019 12:24
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	17-Dec-2019 11:09
Vanadium	0.00186	J	0.000600	0.00100	0.00500	mg/L	1	17-Dec-2019 11:09
Zinc	0.0183		0.00200	0.00250	0.00500	mg/L	1	17-Dec-2019 11:09
MERCURY BY SW7470A			Method:SW7470			Prep:SW7470 / 13-Dec-2019		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	13-Dec-2019 15:40
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)			Method:NA			Analyst: SUB		
Subcontract Analysis	See Attached		0	0		NA	1	23-Dec-2019 17:05

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

Weight / Prep Log

Client: Bhate Environmental Associates, Inc.

Project: LHAAP 18 24

WorkOrder: HS19120386

Batch ID: 148468	Start Date: 10 Dec 2019 09:12	End Date: 10 Dec 2019 14:30
Method: SV AQ SEP FUN EXTRACT-LOWLEV - 3510C	Prep Code: 3510_B_SIM	

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19120386-01	1	1000 (mL)	1 (mL)	0.001
HS19120386-02	1	1000 (mL)	1 (mL)	0.001
HS19120386-03	1	1000 (mL)	1 (mL)	0.001
HS19120386-04	1	1000 (mL)	1 (mL)	0.001

Batch ID: 148640	Start Date: 13 Dec 2019 11:30	End Date: 13 Dec 2019 15:30
Method: WATER - SW3010A	Prep Code: 3010A	

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19120386-01		10 (mL)	10 (mL)	1
HS19120386-02		10 (mL)	10 (mL)	1
HS19120386-05		10 (mL)	10 (mL)	1
HS19120386-06		10 (mL)	10 (mL)	1

Batch ID: 148663	Start Date: 13 Dec 2019 10:30	End Date: 13 Dec 2019 12:30
Method: MERCURY PREP BY 7470A- WATER	Prep Code: HG_WPR	

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19120386-01		10 (mL)	10 (mL)	1
HS19120386-02		10 (mL)	10 (mL)	1
HS19120386-05		10 (mL)	10 (mL)	1
HS19120386-06		10 (mL)	10 (mL)	1

ALS Houston, US

Date: 23-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19120386

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: 148468 (0)		Test Name : SEMIVOLATILES SIM			Matrix: Groundwater	
HS19120386-01	18CptMW12SW_120619	06 Dec 2019 07:50		10 Dec 2019 09:12	16 Dec 2019 09:06	1
HS19120386-02	18CpTMW12DW_120619	06 Dec 2019 08:40		10 Dec 2019 09:12	16 Dec 2019 09:25	1
HS19120386-03	MW7_120619	06 Dec 2019 09:30		10 Dec 2019 09:12	16 Dec 2019 14:05	100
HS19120386-04	18CpTMW10SW_120619	06 Dec 2019 10:25		10 Dec 2019 09:12	16 Dec 2019 10:03	1
Batch ID: 148640 (0)		Test Name : METALS BY ICPMS BY SW6020A			Matrix: Groundwater	
HS19120386-01	18CptMW12SW_120619	06 Dec 2019 07:50		13 Dec 2019 14:30	18 Dec 2019 15:32	2
HS19120386-01	18CptMW12SW_120619	06 Dec 2019 07:50		13 Dec 2019 14:30	17 Dec 2019 12:26	10
HS19120386-01	18CptMW12SW_120619	06 Dec 2019 07:50		13 Dec 2019 14:30	17 Dec 2019 11:16	1
HS19120386-02	18CpTMW12DW_120619	06 Dec 2019 08:40		13 Dec 2019 14:30	17 Dec 2019 11:04	1
HS19120386-05	18CpTMW10DW_120619	06 Dec 2019 11:10		13 Dec 2019 14:30	17 Dec 2019 11:06	1
HS19120386-06	18ww17_120619	06 Dec 2019 11:25		13 Dec 2019 14:30	17 Dec 2019 12:24	20
HS19120386-06	18ww17_120619	06 Dec 2019 11:25		13 Dec 2019 14:30	17 Dec 2019 11:09	1
Batch ID: 148663 (0)		Test Name : MERCURY BY SW7470A			Matrix: Groundwater	
HS19120386-01	18CptMW12SW_120619	06 Dec 2019 07:50		13 Dec 2019 10:30	13 Dec 2019 15:35	1
HS19120386-02	18CpTMW12DW_120619	06 Dec 2019 08:40		13 Dec 2019 10:30	13 Dec 2019 15:37	1
HS19120386-05	18CpTMW10DW_120619	06 Dec 2019 11:10		13 Dec 2019 10:30	13 Dec 2019 15:38	1
HS19120386-06	18ww17_120619	06 Dec 2019 11:25		13 Dec 2019 10:30	13 Dec 2019 15:40	1
Batch ID: R352218 (0)		Test Name : VOLATILES ORGANICS BY METHOD 8260C			Matrix: Groundwater	
HS19120386-01	18CptMW12SW_120619	06 Dec 2019 07:50			10 Dec 2019 14:51	1
HS19120386-02	18CpTMW12DW_120619	06 Dec 2019 08:40			10 Dec 2019 15:15	1
HS19120386-03	MW7_120619	06 Dec 2019 09:30			10 Dec 2019 17:15	50
HS19120386-03	MW7_120619	06 Dec 2019 09:30			10 Dec 2019 16:03	1
HS19120386-04	18CpTMW10SW_120619	06 Dec 2019 10:25			10 Dec 2019 18:51	1
HS19120386-05	18CpTMW10DW_120619	06 Dec 2019 11:10			10 Dec 2019 19:15	1
HS19120386-06	18ww17_120619	06 Dec 2019 11:25			10 Dec 2019 15:39	1
Batch ID: R353152 (0)		Test Name : SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)			Matrix: Groundwater	
HS19120386-01	18CptMW12SW_120619	06 Dec 2019 07:50			23 Dec 2019 17:05	1
HS19120386-02	18CpTMW12DW_120619	06 Dec 2019 08:40			23 Dec 2019 17:05	1
HS19120386-03	MW7_120619	06 Dec 2019 09:30			23 Dec 2019 17:05	1
HS19120386-04	18CpTMW10SW_120619	06 Dec 2019 10:25			23 Dec 2019 17:05	1
HS19120386-05	18CpTMW10DW_120619	06 Dec 2019 11:10			23 Dec 2019 17:05	1
HS19120386-06	18ww17_120619	06 Dec 2019 11:25			23 Dec 2019 17:05	1

ALS Houston, US

Date: 23-Dec-19

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP 18 24
 WorkOrder: HS19120386

QC BATCH REPORT

Batch ID: 148640 (0)		Instrument: ICPMS05		Method: METALS BY ICPMS BY SW6020A						
MBLK	Sample ID: MBLK-148640	Units: mg/L			Analysis Date: 17-Dec-2019 10:51					
Client ID:	Run ID: ICPMS05_352677	SeqNo: 5394917	PrepDate: 13-Dec-2019	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.006538	0.0100								J
Antimony	0.000500	0.00500								U
Arsenic	0.000500	0.00500								U
Barium	0.00250	0.00500								U
Beryllium	0.000500	0.00200								U
Cadmium	0.000500	0.00200								U
Calcium	0.0500	0.500								U
Chromium	0.000500	0.00500								U
Cobalt	0.000500	0.00500								U
Copper	0.00250	0.00500								U
Iron	0.0500	0.200								U
Lead	0.00100	0.00500								U
Magnesium	0.0500	0.200								U
Manganese	0.00250	0.00500								U
Nickel	0.00100	0.00500								U
Potassium	0.0500	0.200								U
Selenium	0.00250	0.00500								U
Silver	0.000500	0.00500								U
Sodium	0.0500	0.200								U
Thallium	0.000500	0.00200								U
Vanadium	0.00100	0.00500								U
Zinc	0.00250	0.00500								U

ALS Houston, US

Date: 23-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19120386

QC BATCH REPORT

Batch ID: 148640 (0)		Instrument: ICPMS05		Method: METALS BY ICPMS BY SW6020A						
LCS	Sample ID: LCS-148640	Units: mg/L			Analysis Date: 17-Dec-2019 10:53					
Client ID:	Run ID: ICPMS05_352677	SeqNo: 5394918		PrepDate: 13-Dec-2019		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
Aluminum	0.0907	0.0100	0.1	0	90.7	84 - 117				
Antimony	0.04987	0.00500	0.05	0	99.7	85 - 117				
Arsenic	0.04935	0.00500	0.05	0	98.7	84 - 116				
Barium	0.04729	0.00500	0.05	0	94.6	86 - 114				
Beryllium	0.04943	0.00200	0.05	0	98.9	83 - 121				
Cadmium	0.04972	0.00200	0.05	0	99.4	87 - 115				
Calcium	5.076	0.500	5	0	102	87 - 118				
Chromium	0.0485	0.00500	0.05	0	97.0	85 - 116				
Cobalt	0.04964	0.00500	0.05	0	99.3	86 - 115				
Copper	0.04961	0.00500	0.05	0	99.2	85 - 118				
Iron	5.135	0.200	5	0	103	87 - 118				
Lead	0.04709	0.00500	0.05	0	94.2	88 - 115				
Magnesium	5.044	0.200	5	0	101	83 - 118				
Manganese	0.05016	0.00500	0.05	0	100	87 - 115				
Nickel	0.05126	0.00500	0.05	0	103	85 - 117				
Potassium	5.086	0.200	5	0	102	87 - 115				
Selenium	0.05047	0.00500	0.05	0	101	80 - 120				
Silver	0.04548	0.00500	0.05	0	91.0	85 - 116				
Sodium	5.056	0.200	5	0	101	85 - 117				
Thallium	0.0444	0.00200	0.05	0	88.8	82 - 116				
Vanadium	0.04849	0.00500	0.05	0	97.0	86 - 115				
Zinc	0.05151	0.00500	0.05	0	103	83 - 119				

ALS Houston, US

Date: 23-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19120386

QC BATCH REPORT

Batch ID: 148640 (0)		Instrument: ICPMS05		Method: METALS BY ICPMS BY SW6020A						
MS		Sample ID: HS19120386-01MS		Units: mg/L		Analysis Date: 17-Dec-2019 11:20				
Client ID: 18CptMW12SW_120619		Run ID: ICPMS05_352677		SeqNo: 5394930		PrepDate: 13-Dec-2019		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
Aluminum	0.1153	0.0100	0.1	0.0378	77.5	84 - 117			S	
Antimony	0.05003	0.00500	0.05	0.000146	99.8	85 - 117				
Arsenic	0.05042	0.00500	0.05	0.000792	99.3	84 - 116				
Barium	0.8194	0.00500	0.05	0.8153	8.21	86 - 114			SO	
Beryllium	0.05303	0.00200	0.05	0.000006	106	83 - 121				
Cadmium	0.04769	0.00200	0.05	0.000159	95.1	87 - 115				
Calcium	67.27	0.500	5	63.27	80.0	87 - 118			SO	
Chromium	0.05613	0.00500	0.05	0.007248	97.8	85 - 116				
Cobalt	0.05016	0.00500	0.05	0.002323	95.7	86 - 115				
Copper	0.04887	0.00500	0.05	0.00014	97.5	85 - 118				
Iron	5.731	0.200	5	0.776	99.1	87 - 118				
Lead	0.04884	0.00500	0.05	0.000053	97.6	88 - 115				
Magnesium	37.85	0.200	5	33.67	83.7	83 - 118			O	
Manganese	0.4258	0.00500	0.05	0.3904	70.9	87 - 115			SO	
Nickel	0.05467	0.00500	0.05	0.006239	96.9	85 - 117				
Potassium	44.94	0.200	5	41.28	73.2	87 - 115			SO	
Selenium	0.05103	0.00500	0.05	0.000157	102	80 - 120				
Silver	0.04376	0.00500	0.05	0.000016	87.5	85 - 116				
Sodium	223.9	0.200	5	226.7	-55.8	85 - 117			SEO	
Thallium	0.04494	0.00200	0.05	0.000097	89.7	82 - 116				
Vanadium	0.0499	0.00500	0.05	0.00057	98.7	86 - 115				
Zinc	0.06194	0.00500	0.05	0.01223	99.4	83 - 119				

ALS Houston, US

Date: 23-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19120386

QC BATCH REPORT

Batch ID: 148640 (0)		Instrument: ICPMS05		Method: METALS BY ICPMS BY SW6020A						
MSD		Sample ID: HS19120386-01MSD		Units: mg/L		Analysis Date: 17-Dec-2019 11:22				
Client ID: 18CptMW12SW_120619		Run ID: ICPMS05_352677		SeqNo: 5394931		PrepDate: 13-Dec-2019		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.1041	0.0100	0.1	0.0378	66.3	84 - 117	0.1153	10.2	20	S
Antimony	0.04945	0.00500	0.05	0.000146	98.6	85 - 117	0.05003	1.18	20	
Arsenic	0.04915	0.00500	0.05	0.000792	96.7	84 - 116	0.05042	2.55	20	
Barium	0.8149	0.00500	0.05	0.8153	-0.786	86 - 114	0.8194	0.551	20	SO
Beryllium	0.05256	0.00200	0.05	0.000006	105	83 - 121	0.05303	0.89	20	
Cadmium	0.04763	0.00200	0.05	0.000159	94.9	87 - 115	0.04769	0.141	20	
Calcium	65.16	0.500	5	63.27	37.9	87 - 118	67.27	3.18	20	SO
Chromium	0.05411	0.00500	0.05	0.007248	93.7	85 - 116	0.05613	3.65	20	
Cobalt	0.04766	0.00500	0.05	0.002323	90.7	86 - 115	0.05016	5.13	20	
Copper	0.0468	0.00500	0.05	0.00014	93.3	85 - 118	0.04887	4.32	20	
Iron	5.493	0.200	5	0.776	94.3	87 - 118	5.731	4.25	20	
Lead	0.04838	0.00500	0.05	0.000053	96.7	88 - 115	0.04884	0.944	20	
Magnesium	37.06	0.200	5	33.67	67.9	83 - 118	37.85	2.11	20	SO
Manganese	0.4257	0.00500	0.05	0.3904	70.6	87 - 115	0.4258	0.0324	20	SO
Nickel	0.0518	0.00500	0.05	0.006239	91.1	85 - 117	0.05467	5.39	20	
Potassium	43.42	0.200	5	41.28	42.7	87 - 115	44.94	3.45	20	SO
Selenium	0.0485	0.00500	0.05	0.000157	96.7	80 - 120	0.05103	5.08	20	
Silver	0.04285	0.00500	0.05	0.000016	85.7	85 - 116	0.04376	2.12	20	
Sodium	219.4	0.200	5	226.7	-145	85 - 117	223.9	2.01	20	SEO
Thallium	0.04507	0.00200	0.05	0.000097	89.9	82 - 116	0.04494	0.276	20	
Vanadium	0.04897	0.00500	0.05	0.00057	96.8	86 - 115	0.0499	1.87	20	
Zinc	0.05908	0.00500	0.05	0.01223	93.7	83 - 119	0.06194	4.73	20	
PDS		Sample ID: HS19120386-01PDS		Units: mg/L		Analysis Date: 18-Dec-2019 15:37				
Client ID: 18CptMW12SW_120619		Run ID: ICPMS05_352780		SeqNo: 5402979		PrepDate: 13-Dec-2019		DF: 2		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.2096	0.0200	0.2	0.01455	97.5	80 - 120				

ALS Houston, US

Date: 23-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19120386

QC BATCH REPORT

Batch ID: 148640 (0)		Instrument: ICPMS05		Method: METALS BY ICPMS BY SW6020A						
PDS		Sample ID: HS19120386-01PDS		Units: mg/L		Analysis Date: 17-Dec-2019 11:25				
Client ID: 18CptMW12SW_120619		Run ID: ICPMS05_352677		SeqNo: 5394932		PrepDate: 13-Dec-2019		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
Antimony	0.08761	0.00500	0.1	0.000146	87.5	80 - 120				
Arsenic	0.08842	0.00500	0.1	0.000792	87.6	80 - 120				
Barium	0.8064	0.00500	0.1	0.8153	-8.94	80 - 120			SO	
Beryllium	0.08793	0.00200	0.1	0.000006	87.9	80 - 120				
Cadmium	0.08769	0.00200	0.1	0.000159	87.5	80 - 120				
Calcium	62.35	0.500	10	63.27	-9.25	80 - 120			SO	
Chromium	0.09194	0.00500	0.1	0.007248	84.7	80 - 120				
Cobalt	0.08431	0.00500	0.1	0.002323	82.0	80 - 120				
Copper	0.08561	0.00500	0.1	0.00014	85.5	80 - 120				
Iron	9.378	0.200	10	0.776	86.0	80 - 120				
Lead	0.08719	0.00500	0.1	0.000053	87.1	80 - 120				
Nickel	0.08831	0.00500	0.1	0.006239	82.1	80 - 120				
Potassium	44.25	0.200	10	41.28	29.7	80 - 120			SO	
Selenium	0.09064	0.00500	0.1	0.000157	90.5	80 - 120				
Thallium	0.08435	0.00200	0.1	0.000097	84.3	80 - 120				
Vanadium	0.08755	0.00500	0.1	0.00057	87.0	80 - 120				
Zinc	0.1014	0.00500	0.1	0.01223	89.2	80 - 120				
PDS		Sample ID: HS19120386-01PDS		Units: mg/L		Analysis Date: 17-Dec-2019 12:31				
Client ID: 18CptMW12SW_120619		Run ID: ICPMS05_352677		SeqNo: 5395314		PrepDate: 13-Dec-2019		DF: 10		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
Magnesium	123.2	2.00	100	35.18	88.0	80 - 120				
Manganese	1.257	0.0500	1	0.379	87.9	80 - 120				
Sodium	301	2.00	100	232.2	68.9	80 - 120			S	
SD		Sample ID: HS19120386-01SD		Units: mg/L		Analysis Date: 18-Dec-2019 15:35				
Client ID: 18CptMW12SW_120619		Run ID: ICPMS05_352780		SeqNo: 5402978		PrepDate: 13-Dec-2019		DF: 10		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	RPD Limit Qual	
Aluminum	0.02229	0.100					0.01455	0 10	J	

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Date: 23-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19120386

QC BATCH REPORT

Batch ID: 148640 (0)		Instrument: ICPMS05		Method: METALS BY ICPMS BY SW6020A						
SD	Sample ID: HS19120386-01SD	Units: mg/L			Analysis Date: 17-Dec-2019 11:18					
Client ID: 18CptMW12SW_120619	Run ID: ICPMS05_352677	SeqNo: 5394929	PrepDate: 13-Dec-2019	DF: 5						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Antimony	0.00250	0.0250					0.000146	0	10	U
Arsenic	0.00250	0.0250					0.000792	0	10	U
Barium	0.7833	0.0250					0.8153	3.93	10	
Beryllium	0.00250	0.0100					0.000006	0	10	U
Cadmium	0.00250	0.0100					0.000159	0	10	U
Calcium	62.77	2.50					63.27	0.791	10	
Chromium	0.008182	0.0250					0.007248	0	10	J
Cobalt	0.002434	0.0250					0.002323	0	10	J
Copper	0.0125	0.0250					0.00014	0	10	U
Iron	0.7668	1.00					0.776	0	10	J
Lead	0.00500	0.0250					0.000053	0	10	U
Nickel	0.006499	0.0250					0.006239	0	10	J
Potassium	43.81	1.00					41.28	6.14	10	
Selenium	0.0125	0.0250					0.000157	0	10	U
Silver	0.00250	0.0250					0.000016	0	10	U
Thallium	0.00250	0.0100					0.000097	0	10	U
Vanadium	0.003811	0.0250					0.00057	0	10	J
Zinc	0.01171	0.0250					0.01223	0	10	J
SD	Sample ID: HS19120386-01SD	Units: mg/L			Analysis Date: 17-Dec-2019 12:28					
Client ID: 18CptMW12SW_120619	Run ID: ICPMS05_352677	SeqNo: 5395313	PrepDate: 13-Dec-2019	DF: 50						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Magnesium	34.34	10.0					35.18	2.39	10	
Manganese	0.395	0.250					0.379	4.23	10	
Sodium	234	10.0					232.2	0.796	10	
The following samples were analyzed in this batch:										
HS19120386-01 HS19120386-02 HS19120386-05 HS19120386-06										

ALS Houston, US

Date: 23-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19120386

QC BATCH REPORT

Batch ID: 148663 (0)		Instrument: HG03		Method: MERCURY BY SW7470A						
MBLK	Sample ID: MBLK-148663	Units: mg/L		Analysis Date: 13-Dec-2019 15:11						
Client ID:	Run ID: HG03_352483	SeqNo: 5389505		PrepDate: 13-Dec-2019		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual	
Mercury	0.000100	0.000200							U	
LCS	Sample ID: LCS-148663	Units: mg/L		Analysis Date: 13-Dec-2019 15:13						
Client ID:	Run ID: HG03_352483	SeqNo: 5389506		PrepDate: 13-Dec-2019		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual	
Mercury	0.00530	0.000200	0.005	0	106	80 - 120				
MS	Sample ID: HS19120553-03MS	Units: mg/L		Analysis Date: 13-Dec-2019 15:16						
Client ID:	Run ID: HG03_352483	SeqNo: 5389508		PrepDate: 13-Dec-2019		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual	
Mercury	0.00510	0.000200	0.005	-0.00001900	102	75 - 125				
MSD	Sample ID: HS19120553-03MSD	Units: mg/L		Analysis Date: 13-Dec-2019 15:18						
Client ID:	Run ID: HG03_352483	SeqNo: 5389509		PrepDate: 13-Dec-2019		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual	
Mercury	0.00513	0.000200	0.005	-0.00001900	103	75 - 125	0.005100	0.587	20	
The following samples were analyzed in this batch:										
HS19120386-01		HS19120386-02		HS19120386-05		HS19120386-06				

ALS Houston, US

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Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19120386

QC BATCH REPORT

Batch ID: 148468 (0)		Instrument: SV-6		Method: SEMIVOLATILES SIM						
MBLK	Sample ID: MBLK-148468	Units: ug/L			Analysis Date: 16-Dec-2019 08:09					
Client ID:	Run ID: SV-6_352609	SeqNo: 5392506		PrepDate: 10-Dec-2019		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
1,4-Dioxane	0.010	0.010							U	
<i>Surr: 2-Fluorobiphenyl</i>	<i>0.08708</i>	<i>0</i>	<i>0.08</i>	<i>0</i>	<i>109</i>	<i>40 - 140</i>				
<i>Surr: 4-Terphenyl-d14</i>	<i>0.07634</i>	<i>0</i>	<i>0.08</i>	<i>0</i>	<i>95.4</i>	<i>40 - 140</i>				
<i>Surr: Nitrobenzene-d5</i>	<i>0.08289</i>	<i>0</i>	<i>0.08</i>	<i>0</i>	<i>104</i>	<i>40 - 140</i>				
LCS	Sample ID: LCS-148468	Units: ug/L			Analysis Date: 16-Dec-2019 08:28					
Client ID:	Run ID: SV-6_352609	SeqNo: 5392507		PrepDate: 10-Dec-2019		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
1,4-Dioxane	0.0945	0.010	0.08	0	118	40 - 140				
<i>Surr: 2-Fluorobiphenyl</i>	<i>0.07699</i>	<i>0</i>	<i>0.08</i>	<i>0</i>	<i>96.2</i>	<i>40 - 140</i>				
<i>Surr: 4-Terphenyl-d14</i>	<i>0.07619</i>	<i>0</i>	<i>0.08</i>	<i>0</i>	<i>95.2</i>	<i>40 - 140</i>				
<i>Surr: Nitrobenzene-d5</i>	<i>0.08986</i>	<i>0</i>	<i>0.08</i>	<i>0</i>	<i>112</i>	<i>40 - 140</i>				
LCSD	Sample ID: LCSD-148468	Units: ug/L			Analysis Date: 16-Dec-2019 08:47					
Client ID:	Run ID: SV-6_352609	SeqNo: 5392508		PrepDate: 10-Dec-2019		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
1,4-Dioxane	0.08716	0.010	0.08	0	109	40 - 140	0.0945	8.08	20	
<i>Surr: 2-Fluorobiphenyl</i>	<i>0.08114</i>	<i>0</i>	<i>0.08</i>	<i>0</i>	<i>101</i>	<i>40 - 140</i>	<i>0.07699</i>	<i>5.25</i>	<i>20</i>	
<i>Surr: 4-Terphenyl-d14</i>	<i>0.06642</i>	<i>0</i>	<i>0.08</i>	<i>0</i>	<i>83.0</i>	<i>40 - 140</i>	<i>0.07619</i>	<i>13.7</i>	<i>20</i>	
<i>Surr: Nitrobenzene-d5</i>	<i>0.09291</i>	<i>0</i>	<i>0.08</i>	<i>0</i>	<i>116</i>	<i>40 - 140</i>	<i>0.08986</i>	<i>3.34</i>	<i>20</i>	
The following samples were analyzed in this batch:										
HS19120386-01		HS19120386-02		HS19120386-03		HS19120386-04				

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Date: 23-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19120386

QC BATCH REPORT

Batch ID: R352218 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MBLK	Sample ID: VBLKW-191210	Units: UG/L			Analysis Date: 10-Dec-2019 14:27					
Client ID:	Run ID: VOA6_352218	SeqNo: 5383347	PrepDate:	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	0.50	1.0								U
1,1,1-Trichloroethane	0.50	1.0								U
1,1,2,2-Tetrachloroethane	0.50	1.0								U
1,1,2-Trichloroethane	0.50	1.0								U
1,1-Dichloroethane	0.50	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,1-Dichloropropene	0.50	1.0								U
1,2,3-Trichlorobenzene	0.50	1.0								U
1,2,3-Trichloropropane	0.50	1.0								U
1,2,4-Trichlorobenzene	0.50	1.0								U
1,2,4-Trimethylbenzene	0.50	1.0								U
1,2-Dibromo-3-chloropropane	0.50	1.0								U
1,2-Dibromoethane	0.50	1.0								U
1,2-Dichlorobenzene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
1,2-Dichloropropane	0.50	1.0								U
1,3,5-Trimethylbenzene	0.50	1.0								U
1,3-Dichlorobenzene	0.50	1.0								U
1,3-Dichloropropane	0.50	1.0								U
1,4-Dichlorobenzene	0.50	1.0								U
2,2-Dichloropropane	0.50	1.0								U
2-Butanone	1.0	2.0								U
2-Chlorotoluene	0.50	1.0								U
2-Hexanone	1.0	2.0								U
4-Chlorotoluene	0.50	1.0								U
4-Isopropyltoluene	0.50	1.0								U
4-Methyl-2-pentanone	1.0	2.0								U
Acetone	1.0	2.0								U
Benzene	0.50	1.0								U
Bromobenzene	0.50	1.0								U
Bromochloromethane	0.50	1.0								U
Bromodichloromethane	0.50	1.0								U
Bromoform	0.50	1.0								U
Bromomethane	0.50	1.0								U

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Date: 23-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19120386

QC BATCH REPORT

Batch ID: R352218 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MBLK	Sample ID: VBLKW-191210	Units: UG/L			Analysis Date: 10-Dec-2019 14:27					
Client ID:	Run ID: VOA6_352218	SeqNo: 5383347	PrepDate:	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	1.0	2.0								U
Carbon tetrachloride	0.50	1.0								U
Chlorobenzene	0.50	1.0								U
Chloroethane	0.50	1.0								U
Chloroform	0.50	1.0								U
Chloromethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
cis-1,3-Dichloropropene	0.50	1.0								U
Dibromochloromethane	0.50	1.0								U
Dibromomethane	0.50	1.0								U
Dichlorodifluoromethane	0.50	1.0								U
Ethylbenzene	0.50	1.0								U
Hexachlorobutadiene	0.50	1.0								U
Isopropylbenzene	0.50	1.0								U
m,p-Xylene	1.0	2.0								U
Methylene chloride	1.0	2.0								U
Naphthalene	0.50	1.0								U
n-Butylbenzene	0.50	1.0								U
n-Propylbenzene	0.50	1.0								U
o-Xylene	0.50	1.0								U
sec-Butylbenzene	0.50	1.0								U
Styrene	0.50	1.0								U
tert-Butylbenzene	0.50	1.0								U
Tetrachloroethene	0.50	1.0								U
Toluene	0.50	1.0								U
trans-1,2-Dichloroethene	0.50	1.0								U
trans-1,3-Dichloropropene	0.50	1.0								U
Trichloroethene	0.50	1.0								U
Trichlorofluoromethane	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	46.74	1.0	50	0	93.5	81 - 118				
Surr: 4-Bromofluorobenzene	49.1	1.0	50	0	98.2	85 - 114				
Surr: Dibromofluoromethane	47.16	1.0	50	0	94.3	80 - 119				
Surr: Toluene-d8	50.98	1.0	50	0	102	89 - 112				

ALS Houston, US

Date: 23-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19120386

QC BATCH REPORT

Batch ID: R352218 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
LCS	Sample ID: VLCSW-191210	Units: UG/L			Analysis Date: 10-Dec-2019 13:38					
Client ID:	Run ID: VOA6_352218	SeqNo: 5383346	PrepDate:	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	20.41	1.0	20	0	102	78 - 124				
1,1,1-Trichloroethane	20.7	1.0	20	0	103	74 - 131				
1,1,2,2-Tetrachloroethane	22.01	1.0	20	0	110	71 - 121				
1,1,2-Trichloroethane	21.48	1.0	20	0	107	80 - 119				
1,1-Dichloroethane	22.34	1.0	20	0	112	77 - 125				
1,1-Dichloroethene	17.58	1.0	20	0	87.9	71 - 131				
1,1-Dichloropropene	20.58	1.0	20	0	103	78 - 125				
1,2,3-Trichlorobenzene	24.64	1.0	20	0	123	69 - 129				
1,2,3-Trichloropropane	22.3	1.0	20	0	112	73 - 122				
1,2,4-Trichlorobenzene	22.15	1.0	20	0	111	69 - 130				
1,2,4-Trimethylbenzene	21.82	1.0	20	0	109	76 - 124				
1,2-Dibromo-3-chloropropane	20.78	1.0	20	0	104	62 - 128				
1,2-Dibromoethane	21.15	1.0	20	0	106	77 - 121				
1,2-Dichlorobenzene	20.67	1.0	20	0	103	80 - 119				
1,2-Dichloroethane	20.93	1.0	20	0	105	73 - 128				
1,2-Dichloropropane	21.89	1.0	20	0	109	78 - 122				
1,3,5-Trimethylbenzene	22.09	1.0	20	0	110	75 - 124				
1,3-Dichlorobenzene	21.17	1.0	20	0	106	80 - 119				
1,3-Dichloropropane	21.49	1.0	20	0	107	80 - 119				
1,4-Dichlorobenzene	21.02	1.0	20	0	105	79 - 118				
2,2-Dichloropropane	21.22	1.0	20	0	106	60 - 139				
2-Butanone	45.43	2.0	40	0	114	56 - 143				
2-Chlorotoluene	23.1	1.0	20	0	115	79 - 122				
2-Hexanone	42.47	2.0	40	0	106	57 - 139				
4-Chlorotoluene	22.09	1.0	20	0	110	78 - 122				
4-Isopropyltoluene	21.37	1.0	20	0	107	77 - 127				
4-Methyl-2-pentanone	44.21	2.0	40	0	111	67 - 130				
Acetone	40.51	2.0	40	0	101	39 - 160				
Benzene	21.95	1.0	20	0	110	79 - 120				
Bromobenzene	21.78	1.0	20	0	109	80 - 120				
Bromochloromethane	21.9	1.0	20	0	109	78 - 123				
Bromodichloromethane	21.18	1.0	20	0	106	79 - 125				
Bromoform	20.15	1.0	20	0	101	66 - 130				
Bromomethane	19.32	1.0	20	0	96.6	53 - 141				

ALS Houston, US

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Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
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QC BATCH REPORT

Batch ID: R352218 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
LCS	Sample ID: VLCSW-191210	Units: UG/L			Analysis Date: 10-Dec-2019 13:38					
Client ID:	Run ID: VOA6_352218	SeqNo: 5383346	PrepDate:	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	44.32	2.0	40	0	111	64 - 133				
Carbon tetrachloride	19.12	1.0	20	0	95.6	72 - 136				
Chlorobenzene	21.02	1.0	20	0	105	82 - 118				
Chloroethane	18.22	1.0	20	0	91.1	60 - 138				
Chloroform	20.65	1.0	20	0	103	79 - 124				
Chloromethane	17.29	1.0	20	0	86.4	50 - 139				
cis-1,2-Dichloroethene	22.45	1.0	20	0	112	78 - 123				
cis-1,3-Dichloropropene	21.91	1.0	20	0	110	75 - 124				
Dibromochloromethane	20.63	1.0	20	0	103	74 - 126				
Dibromomethane	20.86	1.0	20	0	104	79 - 123				
Dichlorodifluoromethane	21.3	1.0	20	0	106	32 - 152				
Ethylbenzene	20.92	1.0	20	0	105	79 - 121				
Hexachlorobutadiene	20.59	1.0	20	0	103	66 - 134				
Isopropylbenzene	20.38	1.0	20	0	102	72 - 131				
m,p-Xylene	41.55	2.0	40	0	104	80 - 121				
Methylene chloride	21.49	2.0	20	0	107	74 - 124				
Naphthalene	20.42	1.0	20	0	102	61 - 128				
n-Butylbenzene	20.81	1.0	20	0	104	75 - 128				
n-Propylbenzene	22.11	1.0	20	0	111	76 - 126				
o-Xylene	20.6	1.0	20	0	103	78 - 122				
sec-Butylbenzene	21.35	1.0	20	0	107	77 - 126				
Styrene	20.18	1.0	20	0	101	78 - 123				
tert-Butylbenzene	21.47	1.0	20	0	107	78 - 124				
Tetrachloroethene	19.56	1.0	20	0	97.8	74 - 129				
Toluene	21.17	1.0	20	0	106	80 - 121				
trans-1,2-Dichloroethene	21.97	1.0	20	0	110	75 - 124				
trans-1,3-Dichloropropene	21.16	1.0	20	0	106	73 - 127				
Trichloroethene	21.26	1.0	20	0	106	79 - 123				
Trichlorofluoromethane	17.12	1.0	20	0	85.6	65 - 141				
Vinyl chloride	18.58	1.0	20	0	92.9	58 - 137				
Surr: 1,2-Dichloroethane-d4	53.48	1.0	50	0	107	81 - 118				
Surr: 4-Bromofluorobenzene	50.97	1.0	50	0	102	85 - 114				
Surr: Dibromofluoromethane	51.28	1.0	50	0	103	80 - 119				
Surr: Toluene-d8	47.82	1.0	50	0	95.6	89 - 112				

ALS Houston, US

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Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19120386

QC BATCH REPORT

Batch ID: R352218 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MS		Sample ID: HS19120386-01MS		Units: UG/L		Analysis Date: 10-Dec-2019 16:27				
Client ID: 18CptMW12SW_120619		Run ID: VOA6_352218		SeqNo: 5383352		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	18.46	1.0	20	0	92.3	78 - 124				
1,1,1-Trichloroethane	17.78	1.0	20	0	88.9	74 - 131				
1,1,2,2-Tetrachloroethane	19.51	1.0	20	0	97.6	71 - 121				
1,1,2-Trichloroethane	19.06	1.0	20	0	95.3	80 - 119				
1,1-Dichloroethane	18.36	1.0	20	0	91.8	77 - 125				
1,1-Dichloroethene	14.9	1.0	20	0	74.5	71 - 131				
1,1-Dichloropropene	18.77	1.0	20	0	93.9	78 - 125				
1,2,3-Trichlorobenzene	15.33	1.0	20	0	76.6	69 - 129				
1,2,3-Trichloropropane	19.58	1.0	20	0	97.9	73 - 122				
1,2,4-Trichlorobenzene	15.82	1.0	20	0	79.1	69 - 130				
1,2,4-Trimethylbenzene	20.98	1.0	20	0	105	76 - 124				
1,2-Dibromo-3-chloropropane	17.35	1.0	20	0	86.7	62 - 128				
1,2-Dibromoethane	18.03	1.0	20	0	90.2	77 - 121				
1,2-Dichlorobenzene	18.98	1.0	20	0	94.9	80 - 119				
1,2-Dichloroethane	17.26	1.0	20	0	86.3	73 - 128				
1,2-Dichloropropane	18.37	1.0	20	0	91.8	78 - 122				
1,3,5-Trimethylbenzene	21.53	1.0	20	0	108	75 - 124				
1,3-Dichlorobenzene	20.17	1.0	20	0	101	80 - 119				
1,3-Dichloropropane	18.84	1.0	20	0	94.2	80 - 119				
1,4-Dichlorobenzene	19.61	1.0	20	0	98.1	79 - 118				
2,2-Dichloropropane	17.54	1.0	20	0	87.7	60 - 139				
2-Butanone	32.85	2.0	40	0	82.1	56 - 143				
2-Chlorotoluene	22.04	1.0	20	0	110	79 - 122				
2-Hexanone	36.07	2.0	40	0	90.2	57 - 139				
4-Chlorotoluene	21.11	1.0	20	0	106	78 - 122				
4-Isopropyltoluene	20.65	1.0	20	0	103	77 - 127				
4-Methyl-2-pentanone	36.69	2.0	40	0	91.7	67 - 130				
Acetone	21.31	2.0	40	0	53.3	39 - 160				
Benzene	18.91	1.0	20	0	94.6	79 - 120				
Bromobenzene	20.3	1.0	20	0	102	80 - 120				
Bromochloromethane	16.95	1.0	20	0	84.7	78 - 123				
Bromodichloromethane	17.66	1.0	20	0	88.3	79 - 125				
Bromoform	17.38	1.0	20	0	86.9	66 - 130				
Bromomethane	13.78	1.0	20	0	68.9	53 - 141				

ALS Houston, US

Date: 23-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19120386

QC BATCH REPORT

Batch ID: R352218 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MS		Sample ID: HS19120386-01MS		Units: UG/L		Analysis Date: 10-Dec-2019 16:27				
Client ID: 18CptMW12SW_120619		Run ID: VOA6_352218		SeqNo: 5383352		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
Carbon disulfide	37.43	2.0	40	0	93.6	64 - 133				
Carbon tetrachloride	17.72	1.0	20	0	88.6	72 - 136				
Chlorobenzene	18.62	1.0	20	0	93.1	82 - 118				
Chloroethane	14.24	1.0	20	0	71.2	60 - 138				
Chloroform	16.67	1.0	20	0	83.3	79 - 124				
Chloromethane	11.46	1.0	20	0	57.3	50 - 139				
cis-1,2-Dichloroethene	18.5	1.0	20	0	92.5	78 - 123				
cis-1,3-Dichloropropene	18.22	1.0	20	0	91.1	75 - 124				
Dibromochloromethane	18.28	1.0	20	0	91.4	74 - 126				
Dibromomethane	17.26	1.0	20	0	86.3	79 - 123				
Dichlorodifluoromethane	11.38	1.0	20	0	56.9	32 - 152				
Ethylbenzene	19.39	1.0	20	0	96.9	79 - 121				
Hexachlorobutadiene	15.24	1.0	20	0	76.2	66 - 134				
Isopropylbenzene	19.52	1.0	20	0	97.6	72 - 131				
m,p-Xylene	38.75	2.0	40	0	96.9	80 - 121				
Methylene chloride	16.89	2.0	20	0	84.4	74 - 124				
Naphthalene	15.07	1.0	20	0	75.3	61 - 128				
n-Butylbenzene	20.23	1.0	20	0	101	75 - 128				
n-Propylbenzene	21.67	1.0	20	0	108	76 - 126				
o-Xylene	18.92	1.0	20	0	94.6	78 - 122				
sec-Butylbenzene	21.21	1.0	20	0	106	77 - 126				
Styrene	18.72	1.0	20	0	93.6	78 - 123				
tert-Butylbenzene	21.36	1.0	20	0	107	78 - 124				
Tetrachloroethene	18.89	1.0	20	0	94.4	74 - 129				
Toluene	19.64	1.0	20	0	98.2	80 - 121				
trans-1,2-Dichloroethene	18.07	1.0	20	0	90.4	75 - 124				
trans-1,3-Dichloropropene	17.36	1.0	20	0	86.8	73 - 127				
Trichloroethene	25.5	1.0	20	1.342	121	79 - 123				
Trichlorofluoromethane	14.45	1.0	20	0	72.2	65 - 141				
Vinyl chloride	14.08	1.0	20	0	70.4	58 - 137				
Surr: 1,2-Dichloroethane-d4	47.21	1.0	50	0	94.4	81 - 118				
Surr: 4-Bromofluorobenzene	49.39	1.0	50	0	98.8	85 - 114				
Surr: Dibromofluoromethane	47.16	1.0	50	0	94.3	80 - 119				
Surr: Toluene-d8	50.86	1.0	50	0	102	89 - 112				

ALS Houston, US

Date: 23-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19120386

QC BATCH REPORT

Batch ID: R352218 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MSD	Sample ID: HS19120386-01MSD	Units: UG/L			Analysis Date: 10-Dec-2019 16:51					
Client ID: 18CptMW12SW_120619	Run ID: VOA6_352218	SeqNo: 5383353	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	17.52	1.0	20	0	87.6	78 - 124	18.46	5.22	20	
1,1,1-Trichloroethane	16.55	1.0	20	0	82.7	74 - 131	17.78	7.19	20	
1,1,2,2-Tetrachloroethane	19.07	1.0	20	0	95.3	71 - 121	19.51	2.3	20	
1,1,2-Trichloroethane	17.97	1.0	20	0	89.8	80 - 119	19.06	5.89	20	
1,1-Dichloroethane	16.97	1.0	20	0	84.8	77 - 125	18.36	7.9	20	
1,1-Dichloroethene	13.88	1.0	20	0	69.4	71 - 131	14.9	7.09	20	S
1,1-Dichloropropene	17.52	1.0	20	0	87.6	78 - 125	18.77	6.88	20	
1,2,3-Trichlorobenzene	18.82	1.0	20	0	94.1	69 - 129	15.33	20.4	20	R
1,2,3-Trichloropropane	19.29	1.0	20	0	96.5	73 - 122	19.58	1.5	20	
1,2,4-Trichlorobenzene	17.99	1.0	20	0	90.0	69 - 130	15.82	12.9	20	
1,2,4-Trimethylbenzene	19.6	1.0	20	0	98.0	76 - 124	20.98	6.78	20	
1,2-Dibromo-3-chloropropane	18.14	1.0	20	0	90.7	62 - 128	17.35	4.44	20	
1,2-Dibromoethane	17.5	1.0	20	0	87.5	77 - 121	18.03	2.97	20	
1,2-Dichlorobenzene	18.52	1.0	20	0	92.6	80 - 119	18.98	2.44	20	
1,2-Dichloroethane	16.45	1.0	20	0	82.2	73 - 128	17.26	4.86	20	
1,2-Dichloropropane	17.41	1.0	20	0	87.1	78 - 122	18.37	5.36	20	
1,3,5-Trimethylbenzene	19.88	1.0	20	0	99.4	75 - 124	21.53	7.97	20	
1,3-Dichlorobenzene	18.88	1.0	20	0	94.4	80 - 119	20.17	6.61	20	
1,3-Dichloropropane	17.99	1.0	20	0	89.9	80 - 119	18.84	4.65	20	
1,4-Dichlorobenzene	18.68	1.0	20	0	93.4	79 - 118	19.61	4.88	20	
2,2-Dichloropropane	16.25	1.0	20	0	81.2	60 - 139	17.54	7.66	20	
2-Butanone	32.87	2.0	40	0	82.2	56 - 143	32.85	0.0585	20	
2-Chlorotoluene	20.67	1.0	20	0	103	79 - 122	22.04	6.42	20	
2-Hexanone	35.92	2.0	40	0	89.8	57 - 139	36.07	0.431	20	
4-Chlorotoluene	19.52	1.0	20	0	97.6	78 - 122	21.11	7.8	20	
4-Isopropyltoluene	19.82	1.0	20	0	99.1	77 - 127	20.65	4.13	20	
4-Methyl-2-pentanone	36.48	2.0	40	0	91.2	67 - 130	36.69	0.559	20	
Acetone	21.88	2.0	40	0	54.7	39 - 160	21.31	2.65	20	
Benzene	17.86	1.0	20	0	89.3	79 - 120	18.91	5.69	20	
Bromobenzene	19.36	1.0	20	0	96.8	80 - 120	20.3	4.73	20	
Bromochloromethane	16.45	1.0	20	0	82.3	78 - 123	16.95	2.94	20	
Bromodichloromethane	16.71	1.0	20	0	83.6	79 - 125	17.66	5.53	20	
Bromoform	16.92	1.0	20	0	84.6	66 - 130	17.38	2.68	20	
Bromomethane	12.12	1.0	20	0	60.6	53 - 141	13.78	12.8	20	

ALS Houston, US

Date: 23-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19120386

QC BATCH REPORT

Batch ID: R352218 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MSD		Sample ID: HS19120386-01MSD		Units: UG/L		Analysis Date: 10-Dec-2019 16:51				
Client ID: 18CptMW12SW_120619		Run ID: VOA6_352218		SeqNo: 5383353		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
Carbon disulfide	34.63	2.0	40	0	86.6	64 - 133	37.43	7.76	20	
Carbon tetrachloride	16.46	1.0	20	0	82.3	72 - 136	17.72	7.39	20	
Chlorobenzene	17.43	1.0	20	0	87.2	82 - 118	18.62	6.57	20	
Chloroethane	13.44	1.0	20	0	67.2	60 - 138	14.24	5.75	20	
Chloroform	15.7	1.0	20	0	78.5	79 - 124	16.67	5.96	20 S	
Chloromethane	10.76	1.0	20	0	53.8	50 - 139	11.46	6.25	20	
cis-1,2-Dichloroethene	17.38	1.0	20	0	86.9	78 - 123	18.5	6.24	20	
cis-1,3-Dichloropropene	17.3	1.0	20	0	86.5	75 - 124	18.22	5.16	20	
Dibromochloromethane	17.42	1.0	20	0	87.1	74 - 126	18.28	4.84	20	
Dibromomethane	16.77	1.0	20	0	83.9	79 - 123	17.26	2.86	20	
Dichlorodifluoromethane	10.62	1.0	20	0	53.1	32 - 152	11.38	6.87	20	
Ethylbenzene	18.29	1.0	20	0	91.4	79 - 121	19.39	5.84	20	
Hexachlorobutadiene	16.38	1.0	20	0	81.9	66 - 134	15.24	7.18	20	
Isopropylbenzene	18.17	1.0	20	0	90.8	72 - 131	19.52	7.19	20	
m,p-Xylene	36.14	2.0	40	0	90.4	80 - 121	38.75	6.96	20	
Methylene chloride	15.99	2.0	20	0	80.0	74 - 124	16.89	5.43	20	
Naphthalene	17.2	1.0	20	0	86.0	61 - 128	15.07	13.3	20	
n-Butylbenzene	19.53	1.0	20	0	97.7	75 - 128	20.23	3.52	20	
n-Propylbenzene	20.26	1.0	20	0	101	76 - 126	21.67	6.69	20	
o-Xylene	17.65	1.0	20	0	88.2	78 - 122	18.92	6.96	20	
sec-Butylbenzene	20.12	1.0	20	0	101	77 - 126	21.21	5.24	20	
Styrene	17.66	1.0	20	0	88.3	78 - 123	18.72	5.79	20	
tert-Butylbenzene	20.26	1.0	20	0	101	78 - 124	21.36	5.29	20	
Tetrachloroethene	17.35	1.0	20	0	86.7	74 - 129	18.89	8.48	20	
Toluene	18.25	1.0	20	0	91.3	80 - 121	19.64	7.32	20	
trans-1,2-Dichloroethene	17.02	1.0	20	0	85.1	75 - 124	18.07	6	20	
trans-1,3-Dichloropropene	16.82	1.0	20	0	84.1	73 - 127	17.36	3.2	20	
Trichloroethene	20.16	1.0	20	1.342	94.1	79 - 123	25.5	23.4	20 R	
Trichlorofluoromethane	13.41	1.0	20	0	67.0	65 - 141	14.45	7.44	20	
Vinyl chloride	13.02	1.0	20	0	65.1	58 - 137	14.08	7.77	20	
Surr: 1,2-Dichloroethane-d4	46.85	1.0	50	0	93.7	81 - 118	47.21	0.769	20	
Surr: 4-Bromofluorobenzene	49.48	1.0	50	0	99.0	85 - 114	49.39	0.198	20	
Surr: Dibromofluoromethane	46.25	1.0	50	0	92.5	80 - 119	47.16	1.96	20	
Surr: Toluene-d8	50.69	1.0	50	0	101	89 - 112	50.86	0.328	20	

ALS Houston, US

Date: 23-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19120386

QC BATCH REPORT

Batch ID: R352218 (0)	Instrument: VOA6	Method: VOLATILES ORGANICS BY METHOD 8260C	
The following samples were analyzed in this batch:			
HS19120386-01	HS19120386-02	HS19120386-03	HS19120386-04
HS19120386-05	HS19120386-06		

ALS Houston, US

Date: 23-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19120386

**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 Quantitation 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	19-028-0	27-Mar-2020
California	2919, 2019-2020	30-Apr-2020
Dept of Defense	ANAB L2231	20-Dec-2021
Florida	E87611-28	30-Jun-2020
Illinois	2000322019-2	09-May-2020
Kansas	E-10352 2019-2020	31-Jul-2020
Kentucky	123043, 2019-2020	30-Apr-2020
Louisiana	03087, 2019-2020	30-Jun-2020
Maryland	343, 2019-2020	30-Jun-2020
North Carolina	624-2019	31-Dec-2019
North Dakota	R-193 2019-2020	30-Apr-2020
Oklahoma	2019-067	31-Aug-2020
Texas	TX104704231-19-23	30-Apr-2020

ALS Houston, US

Date: 23-Dec-19

Client: Bhate Environmental Associates, Inc.**Project:** LHAAP 18 24**Work Order:** HS19120386**SAMPLE TRACKING**

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS19120386-01	18CptMW12SW_120619	Login	12/8/2019 12:49:52 PM	NDR	Disposed
HS19120386-01	18CptMW12SW_120619	Login	12/8/2019 12:49:52 PM	NDR	Sub
HS19120386-01	18CptMW12SW_120619	Login	12/8/2019 12:49:52 PM	NDR	Disposed
HS19120386-01	18CptMW12SW_120619	Login	12/8/2019 12:49:52 PM	NDR	Disposed

Sample Receipt Checklist

Client Name: Bhate Environmental
 Work Order: HS19120386

Date/Time Received: **07-Dec-2019 09:00**
 Received by: **JRM**

Checklist completed by: Nilesh D. Ranchod 8-Dec-2019
 eSignature Date

Reviewed by: RJ Modashia 10-Dec-2019
 eSignature Date

Matrices: **Groundwater**

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 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): 1.3c U/c IR11
 Cooler(s)/Kit(s): 45574
 Date/Time sample(s) sent to storage: 12/07/2019 15:00

- 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:



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: NWQ1312.0150
 COC Number(1): _____
 LIMS Number: _____

Facility/Base I.D.: <u>LHAAP</u>							Sample Analysis Requested ⁽⁵⁾							Quality Assurance Samples ⁽⁶⁾						
Project/Site Name: <u>LHAAP / Site 18/24</u>							Number of containers	VOC	PERCHLORATE	TOTAL METALS	1, 4 - DIOXANE						Ambient Blank Lot Control Number	Equipment Blank Lot Control Number	Trip Blank Lot Control Number	Cooler ID
Client Name:																				
Collected by: <u>Scott Beesinger</u>																				
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)														
<u>18CPTMW12SW-120619</u>	<u>06 Dec 2019</u>	<u>0750</u>	<u>-</u>	<u>N</u>		<u>WG</u>	<u>6</u>	<u>X</u>	<u>X</u>	<u>X</u>	<u>X</u>									
<u>18CPTMW12DW-120619</u>	<u>06 Dec 2019</u>	<u>0840</u>	<u>-</u>	<u>N</u>		<u>WG</u>	<u>6</u>	<u>X</u>	<u>X</u>	<u>X</u>	<u>X</u>									
<u>MW7-120619</u>	<u>06 Dec 2019</u>	<u>0930</u>	<u>-</u>	<u>N</u>		<u>WG</u>	<u>5</u>	<u>X</u>	<u>X</u>	<u>X</u>										
<u>18CPTMW10SW-120619</u>	<u>06 Dec 2019</u>	<u>1025</u>	<u>-</u>	<u>N</u>		<u>WG</u>	<u>5</u>	<u>X</u>	<u>X</u>	<u>X</u>										
<u>18CPTMW10DW-120619</u>	<u>06 Dec 2019</u>	<u>1110</u>	<u>-</u>	<u>N</u>		<u>WG</u>	<u>5</u>	<u>X</u>	<u>X</u>	<u>X</u>										
<u>18WW17-120619</u>	<u>06 Dec 2019</u>	<u>1125</u>	<u>-</u>	<u>N</u>		<u>WG</u>	<u>5</u>	<u>X</u>	<u>X</u>	<u>X</u>										
<u>TRIP BLANK</u>	<u>06 Dec 2019</u>		<u>-</u>	<u>TB</u>		<u>W</u>	<u>2</u>	<u>X</u>												

HS19120386
 Bhate Environmental Associates, Inc.
 LHAAP 18 24




COMMENTS: _____

Custody Transfers Prior to Receipt by Laboratory						Sample Delivery Details / Laboratory Receipt			
Relinquished By (Signed)	Date	Time	Received by (signed)	Date	Time	Delivered Directly to Lab:	Shipped	No.:	
<u>Scott Beesinger</u>	<u>12/6/19</u>	<u>1200</u>	<u>J. Mumford</u>	<u>12/7/19</u>	<u>09:00</u>				
2. _____			2. _____			Method of Shipment:			
3. _____			3. _____			Fed	Ex	Airbill	Number:
						Analytical Lab:	<u>ALS 10450 Stancliff Rd, Suite 210 Houston, TX 77099 (281) 530-5656</u>		
						ATTN: <u>SONIA WEST</u>	Lab Recipient:	Delivery Date/Time:	

- Chain of Custody Number = date collected + custody number (e.g. 09-02-1999-01)
- 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)
- 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.)
- 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
- Sample Analysis Requested: Analytical method requested and number of containers provided for each.
- 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 45574
 Temp 1.3
 12/11
 CFOO*

 ALS 10450 Stancliff Rd., Suite 210 Houston, Texas 77099 Tel. +1 281 530 5656 Fax. +1 281 530 5887	CUSTODY SEAL		Seal Broken By: <i>SM</i>
	Date: <i>12/6/19</i>	Time: <i>12:00</i>	Date: <i>12/07/19</i>
	Name: <i>SCOTT BEESINGER</i>		
	Company: <i>BHATE</i>		



**Must Deliver Next Business Day
Time and Temperature Sensitive!**

45574

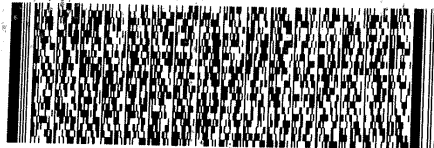
ORIGIN ID:SGRA (903) 930-6193
 SCOTT BEESINGER
 BHATE ENVIRONMENTAL ASSOCIATES
 1203-B EAST GRAND AVE. PMB202
 MARSHALL, TX 75670
 UNITED STATES US

SHIP DATE: 02DEC19
 ACTNGT: 1.00 LB MAN
 CAD: 300130/CAFE3211
 DIMS: 26x14x14 IN

TO: **CLIENT SERVICES**
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON TX 77099

(281) 630-6666
 REF: LHAAP-18/24-BO 68900-RJ

RMA: ||| ||| |||



FedEx
 TRACKING 1251 0292 4162

SATURDAY 12:00P
PRIORITY OVERNIGHT

X0 SGRA

77099
 TX-US
 IAH



F10 162786 06DEC19 GGGA 56AC2/1800/05A2



Case Narrative

Method: 6850
Analysis: Perchlorate
Analysis SOP: LC-MS-CLO4
ALS WO ID(s): 1934606; 1934611

Client: ALS Laboratories (Houston, TX)
Matrix: Water
ELMS Batch (HBN): 2328 (253958)

General Set Information: There were fourteen field samples in these Work Orders. The samples were analyzed for perchlorate.

Method Summary: Each sample was prepared as noted below and analyzed using an Agilent 1100 LC/MSD system in select ion monitoring (SIM) mode at m/z 83 and 85, which corresponds to the loss of one oxygen atom from the perchlorate molecule. ChemStation software was used for instrument control and data analysis. The ion ratio of m/z 83 to 85 was used to positively identify the response peak as perchlorate. Quantitation was performed using the m/z 83 peak area. An internal standard (ISTD) of ^{18}O labeled perchlorate was added to each sample to establish the perchlorate peak retention time and used in quantitation.

Sample Preparation: A 10.0mL aliquot of each sample was transferred into a 15-mL centrifuge tube. 50 μL of an ^{18}O labeled perchlorate solution was added to each sample as an internal standard. The samples were then capped, vortexed, and filtered into autosampler vial using Phenex PES membrane 0.45 μm Syringe filters.

Holding Times: Holding times were met for all analyses.

Dilutions: Field sample 1934606006 was analyzed and reported from a 1:10 dilution. Field sample 1934606005 was analyzed and reported from a 1:100 dilution. Field samples 1934611003/06 were analyzed and reported from 1:1,000 dilutions. The reporting limits have been adjusted accordingly.

Method QC data: The method blank (LMB 689015) was less than 1/2 the CRDL. The recovery for the LCS (689012) was within acceptable parameters.



MS/MSD Analysis: MS/MSD was performed on sample 1934606001 (Client ID: 18CPTMW22R_120519). 3.0 μ L of Working Standard Solution Horizon ID 49947 was added to 10.0mL of sample preparation. The MS/MSD (687323/24) failed QC acceptance criteria for percent recoveries. The relative percent difference (RPD) passed acceptance criteria. The Matrix Spike and Matrix Spike duplicate is reported for the clients' information only. The sample matrix may be inappropriate for the method selected.

Instrument QC: Instrument initial and continuing calibrations were performed in accordance with published procedures.

NC/CAR(s): NA

Sample Calculation: Samples were reported in μ g/L. Results were calculated in μ g/L by the equation (A)x(B),

where: A = Analyte concentration from the standard curve (μ g/L)
B = Dilution performed at time of analysis

Miscellaneous Comments: These samples were analyzed in accordance with the requirements found in the DOD QSM Version 5.1.1. The Reporting Limit Verification Standard (RLVS – 689013) is reported from the analysis of the Laboratory Control Sample (LCS – 689012) at a level of 3.0 μ g/L. Due to limitations of the Chemstation Software, some of the chromatographic peaks may require manual integrations. A manual integration was performed for one of the Initial Calibration analyses (datafile: 20SEPI03) along with datafile 19DEC19D17.

Thomas Bosch December 21, 2019
Analyst Date



ANALYTICAL REPORT

Report Date: December 23, 2019

RJ Modashia
 ALS Environmental (Houston)
 10450 Stancliff Road
 Suite 210
 Houston, TX 77099

Phone: 281 530-5656

E-mail: RJ.Modashia@ALSGlobal.com

Workorder: **34-1934611**

Project ID: HS19120386

Purchase Order: HS19120386

Project Manager Kevin W. Griffiths

Client Sample ID	Lab ID	Collect Date	Receive Date	Sampling Site
18CPTMW12SW_120619	1934611001	12/06/19	12/11/19	
18CPTMW12DW_120619	1934611002	12/06/19	12/11/19	
MW7_120619	1934611003	12/06/19	12/11/19	
18CPTMW10SW_120619	1934611004	12/06/19	12/11/19	
18CPTMW10DW_120619	1934611005	12/06/19	12/11/19	
18WW17_120619	1934611006	12/06/19	12/11/19	

ADDRESS 960 West LeVoy Drive, Salt Lake City, Utah, 84123 USA | PHONE +1 801 266 7700 | FAX +1 801 268 9992

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Environmental 

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RIGHT SOLUTIONS RIGHT PARTNER

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ANALYTICAL REPORT

Workorder: **34-1934611**Client: ALS Environmental
(Houston)

Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: 18CPTMW12SW_120619	Sampling Site: NA	Collected: 12/06/2019				
Lab ID: 1934611001	Media: 125 mL Nalgene	Received: 12/11/2019				
Matrix: Water	Sampling Parameter: NA					
Analysis Method - EPA 6850, DoD QSM						
Preparation: Not Applicable	Analysis: EPA 6850, DoD QSM Water Batch: ELMS/2328 (HBN: 253958) Analyzed: 12/19/2019 12:19	Instrument ID: LCMS04 %Solids: NA Report Basis: Wet				
Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Sample ID: 18CPTMW12DW_120619	Sampling Site: NA	Collected: 12/06/2019				
Lab ID: 1934611002	Media: 125 mL Nalgene	Received: 12/11/2019				
Matrix: Water	Sampling Parameter: NA					
Analysis Method - EPA 6850, DoD QSM						
Preparation: Not Applicable	Analysis: EPA 6850, DoD QSM Water Batch: ELMS/2328 (HBN: 253958) Analyzed: 12/19/2019 12:33	Instrument ID: LCMS04 %Solids: NA Report Basis: Wet				
Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Sample ID: MW7_120619	Sampling Site: NA	Collected: 12/06/2019				
Lab ID: 1934611003	Media: 125 mL Nalgene	Received: 12/11/2019				
Matrix: Water	Sampling Parameter: NA					
Analysis Method - EPA 6850, DoD QSM						
Preparation: Not Applicable	Analysis: EPA 6850, DoD QSM Water Batch: ELMS/2328 (HBN: 253958) Analyzed: 12/19/2019 12:46	Instrument ID: LCMS04 %Solids: NA Report Basis: Wet				
Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	25000	1000	2000	4000	1000	

Sample ID: 18CPTMW10SW_120619	Sampling Site: NA	Collected: 12/06/2019				
Lab ID: 1934611004	Media: 125 mL Nalgene	Received: 12/11/2019				
Matrix: Water	Sampling Parameter: NA					
Analysis Method - EPA 6850, DoD QSM						
Preparation: Not Applicable	Analysis: EPA 6850, DoD QSM Water Batch: ELMS/2328 (HBN: 253958) Analyzed: 12/19/2019 13:00	Instrument ID: LCMS04 %Solids: NA Report Basis: Wet				
Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U



ANALYTICAL REPORT

Workorder: 34-1934611

Client: ALS Environmental
(Houston)

Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: 18CPTMW10DW_120619	Sampling Site: NA	Collected: 12/06/2019				
Lab ID: 1934611005	Media: 125 mL Nalgene	Received: 12/11/2019				
Matrix: Water	Sampling Parameter: NA					
Analysis Method - EPA 6850, DoD QSM						
Preparation: Not Applicable	Analysis: EPA 6850, DoD QSM Water Batch: ELMS/2328 (HBN: 253958) Analyzed: 12/19/2019 13:14	Instrument ID: LCMS04 %Solids: NA Report Basis: Wet				
Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	10	1.0	2.0	4.0	1	

Sample ID: 18WW17_120619	Sampling Site: NA	Collected: 12/06/2019				
Lab ID: 1934611006	Media: 125 mL Nalgene	Received: 12/11/2019				
Matrix: Water	Sampling Parameter: NA					
Analysis Method - EPA 6850, DoD QSM						
Preparation: Not Applicable	Analysis: EPA 6850, DoD QSM Water Batch: ELMS/2328 (HBN: 253958) Analyzed: 12/19/2019 13:28	Instrument ID: LCMS04 %Solids: NA Report Basis: Wet				
Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	74000	1000	2000	4000	1000	

Comments

Quality Control: EPA 6850, DoD QSM - (HBN: 253958)

Field sample 1934606006 was analyzed and reported from a 1:10 dilution. Field sample 1934606005 was analyzed and reported from a 1:100 dilution. Field samples 1934611003/06 were analyzed and reported from 1:1,000 dilutions. The reporting limits have been adjusted accordingly.

Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Method	Analyst	Peer Review
EPA 6850, DoD QSM	/S/ Thomas Bosch 12/20/2019 15:39	/S/ Stephen Brose 12/23/2019 09:16

Laboratory Contact Information

ALS Environmental
960 W Levoy Drive
Salt Lake City, Utah 84123

Phone: (801) 266-7700
Email: als@alst.com
Web: www.alst.com



ANALYTICAL REPORT

Workorder: 34-1934611

Client: ALS Environmental
(Houston)

Project Manager: Kevin W. Griffiths

General Lab Comments

The results provided in this report relate only to the items tested.
 Samples were received in acceptable condition unless otherwise noted.
 Samples have not been blank corrected unless otherwise noted.
 This test report shall not be reproduced, except in full, without written approval of ALS.

ALS provides professional analytical services for all samples submitted. ALS is not in a position to interpret the data and assumes no responsibility for the quality of the samples submitted.

All quality control samples processed with the samples in this report yielded acceptable results unless otherwise noted.

ALS is accredited for specific fields of testing (scopes) in the following testing sectors. The quality system implemented at ALS conforms to accreditation requirements and is applied to all analytical testing performed by ALS. The following table lists testing sector, accreditation body, accreditation number and website. Please contact these accrediting bodies or your ALS project manager for the current scope of accreditation that applies to your analytical testing.

Testing Sector	Accreditation Body (Standard)	Certificate Number	Website
Environmental	PJLA (DoD ELAP)	L17-506	http://www.pjlabs.com
	PJLA (ISO 17025)	L17-507-R1	http://www.pjlabs.com
	Utah (TNI)	UT00953	http://lams.nelac-institute.org/search
	Iowa (TNI)	IA# 376	http://www.shl.uiowa.edu/labcert/idnr/
	Kansas	E-10416	http://www.kdheks.gov/envlab/disclaimer.html
Industrial Hygiene	AIHA (ISO 17025 & AIHA IHLAP)	101574	http://www.aihaaccreditedlabs.org
	DOECAP-AP	L18-606	http://www.pjlabs.com
	Washington	C596	https://ecology.wa.gov/Regulations-Permits/Permits-certifications/Laboratory-Accreditation
Dietary Supplements	PJLA (ISO 17025)	L17-507-R1	http://www.pjlabs.com

Result Symbol Definitions

MDL = Method Detection Limit, a statistical estimate of method/media/instrument sensitivity.

RL = Reporting Limit, a verified value of method/media/instrument sensitivity.

CRDL = Contract Required Detection Limit

Reg. Limit = Regulatory Limit.

ND = Not Detected, testing result not detected above the MDL or RL.

< Means this testing result is less than the numerical value.

** No result could be reported, see sample comments for details.

Qualifier Symbol Definitions

U = Qualifier indicates that the analyte was not detected above the MDL.

J = Qualifier Indicates that the analyte value is between the MDL and the RL. It is also used to indicate an estimated value for tentatively identified compounds in mass spectrometry where a 1:1 response is assumed.

B = Qualifier indicates that the analyte was detected in the blank.

E = Qualifier indicates that the analyte result exceeds calibration range.

P = Qualifier indicates that the RPD between the two columns is greater than 40%.



Quality Control Sample Batch Report

00957535

Analysis Information

Workorder: 1934611

Limits: Client SOW/Contract Specified
Basis: DoD QSM

Preparation: NA
Batch: NA
Prepared By: NA

Analysis: EPA 6850, DoD QSM
Batch: ELMS/2328 (HBN: 253958)
Analyzed By: Thomas Bosch

Blank

LMB: 689015 Analyzed: 12/19/2019 09:32 Units: ug/L			
Analyte	Result	MDL	RL
Perchlorate	ND	1	2.00

Laboratory Control Sample

LCS: 689012 Analyzed: 12/19/2019 09:04 Dilution: 1 Units: ug/L				
Analyte	Result	Target	% Rec	QC Limits
Perchlorate	3.17	3.00	106	78.8 123.8

Matrix Spike - Matrix Spike Duplicate

Sample: 1934606001 Analyzed: 12/19/2019 09:46 Dilution: 1 Units: ug/L		MS: 689016 Analyzed: 12/19/2019 10:00 Dilution: 1 Units: ug/L				MSD: 689017 Analyzed: 12/19/2019 10:14 Dilution: 1 Units: ug/L			
Analyte	Result	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits
Perchlorate	ND	2.6	3	86.8	78.8 123.8	3.06	102	16	0.0 20.0

Comments

Field sample 1934606006 was analyzed and reported from a 1:10 dilution. Field sample 1934606005 was analyzed and reported from a 1:100 dilution. Field samples 1934611003/06 were analyzed and reported from 1:1,000 dilutions. The reporting limits have been adjusted accordingly.

QC Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Analyst	Peer Review
/S/ Thomas Bosch 12/21/2019 13:06	/S/ Stephen Brose 12/23/2019 09:16

Symbols and Definitions

- * - Analyte above reporting limit or outside of control limits
- ▲ - Sample result is greater than 4 times the spike added
- - Sample and Matrix Duplicate less than 5 times the reporting limit
- - Result is above the calibration range
- # - The Matrix Spike, Matrix Spike duplicate or Matrix Duplicate is reported for your information only. The sample matrix may be inappropriate for the method selected.

- RPD - Relative % Difference (Spike / Spike Duplicate)
- ND - Not Detected (U - Qualifier also flags analyte as not detected)
- NA - Not Applicable
- QC results are not adjusted for moisture correction, where applicable



W



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

18698/#2

SAMPLING STATE: Texas

COC ID: 12798

SUBCONTRACT TO:

1934611

ALS Laboratory Group
 960 LeVoy Dr
 Salt Lake City, UT 84123

Phone: +1 801 266 7700

CUSTOMER INFORMATION:

Company: ALS Houston
Contact: RJ Modashia
Address: 10450 Stancliff Rd, Ste 210
Phone: +1 281 530 5656
Email: RJ.Modashia@alsglobal.com
Alternate Contact: Jumoke M. Lawal
Email: jumoke.lawal@alsglobal.com

INVOICE INFORMATION:

Company: ALS Houston
Contact: Accounts Payable
Address: 10450 Stancliff Rd, Ste 210
Phone: +1 281 530 5656
Reference: HS19120386
TSR: Danielle Winnings

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	HS19120386-01	18CptMW12SW_120619	Groundwater	06 Dec 2019 07:50
	SUB_Perch-6850			23 Dec 2019
2.	HS19120386-02	18CpTMW12DW_120619	Groundwater	06 Dec 2019 08:40
	SUB_Perch-6850			23 Dec 2019
3.	HS19120386-03	MW7_120619	Groundwater	06 Dec 2019 09:30
	SUB_Perch-6850			23 Dec 2019
4.	HS19120386-04	18CpTMW10SW_120619	Groundwater	06 Dec 2019 10:25
	SUB_Perch-6850			23 Dec 2019
5.	HS19120386-05	18CpTMW10DW_120619	Groundwater	06 Dec 2019 11:10
	SUB_Perch-6850			23 Dec 2019
6.	HS19120386-06	18ww17_120619	Groundwater	06 Dec 2019 11:25
	SUB_Perch-6850			23 Dec 2019

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

QC Level: DOD IV (DoD Data Package)

REPT'S SECTIONS (TODAY) (P. 1/1)



Subcontract Chain of Custody

SAMPLING STATE: Texas

COC ID: 12798

Relinquished By: _____

Date/Time: 12/10/19 18:00

Received By: _____

Date/Time: 12/11/19 0902

Cooler ID(s): _____

Temperature(s): _____

ALS-SALT LAKE CITY-RELATED INFORMATION REPORT (CRIR)

COOLER OR CONTAINER INFORMATION CHECKLIST (Fill In or Circle)

Client Name: ALS Houston Project/Task/Site: HS19120386
 Date/Time of Receipt: 12/11/19 0902 Number of Coolers Received: 1 1934611

Condition of Coolers: <u>Acceptable</u> /Unacceptable	Temperature Control: <u>Present</u> /Not Included
Cooler Custody Seals: <u>Present</u> /Absent/NA	Location Temp Taken: <u>Control</u> /Between Samples
Container Custody Seals: <u>Intact</u> /Broken/NA	Are all temperatures within project specific guidelines? Yes/No/ <u>NA</u>
Ice Present: <u>Yes</u> /No/NA	VOA Headspace Present? Yes/No/ <u>NA</u>
Container Custody Seals: Present/ <u>Absent</u> /NA	
Intact/Broken/ <u>NA</u>	
<u>Frozen</u> /Melted/NA	

pH Check Performed:	Metals Yes/No/NA	Total Phenolics Yes/No/NA	NO3/NO2 Yes/No/NA
	Cyanide Yes/No/NA	TPH - 418.1 Yes/No/NA	Oil & Grease Yes/No/NA
	Sulfide Yes/No/NA	COD Yes/No/NA	Total Phosphorous Yes/No/NA
	Ammonia Yes/No/NA	TKN Yes/No/NA	Gross A.B, Gamma Spec Yes/No/NA

Cooler Received	Cooler Condition	Temp.	Cooler Received	Cooler Condition	Temp.	Cooler Received	Cooler Condition	Temp.
1	<u>Good</u>	<u>2</u> °C	4		°C	7		°C
2		°C	5		°C	8		°C
3		°C	6		°C	9		°C

Taken By: [Signature] Signature Rebecca Wise Printed Name 12/11/19 Date

CLIENT-RELATED INFORMATION

- | | | | |
|--|---|--|---|
| <input type="checkbox"/> Missing Cooler | <input type="checkbox"/> Missing Samples/Bottles | <input type="checkbox"/> Incorrect Preservation | <input type="checkbox"/> Insufficient Sample Volume |
| <input type="checkbox"/> Cooler Conditions | <input type="checkbox"/> Broken/Leaking Samples | <input type="checkbox"/> pH Criteria Not Met | <input type="checkbox"/> Chain of Custody Problems |
| <input type="checkbox"/> Missing Paperwork | <input type="checkbox"/> Incorrect Bottle Type | <input type="checkbox"/> Residual Chlorine Present | <input type="checkbox"/> Other: |
| <input type="checkbox"/> Missing/Incorrect Bottle Labels | <input type="checkbox"/> Cooler Temperatures Out of Range | <input type="checkbox"/> Head Space in Bottles | |

BRIEFLY DESCRIBE THE PROBLEM AND THE ACTION TAKEN:

Client Notified? YES NO

Response Required Within 24 Hours

PROJECT MANAGEMENT

PROJECT MANAGER COMMENTS:

ALS Project Manager: _____ Returned to Sample Receipt by: _____ Date: _____
Printed Name Signature



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ORIGIN ID:SGRA (281) 530-5656
SHIPPING DEPT
ALS LABORATORY GROUP
10450 STANCLIFF RD
SUITE 210
HOUSTON, TX 77099
UNITED STATES US

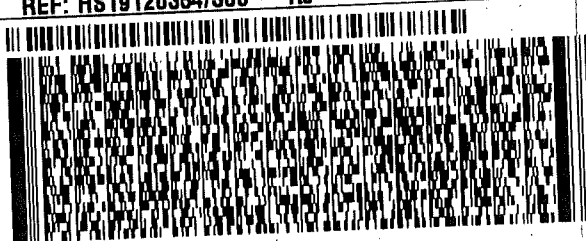
SHIP DATE: 10DEC19
ACTWGT: 18.05 LB
CAD: 300130/CAFE3211
DIMS: 14x11x10 IN
BILL THIRD PARTY

TO **SAMPLE RECEIVING
ALS ENVIRONMENTAL
960 W. LEVOY DRIVE**

SALT LAKE CITY UT 84123

(801) 288-7700

REF: HS19120354/386 - RJ



**FedEx
Express**



J18111806050104

551C2/18DD/104C

TRK# 1251 0292 7941
0201

**WED - 11 DEC 3:00P
STANDARD OVERNIGHT**

AX BTFA

**84123
US SLC**

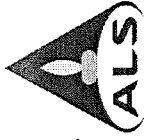




ALS Environmental CHAIN-OF-CUSTODY

Project / Job / Task: HS19120386		Split: _____		Workorder ID: 1934611		Level: ENV_LVL4		Requested Analysis																	
Client: ALS Environmental (Houston)				Account: 8101				Type: 125Poly		EPA 6950, DGD QSM															
Comments:												Preservatives		Containers											
												ID(s)		Count											
Item	Collect Date/Time	Sample ID	Lab ID	QC	Matrix																				
1	12/06/2019 07:50	18CPTMW12SW_120619	1934611001		Water																				
2	12/06/2019 08:40	18CPTMW12DW_120619	1934611002		Water																				
3	12/06/2019 09:30	MW7_120619	1934611003		Water																				
4	12/06/2019 10:25	18CPTMW10SW_120619	1934611004		Water																				
5	12/06/2019 11:10	18CPTMW10DW_120619	1934611005		Water																				
6	12/06/2019 11:25	18MW7_120619	1934611006		Water																				
7																									
8																									
9																									
10																									

ORIGINAL FIELD SAMPLE CHAIN-OF-CUSTODY										SAMPLE PREPARATION / ANALYSIS CHAIN-OF-CUSTODY														
Relinquished By: (Signature)					Date / Time					Received By: (Signature)					Date / Time					Reason for Transfer / Storage Location				
Wilcraft, Julie <i>[Signature]</i> R-33-1					12/11/2019 09:02 12/16/19 1400 12/16/19 17:05					ALS Sample Receiving LC T.B.					Sample Login Storage CLOS analysis									



Batch Worklist

HBN: 253958

Instrument:

Created: 12/19/2019 07:41

Batch: ELMS/2328

Status: WP

Analyst: T. Bosch

Rule: EPA 6850, DoD QSM Water

Workorder: 1934606 [ENV_LVL4]

Workorder: 1934611 [ENV_LVL4]

Pos	Lab ID	Sample ID	Prep Initial	Prep Final	Dust Weight	Type	Mx	Container	Procedure	Mgr	Expire Date	Due Date	Run Date
1	689011	CCV for HBN 253958 [ELMS/2328]				CCV	3		E685041C3Q	5311		12/24/2019	
2	689012	LCS for HBN 253958 [ELMS/2328]				LCS	3		E6850Q413Q	5311		12/24/2019	
3	689013	RLVS for HBN 253958 [ELMS/2328]				RLVS	3		E685041C3Q	5311		12/24/2019	
4	689014	ICS for HBN 253958 [ELMS/2328]				ICS	3		E6850.D3Q	5311		12/24/2019	
5	689015	LMB for HBN 253958 [ELMS/2328]				LMB	3		E6850Q413Q	5311		12/24/2019	
6	1934606001	18CPTMW22R_120519				SAMPLE	3	1934606001-A	E6850Q41.3	5480	1/2/2020	12/24/2019	
7	689016	18CPTMW22R_12...(1934606001MS)				MS	3		E6850Q413Q	5311		12/24/2019	
8	689017	18CPTMW22R_1...(1934606001MS D)				MSD	3		E6850Q413Q	5311		12/24/2019	
9	1934606002	MW20_120519				SAMPLE	3	1934606002-A	E6850Q41.3	5480	1/2/2020	12/24/2019	
10	1934606003	MW20_120519_a				SAMPLE	3	1934606003-A	E6850Q41.3	5480	1/2/2020	12/24/2019	
11	1934606004	18CPTMW22SW_120519				SAMPLE	3	1934606004-A	E6850Q41.3	5480	1/2/2020	12/24/2019	
12	1934606005	MW8_120519				SAMPLE	3	1934606005-A	E6850Q41.3	5480	1/2/2020	12/24/2019	
13	1934606006	MW9_120519				SAMPLE	3	1934606006-A	E6850Q41.3	5480	1/2/2020	12/24/2019	
14	1934606007	MW10_120519				SAMPLE	3	1934606007-A	E6850Q41.3	5480	1/2/2020	12/24/2019	
15	1934606008	MW17_120519				SAMPLE	3	1934606008-A	E6850Q41.3	5480	1/2/2020	12/24/2019	
16	689018	CCV for HBN 253958 [ELMS/2328]				CCV	3		E685041C3Q	5311		12/24/2019	
17	1934611001	18CPTMW12SW_120619				SAMPLE	3	1934611001-A	E6850Q41.3	5480	1/3/2020	12/24/2019	
18	1934611002	18CPTMW12DW_120619				SAMPLE	3	1934611002-A	E6850Q41.3	5480	1/3/2020	12/24/2019	
19	1934611003	MW7_120619				SAMPLE	3	1934611003-A	E6850Q41.3	5480	1/3/2020	12/24/2019	
20	1934611004	18CPTMW10SW_120619				SAMPLE	3	1934611004-A	E6850Q41.3	5480	1/3/2020	12/24/2019	
21	1934611005	18CPTMW10DW_120619				SAMPLE	3	1934611005-A	E6850Q41.3	5480	1/3/2020	12/24/2019	
22	1934611006	18WW7_120619				SAMPLE	3	1934611006-A	E6850Q41.3	5480	1/3/2020	12/24/2019	
23	689019	CCV for HBN 253958 [ELMS/2328]				CCV	3		E685041C3Q	5311		12/24/2019	



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Analytical Documentation

Analyst Write-up

ALS Work Order #'s & Sample #()'s: 1934606 (001-08); 1934611 (001-06);

ELMS Batch/HBN ID: 2328 (253958)

Prep Date: 12/16/2019 Analysis Date: 12/19/2019 Analyst: Tom Bosch

Analyte: **Perchlorate** Matrix: **Water** Method: **6850**

Sequence: \\HPCHEM\1\SEQUENCE\CLO4\2019\DEC\19DEC19D.s

Reported DL: **1.0µg/L** Reported LOD: **2.0µg/L** Reported LOQ: **4.0µg/L**

SAMPLE PREPARATION/ANALYSIS:

Water: Samples were prepared by Tom Bosch. 10.0mL of each sample was pipetted into a 15-mL centrifuge tube, and 50µL of an oxygen-18 labeled perchlorate solution was added as an internal standard. The samples were capped, vortexed, and filtered with Phenex PES membrane 0.45µm Syringe filters prior to analysis.

REAGENTS: Eluent A1: 95% ASTM Type II water (ALS)/5%ACN (B&J Lot DU461-US)/0.1% glacial acetic acid (JT-Baker Lot 122550).
Eluent B1: 95% ACN (B&J Lot DU461-US)/5% ASTM Type II water (ALS)/0.1% glacial acetic acid (JT-Baker Lot 122550).

STANDARDS: Internal Standard Spiking Solution Horizon# 47863. Dilutions of Working Standards (Horizon: 49947/48) used for ICAL, CCV's, RLVS and ICS.

CALIBRATION CURVE: Used curve from 09/20/2019, sequence 20SEP19D.s Offline Quantitation Method: CLO4-DP3.M

INSTRUMENT CONDITIONS: Samples were analyzed with an Agilent 1100 LC/MSD system, in negative SIM mode, monitoring m/z 83, 85, and 89.

Instrument ID: LCMS04 Online Acquisition Method: CLO4-AQN.M Fragmentor: 160 Output Gain: 8 Injection Volume: 35µL
Column: KP-RPPX C8 separator, 250mm Mobile Phase: 70% Eluent A1; 30% Eluent B1 Run time: 12.0min.

FLOW GRADIENT:

Time (min.)	Flow (mL/min)
0	0.65
5.8	0.65
5.9	0.25
10.3	0.25
10.5	0.65
12.0	0.65

QC DATA: 3.0µL of QC Solution Horizon ID 47516 was used for LCS 689012; Target = 3.0µg/L. ASTM type II water was used for LMB 689015.

MS/MSD: The Matrix Spike and duplicate (MS/MSD) was performed on sample 1934606001 (Client ID's: 18CPTMW22R_120519). 3.0µl of Working Standard Solution Horizon ID 49947 was added to 10.0mL of sample preparation. Spike target = 3.0µg/L.

COMMENTS:

- 1) Results reported in µg/L. Field sample 1934606006 was analyzed and reported from a 1:10 dilution. Field sample 1934606005 was analyzed and reported from a 1:100 dilution. Field samples 1934611003/06 were analyzed and reported from 1:1,000 dilutions. The reporting limits have been adjusted accordingly.
- 2) All QC, Blank, CCV, and MS/MSD results were within method parameters.
- 3) Sample data can be viewed at two directories within the ALS system: \\ALSLTWS013\LCMS\LCMS04\2019\DEC\HBN# or through NuGenesis\Tree\PrintData\LCMS\DefaultView.
- 4) Notebook: \\alsltws013\ORGANIC\BOSCH\LCMS\Perchlorates\Waters\2019\253958-DoD-ALS-Hstn LCMS4 or through \\ALSLTWS013\DATAREVIEW\HBN#
- 5) The Reporting Limit Verification Standard (RLVS – 689013) is reported from the analysis of the Laboratory Control Sample (LCS – 689012) at a level of 3.0µg/L.
- 6) Due to limitations of the Chemstation Software, some of the chromatographic peaks require manual integration. Manual Integrations were performed for one of the Initial Calibration analyses (datafile: 20SEPI03) along with datafile 19DEC19D17.

5.5 Chromatography (GC, HPLC and LC/MS) Technical Review

Note: It is the peer reviewer's responsibility to ensure that appropriate criteria are used as defined in the HORIZON PROFILE. The evaluation criteria are prioritized as per Section 2.2 of this SOP. These items must be checked for all projects. The following checklist will be completed by both the analyst and the peer reviewer and scanned into the HBN folder with the raw data.

Chromatography (GC, HPLC, LC/MS) Technical Review Criteria	Analyst Initials	Reviewer Initials
Batch(es)/SDG: <u>ELMS: 2328 HBN: 253958</u>		
Sample Set IDs if Applicable: <u>1934606/1934611</u>		
<u>Sample positions on autosampler verified against instrument sequence</u>	TB	NA
Calibration standards analyzed and meets criteria	TB	SB
Standards traceability checked and meets criteria	TB	SB
Standard curve coefficients evaluated and meet criteria	TB	SB
ICVs analyzed and meet acceptance criteria	TB	SB
CCVs analyzed and meet acceptance criteria	TB	SB
Retention Time Windows checked	—	—
For method 8081A, Endrin/DDT Breakdown is checked for compliance	—	—
Surrogate recoveries checked and appropriately addressed	TB	SB
Method Preparation Blanks analyzed and meet acceptance criteria	TB	SB
MSs, MSDs, and/or MDs analyzed and calculations checked; applicable	TB	SB
RLVS analyzed	TB	SB
Preparation and analysis hold times met	TB	SB
Preparation deviations and re-preparations noted when performed	TB	SB
Analysis deviations and re-analyses noted when performed	TB	SB
Sample dilution factors noted on reports	TB	SB
Electronic records in HBN transcription accuracy and completeness	TB	SB
Preparation and analysis calculations checked	TB	SB
NCRs are completed as necessary NC/CAR# _____	TB	SB
Report forms are complete and accurate	TB	SB
Manual integrations checked	TB	SB



STANDARD REPORT

Working Standard - CLO4ISTDWRK

CLO4ISTDWRK		Description - Perchlorate ISTD Wrk 1,000ug/L			
Standard: 49946	Created By: Thomas Bosch	Amount: 25 mL			
MFG: ALS/SLC	Create Date: 09/23/2019 03:09PM	Expires: 09/19/2020			
MFG Lot: TNB: 09/20/2019	Verified By: Thomas Bosch	Usable: Yes			
Pipette ID: Not Provided	Verify Date:	Lab Lot: CLO4ISTDWRK			
Pos.	Analyte	Name	Concentration		
1	14797-73-0-8385	Perchlorate 83:85 Ratio	1000 ug/L		
2	14797-73-0-89	Perchlorate 89	1000 ug/L		
Composition					
Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
47863	CLO4ISTDSTK	Perchlorate ISTD Stock	CLO4ISTDSTK	0.25 mL	12/05/2028



STANDARD REPORT

Constituent

Stock Standard - CLO4ISTDSTK

CLO4ISTDSTK		Description - Perchlorate ISTD Stock	
Standard: 47863		Created By: Thomas Bosch	Amount: 1 mL
MFG: Cambridge Isotope		Create Date: 05/23/2019 10:05AM	Expires: 12/05/2028
MFG Lot: SDIH-016		Verified By: Thomas Bosch	Usable: Yes
Part ID: OLM-7310-S		Verify Date:	Lab Lot: CLO4ISTDSTK
Pos.	Analyte	Name	Concentration
1	14797-73-0-8385	Perchlorate 83:85 Ratio	100 ug/mL
2	14797-73-0-89	Perchlorate 89	100 ug/mL



STANDARD REPORT

Working Standard - CLO4 WRK

CLO4 WRK		Description - 6850 WKG Std 100.ug/L			
Standard: 49948		Created By: Thomas Bosch		Amount: 10 mL	
MFG: ALS/SLC		Create Date: 09/20/2019 03:09PM		Expires: 07/25/2020	
MFG Lot: TNB: 09/20/2019				Usable: Yes	
Pipette ID: Not Provided				Lab Lot: CLO4 WRK	
Pos.	Analyte	Name	Concentration		
1	14797-73-0	Perchlorate	0.1 ug/mL		
2	14797-73-0-8385	Perchlorate 83:85 Ratio	0.1 ug/mL		
Composition					
Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
49947	CLO4 INT	6850 Intermdt AccStd 10.ug/mL	CLO4 INT	0.1 mL	07/25/2020



STANDARD REPORT

Constituent

Stock Standard - CLO4 STOCK

CLO4 STOCK		Description - 6850 Stock AccStd 1,000ug/mL	
Standard: 43659		Created By: Thomas Bosch	
MFG: AccuStandard		Create Date: 09/17/2018 09:09AM	
MFG Lot: 218065075		Expires: 07/25/2020	
Part ID: IC-PER-10X-1		Usable: Yes	
		Lab Lot: CLO4 STOCK	
Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	1000 ug/mL
2	14797-73-0-8385	Perchlorate 83:85 Ratio	1000 ug/mL



STANDARD REPORT

Constituent

Solvent Standard - ASTM H2O

ASTM H2O		Description - ASTM Type II Water	
Standard: 109	Created By: ALS Support (Lims)	Amount: 1000 L	
MFG: DCL In House	Create Date: 10/06/2005 09:10AM	Expires: 11/07/2025	
MFG Lot: Not Provided		Usable: Yes	
Part ID: Not Provided		Lab Lot: LAB 109	
Pos.	Analyte	Name	Concentration
Solvent - Analyte(s) not applicable			



STANDARD REPORT

Constituent

Working Standard - CLO4 INT

CLO4 INT		Description - 6850 Intermdt AccStd 10.ug/mL			
Standard: 49947		Created By: Thomas Bosch		Amount: 10 mL	
MFG: ALS/SLC		Create Date: 09/23/2019 03:09PM		Expires: 07/25/2020	
MFG Lot: TNB: 09/20/2019				Usable: Yes	
Pipette ID: Not Provided				Lab Lot: CLO4 INT	
Pos.	Analyte	Name	Concentration		
1	14797-73-0	Perchlorate	10 ug/mL		
2	14797-73-0-8385	Perchlorate 83:85 Ratio	10 ug/mL		
Composition					
Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
43659	CLO4 STOCK	6850 Stock AccStd 1,000ug/mL	CLO4 STOCK	0.1 mL	07/25/2020



STANDARD REPORT

Working Standard - CLO4 QC WRK

CLO4 QC WRK		Description - 6850 QC WKG STD 100ug/L			
Standard: 47516		Created By: Thomas Bosch		Amount: 10 mL	
MFG: ALS/SLC		Create Date: 05/06/2019 03:05PM		Expires: 03/31/2020	
MFG Lot: TNB: 05/06/2019				Usable: Yes	
Pipette ID: Not Provided				Lab Lot: CLO4 QC WRK 100.ug/L	
Pos.	Analyte	Name	Concentration		
1	14797-73-0	Perchlorate	100 ug/L		
Composition					
Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
47515	CLO4 QC INT	6850 QC Intrmtd Std-QC 10ug/mL	CLO4 QC INT 10.ug/mL	0.1 mL	03/31/2020



STANDARD REPORT

Constituent

Solvent Standard - ASTM H2O

ASTM H2O		Description - ASTM Type II Water	
Standard: 109	Created By: ALS Support (Lims)	Amount: 1000 L	
MFG: DCL In House	Create Date: 10/06/2005 09:10AM	Expires: 11/07/2025	
MFG Lot: Not Provided		Usable: Yes	
Part ID: Not Provided		Lab Lot: LAB 109	
Pos.	Analyte	Name	Concentration
Solvent - Analyte(s) not applicable			



STANDARD REPORT

Constituent

Stock Standard - CLO4 QCSTOCK

CLO4 QCSTOCK		Description - 6850 QC Stock STD 1,000ug/mL	
Standard: 36748	Created By: Thomas Bosch	Amount: 100 mL	
MFG: Ultra Scientific	Create Date: 05/11/2017 01:05PM	Expires: 03/31/2020	
MFG Lot: CP-0860		Usable: Yes	
Part ID: ICC-013		Lab Lot: CLO4 QC STOCK	
Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	1000 ug/mL



STANDARD REPORT

Constituent

Working Standard - CLO4 QC INT

CLO4 QC INT		Description - 6850 QC Intrmdt Std-QC 10ug/mL			
Standard: 47515		Created By: Thomas Bosch		Amount: 10 mL	
MFG: ALS/SLC		Create Date: 05/06/2019 03:05PM		Expires: 03/31/2020	
MFG Lot: TNB: 05/06/2019				Usable: Yes	
Pipette ID: Not Provided				Lab Lot: CLO4 QC INT 10.ug/mL	
Pos.	Analyte	Name	Concentration		
1	14797-73-0	Perchlorate	10 ug/mL		
Composition					
Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
36748	CLO4 QCSTOCK	6850 QC Stock STD 1,000ug/mL	CLO4 QC STOCK	0.1 mL	03/31/2020

125 Market Street
New Haven, CT 06513
USA



AccuStandard®

Tel (203)786-5290
Fax (203)786-5287
www.AccuStandard.com

CERTIFICATE OF ANALYSIS



S

AccuTrace™ Reference Standard

Catalog No: IC-PER-10X-1
Description: Perchlorate Standard
Element: Perchlorate (ClO₄)
SRM: Ind. Std.
Lot: 218065075
Matrix: Water
Hazards: Refer to SDS for complete safety information

Date Certified: Jun 25, 2018
Expiration: Jul 25, 2020
Sample Size: 100 mL
Components: 1
Storage Condition: Ambient (>5 °C)
Included on ISO/IEC 17025 Scope of Accreditation: Yes
Included on ISO 17034 Scope of Accreditation: Yes



Signal Word: None

Component	SRM #	Prepared Concentration (µg/mL)
ClO ₄ Perchlorate	Ind. Std.	1000

The gravimetric uncertainty for this product is ±0.24%.

The final solution was checked against an independent standard to verify its concentration.

We use the highest purity raw materials available to minimize impurity levels in the final solution. Typically 99.999%+ pure starting materials are used as well as ASTM Type I 18 megohm deionized water.

All solutions are filtered through a 0.2 µm filter prior to being bottled.

All glassware used in preparation is Class A and calibrated regularly.

All weights are traceable through NIST; Test No. 822-275872-11

All bottles are triple rinsed with deionized water prior to use.

Shake bottle prior to use and do not pipette directly out of the bottle. Use only cleaned Class A volumetric glassware.

We certify the accuracy of this standard to be ±0.5% of the stated value until its expiration date provided it is kept tightly capped and stored under the conditions stated above.

Certified By:

Meigan O'Leary

Meigan O'Leary, Inorganic QC Manager

Page 1 of 1

For use in routine laboratory analysis.

AccuStandard is accredited to ISO 17034, ISO/IEC 17025 and certified to ISO 9001:2015

QR-ORG/INO-001
Rev. 5/18



Certificate of Analysis



ISO Guide 34 Reference Material

Product Number: ICC-013
Lot Number: CP-0860



Lot Issue Date: 29-Feb 2016
Expiration Date: 31-Mar 2020

Product Name: Perchlorate IC Standard

Description:

This Reference Material (RM) was gravimetrically prepared in accordance with ISO Guide 34 and under ULTRA Scientific's ISO 9001 registered quality system. The neat materials used for this product have been verified by ULTRA's ISO 17025 laboratory and under ULTRA's ISO Guide 34 accreditation. The analyte concentrations were verified by ULTRA's ISO 17025 accredited laboratory. For each analyte, the true value, with its uncertainty value calculated at the 95% confidence level, is reported below.

Analyte	Starting Material	Lot Number	Purity (%)	Calculated Value	True Value	Traceability & Method
perchlorate	potassium perchlorate	RM07987	100	1001 ± 5 µg/mL	976 ± 6 µg/mL	NIST SRM 3141A; ICP-OES

Solvent: water (low TOC, < 50 ppb)

Storage: Store at Room Temperature (15° to 30°C).

Traceability:

Traceability has been established through an unbroken chain of comparisons, each having stated uncertainties. Comparisons are based on appropriate physical or chemical measurements, including gravimetric or volumetric dilution, where the mass or volume of a solution before and after dilution is measured. The balances used for these measurements are calibrated with weights traceable to NIST in compliance with ANSI/NCCL Z-540-1, ISO 9001, ISO 17025, and ISO Guide 34. Calibrated Class A glassware is used for volumetric measurements. Thermometers are calibrated against a NIST traceable thermometer in accordance with NIST Special Publication 819.

Estimation of Uncertainties:

The true value is reported, with its uncertainty value calculated at the 95% confidence level.

Homogeneity:

This RM was formulated and unitized according to an in-house procedure and is guaranteed to be homogeneous. There is no minimum sub-sample size required.

Intended Use:

This RM is intended for the preparation of working reference samples for use in routine laboratory analyses, calibration of instruments, validation of analytical methods, assessments of measurement methods and continuing calibration verification.

Instructions for Use:

Sample aliquots for analysis should be withdrawn at 20°C to 25°C immediately after opening and should be processed without delay for the true value to be valid within the stated uncertainties. Do not pipet from the bottle. Do not return any material removed for pipetting to the bottle. Tightly cap the bottle after removing any material and store according to the instructions noted above.

Hazards:

Refer to the Safety Data Sheet for information regarding this RM.

Expiration of Certification:

The certification of this RM is valid, within the measurement uncertainty specified, until the expiration date specified above, provided the RM is handled and stored in accordance with the instructions given in this certificate. This certification is nullified if the RM is damaged, contaminated, or otherwise modified.



ISO 9001 Registered Quality System – TUV USA

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Certificate of Analysis



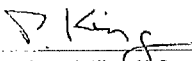
ISO Guide 34 Reference Material

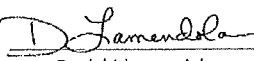
Product Number: ICC-013
Lot Number: CP-0860

Lot Issue Date: 29-Feb 2016
Expiration Date: 31-Mar 2020

Maintenance of Certification:

The real-time, long term stability of the RM may be monitored over the lifetime of the certification. If substantive changes occur that affect the certification before the expiration of this certificate, ULTRA Scientific will notify the purchaser.


Peter A. King, Ph.D.
VP, Technical Operations


Daniel J. Lamendola
Director of QA/RA



ISO 9001 Registered Quality System – TUV USA

Page 2 of 2



Cambridge Isotope Laboratories, Inc.

Certificate of Analysis



Product Name: PERCHLORIC ACID, SODIUM SALT
(Isotopic Label & Enrichment Specification) (18O4, 90%+) 100 UG/ML IN WATER

Lot Number: SDIH-016

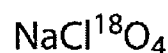
Catalog Number: OLM-7310-S

Product Information

Chemical Purity Specification: $\geq 98\%$

MW*: 130.44
* For isotopically labeled compounds, MW listed is for the fully enriched product.

Labeled CAS Number: NA



Unlabeled CAS Number: 7601-89-0

Chemical Formula: $\text{NaCl} \cdot \text{O}_4$

Storage: Store at room temperature away from light and moisture.

Stability: See storage and expiration date.

Certification

Cambridge Isotope Laboratories, Inc. guarantees that this material meets or exceeds the specifications stated. Absolute identity as well as chemical and isotopic purities are assured by the use of unambiguous synthetic routes and multiple chemical analyses whenever possible. Results are representative of QC testing at time of release from Quality Control unless otherwise stated. CIL Certificates of Analysis are occasionally updated with new data following recertification. We recommend checking the website for the latest version.

Volumetric measurements were made with Class A glassware. Gravimetry is traceable to the NIST through calibrated balances and certified, calibrated, standard weights. The calibrations are traceable to the NIST under Test No. 822/270236-04. The calibrations also meet specifications outlined in ISO 9001, ISO/IEC 17025, ANSI/NSCL Z540-1-1994, NCR Document 10CFR50 Appendix B, and applicable subdocuments.

This COA references the bulk catalog number before packaging. The COA also applies to the CIL finished good catalog number. Some possible packaging sizes and their corresponding suffix are -1.2, -1, -0.5, -10, or -0.1.

Approved by: Sashi Sivendran-Basak

Sashi Sivendran-Basak, Ph.D., Quality Review

Quality Control Tests and Results

QC Release Date	12/05/2018
Expiration Date	12/05/2028
Concentration Based on Gravimetry	100.0 \pm 1.0 $\mu\text{g/mL}$ (k=2)
Chemical Purity of Neat Material(s)	98%
LC/MS for Concentration	105.4 \pm 1.1 $\mu\text{g/mL}$ (k=2)

CIL subscribes to the following standards for different products: ISO Guide 34, ISO/IEC 17025, ISO 13485 and cGMP as appropriate.



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Batch Report: C:\HPCHEM\1\DATA\19DEC19D\19DEC19S.B

Batch Review Method:

C:\HPCHEM\1\METHODS\CLO4-DP3.M

['#' ==> Run has not been reprocessed with Batch Review Method

['*' ==> Run has been saved with batch file]

#*	Sample	Location	Inj	SampleType	Run	Perchlorate Area	Perchlorat RT	Perchlorate Amount	
*	689011	CCV@25	Vial 71	1	Control	1	1.87707e6	7.381	26.14581
*	689012	QC@3.0	Vial 72	1	Control	2	2.23679e5	7.363	3.17413
*	689014	ICS@3.0	Vial 73	1	Control	3	1.39512e5	7.308	2.74403
*	689015	LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
*	1934606001		Vial 75	1	Sample	5	0.00000	0.000	0.00000
*	689016	346061S	Vial 76	1	Sample	6	2.07557e5	7.557	2.60372
*	689017	346061D	Vial 77	1	Sample	7	2.22311e5	7.532	3.05615
*	1934606002		Vial 78	1	Sample	8	0.00000	0.000	0.00000
*	1934606003		Vial 79	1	Sample	9	0.00000	0.000	0.00000
*	1934606004		Vial 80	1	Sample	10	2.15150e6	7.296	32.85408
*	1934606005	100	Vial 81	1	Sample	11	3.24098e6	7.612	40.73782
*	1934606007		Vial 83	1	Sample	13	0.00000	0.000	0.00000
*	1934606008		Vial 84	1	Sample	14	0.00000	0.000	0.00000
*	689018	CCV@25	Vial 71	1	Control	15	1.97491e6	7.498	26.84273
*	1934611001		Vial 85	1	Sample	16	0.00000	0.000	0.00000
*	1934611002		Vial 86	1	Sample	17	4.58136e4	7.317	6.29137e-1
*	1934611003	1K	Vial 87	1	Sample	18	2.02988e6	7.589	2.47014e4
*	1934611004		Vial 88	1	Sample	19	0.00000	0.000	0.00000
*	1934611005		Vial 89	1	Sample	20	8.68103e5	7.335	9.97234
*	1934611006	1K	Vial 90	1	Sample	21	7.48762e6	7.548	7.44953e4
*	1934606006	10X	Vial 91	1	Sample	22	2.37533e6	7.561	316.86173
*	689019	CCV@25	Vial 71	1	Control	23	1.91696e6	7.460	27.03293

#*	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount	
*	689011	CCV@25	Vial 71	1	Control	1	2.44153e5	7.402	5.00000
*	689012	QC@3.0	Vial 72	1	Control	2	2.59466e5	7.387	5.00000
*	689014	ICS@3.0	Vial 73	1	Control	3	1.86819e5	7.320	5.00000
*	689015	LMB	Vial 74	1	Control	4	2.69339e5	7.513	5.00000
*	1934606001		Vial 75	1	Sample	5	2.65224e5	7.587	5.00000
*	689016	346061S	Vial 76	1	Sample	6	2.92640e5	7.567	5.00000
*	689017	346061D	Vial 77	1	Sample	7	2.67715e5	7.554	5.00000
*	1934606002		Vial 78	1	Sample	8	2.76931e5	7.411	5.00000
*	1934606003		Vial 79	1	Sample	9	3.05391e5	7.433	5.00000
*	1934606004		Vial 80	1	Sample	10	2.16695e5	7.316	5.00000
*	1934606005	100	Vial 81	1	Sample	11	2.55099e5	7.633	5.00000
*	1934606007		Vial 83	1	Sample	13	2.28101e5	7.450	5.00000
*	1934606008		Vial 84	1	Sample	14	2.11488e5	7.405	5.00000
*	689018	CCV@25	Vial 71	1	Control	15	2.49495e5	7.517	5.00000
*	1934611001		Vial 85	1	Sample	16	1.86290e5	7.300	5.00000
*	1934611002		Vial 86	1	Sample	17	2.45674e5	7.373	5.00000
*	1934611003	1K	Vial 87	1	Sample	18	2.81136e5	7.609	5000.00000
*	1934611004		Vial 88	1	Sample	19	2.29273e5	7.333	5.00000
*	1934611005		Vial 89	1	Sample	20	3.16178e5	7.352	5.00000
*	1934611006	1K	Vial 90	1	Sample	21	2.84296e5	7.567	5000.00000
*	1934606006	10X	Vial 91	1	Sample	22	2.49233e5	7.576	50.00000
*	689019	CCV@25	Vial 71	1	Control	23	2.40281e5	7.484	5.00000

#*	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount	
*	689011	CCV@25	Vial 71	1	Control	1	5.58720e5	7.396	25.58644
*	689012	QC@3.0	Vial 72	1	Control	2	7.24513e4	7.384	3.28175
*	689014	ICS@3.0	Vial 73	1	Control	3	5.46756e4	7.315	3.44509
*	689015	LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000

Batch Report: C:\HPCHEM\1\DATA\19DEC19D\19DEC19S.B

#*	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
*	1934606001	Vial 75	1	Sample	5	0.00000	0.000	0.00000
*	689016 346061S	Vial 76	1	Sample	6	6.82779e4	7.552	2.72168
*	689017 346061D	Vial 77	1	Sample	7	7.21608e4	7.553	3.16378
*	1934606002	Vial 78	1	Sample	8	0.00000	0.000	0.00000
*	1934606003	Vial 79	1	Sample	9	0.00000	0.000	0.00000
*	1934606004	Vial 80	1	Sample	10	7.41292e5	7.308	36.69916
*	1934606005 100	Vial 81	1	Sample	11	9.49000e5	7.625	39.49983
*	1934606007	Vial 83	1	Sample	13	0.00000	0.000	0.00000
*	1934606008	Vial 84	1	Sample	14	0.00000	0.000	0.00000
*	689018 CCV@25	Vial 71	1	Control	15	5.86422e5	7.511	26.21822
*	1934611001	Vial 85	1	Sample	16	0.00000	0.000	0.00000
*	1934611002	Vial 86	1	Sample	17	1.75358e4	7.393	7.24326e-1
*	1934611003 1K	Vial 87	1	Sample	18	6.01145e5	7.606	2.40455e4
*	1934611004	Vial 88	1	Sample	19	0.00000	0.000	0.00000
*	1934611005	Vial 89	1	Sample	20	2.78309e5	7.339	10.37790
*	1934611006 1K	Vial 90	1	Sample	21	2.22112e6	7.562	7.36292e4
*	1934606006 10X	Vial 91	1	Sample	22	7.03769e5	7.573	309.46591
*	689019 CCV@25	Vial 71	1	Control	23	5.62100e5	7.476	26.10541

*** End of Report ***

Sequence: C:\HPCHEM\1\SEQUENCE\CLO4\2019\DEC\19DEC19D.S

Sequence Table:

Method and Injection Info Part:

Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
====	=====	=====	=====	====	=====	=====	=====
1	Vial 71	689011	CCV@25	CLO4-AQN	1		Ctrl Samp
2	Vial 72	689012	QC@3.0	CLO4-AQN	1		Ctrl Samp
3	Vial 73	689014	ICS@3.0	CLO4-AQN	1		Ctrl Samp
4	Vial 74	689015	LMB	CLO4-AQN	1		Ctrl Samp
5	Vial 75	1934606001		CLO4-AQN	1		Sample
6	Vial 76	689016	346061S	CLO4-AQN	1		Sample
7	Vial 77	689017	346061D	CLO4-AQN	1		Sample
8	Vial 78	1934606002		CLO4-AQN	1		Sample
9	Vial 79	1934606003		CLO4-AQN	1		Sample
10	Vial 80	1934606004		CLO4-AQN	1		Sample
11	Vial 81	1934606005	100	CLO4-AQN	1		Sample
12	Vial 82	1934606006	100	CLO4-AQN	1		Sample
13	Vial 83	1934606007		CLO4-AQN	1		Sample
14	Vial 84	1934606008		CLO4-AQN	1		Sample
15	Vial 71	689018	CCV@25	CLO4-AQN	1		Ctrl Samp
16	Vial 85	1934611001		CLO4-AQN	1		Sample
17	Vial 86	1934611002		CLO4-AQN	1		Sample
18	Vial 87	1934611003	1K	CLO4-AQN	1		Sample
19	Vial 88	1934611004		CLO4-AQN	1		Sample
20	Vial 89	1934611005		CLO4-AQN	1		Sample
21	Vial 90	1934611006	1K	CLO4-AQN	1		Sample
22	Vial 91	1934606006	10X	CLO4-AQN	1		Sample
23	Vial 71	689019	CCV@25	CLO4-AQN	1		Ctrl Samp

Data file: C:\HPCHEM\1\DATA\19DEC19D\19DEC01.D

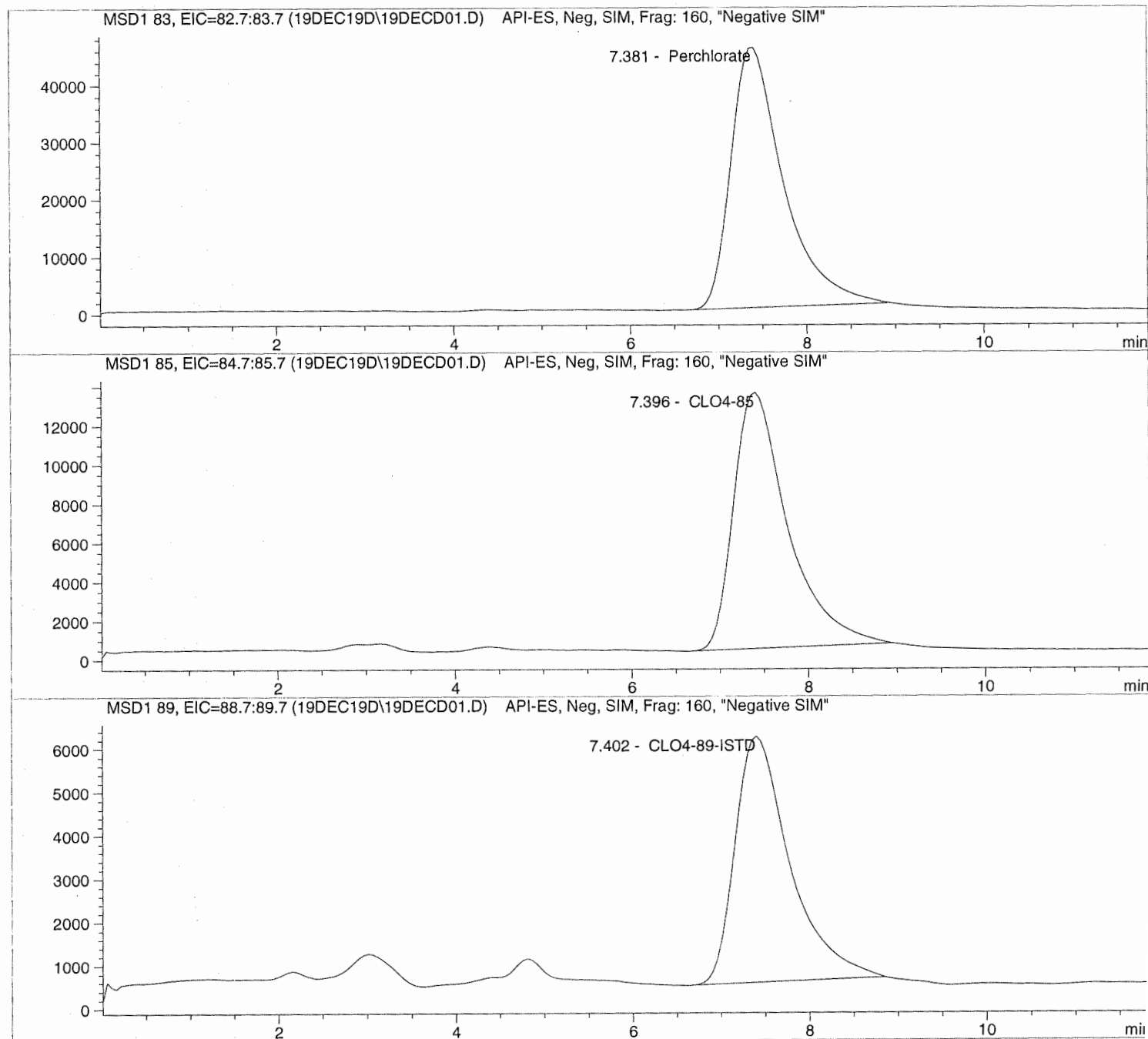
Sample Name: 689011 CCV@25

Injection Date: 12/19/2019 08:48:17
Sample Name: 689011 CCV@25
Acq Operator: TNB

Seq Line: 1
Location: Vial 71
Inj. No.: 1
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19DEC19D\19DECD01.D Sample Name: 689011 CCV@25

=====
Injection Date: 12/19/2019 08:48:17 Seq Line: 1
Sample Name: 689011 CCV@25 Location: Vial 71
Acq Operator: TNB Inj. No.: 1
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis

=====
Sample Information
=====

Sorted By: Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 25.000

=====
LCMS Results
=====

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.381	PBA	1877068.4	26.1458	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.396	PBA	558719.6	25.5864	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.402	PBA	244152.9	5.0000	CLO4-89-ISTD

=====
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19DEC19D\19DECD02.D

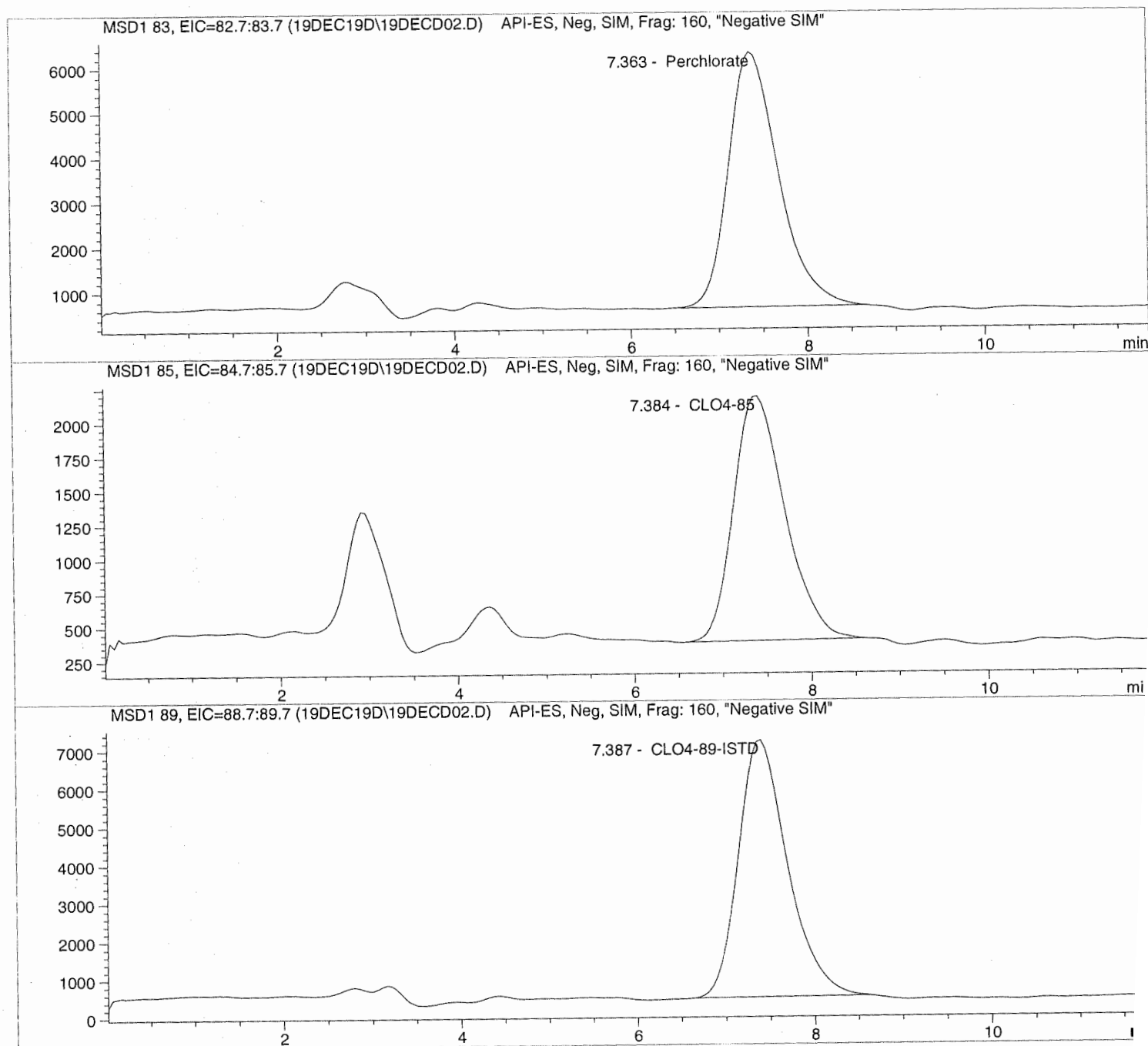
Sample Name: 689012 QC@3.0

Injection Date: 12/19/2019 09:04:49
Sample Name: 689012 QC@3.0
Acq Operator: TNB

Seq Line: 2
Location: Vial 72
Inj. No.: 1
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19DEC19D\19DECD03.D

Sample Name: 689014 ICS@3.0

Injection Date: 12/19/2019 09:18:39

Seq Line: 3

Sample Name: 689014 ICS@3.0

Location: Vial 73

Acq Operator: TNB

Inj. No.: 1

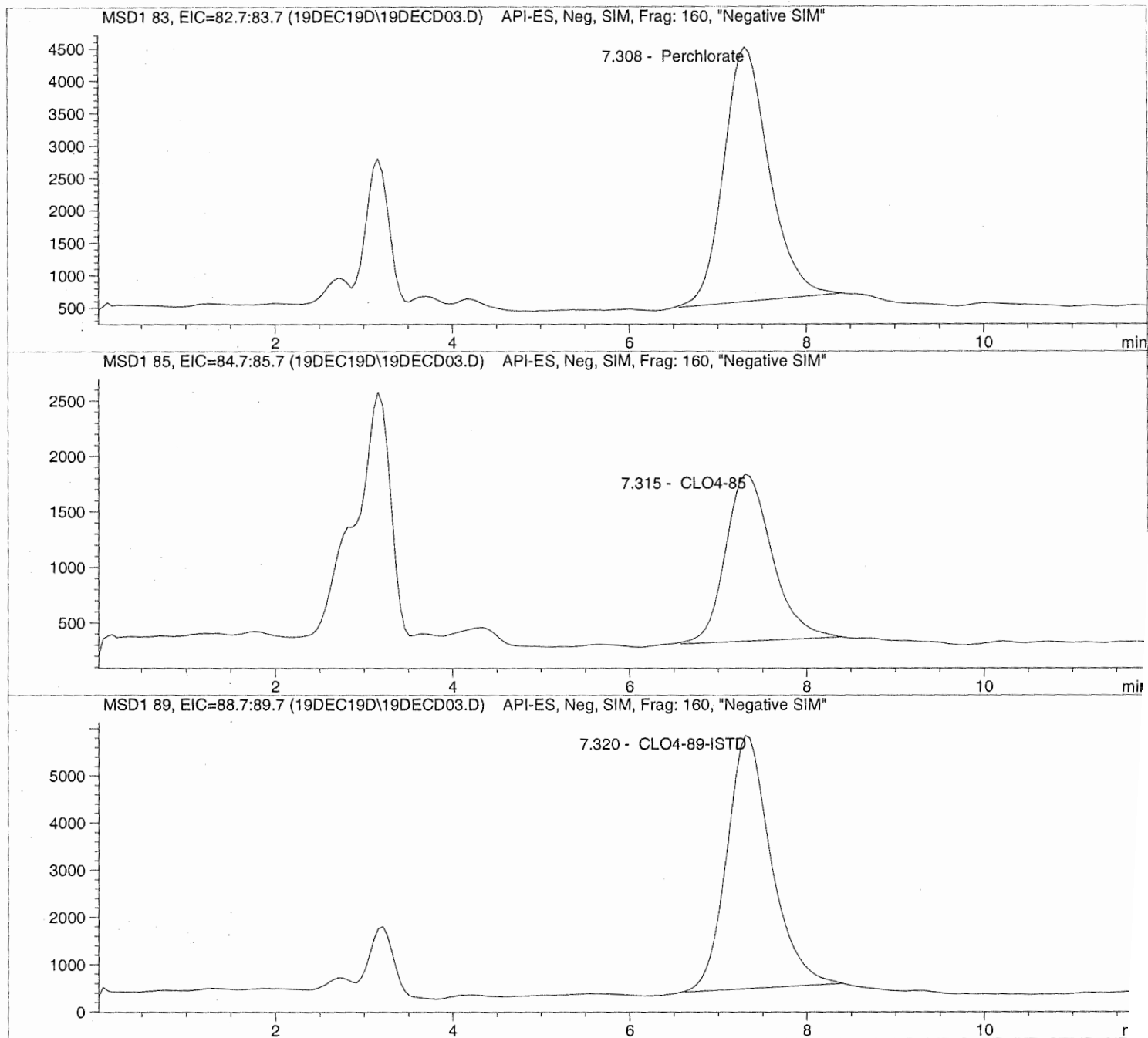
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M

Last Changed: 11/5/2019 08:44:45

Perchlorate analysis

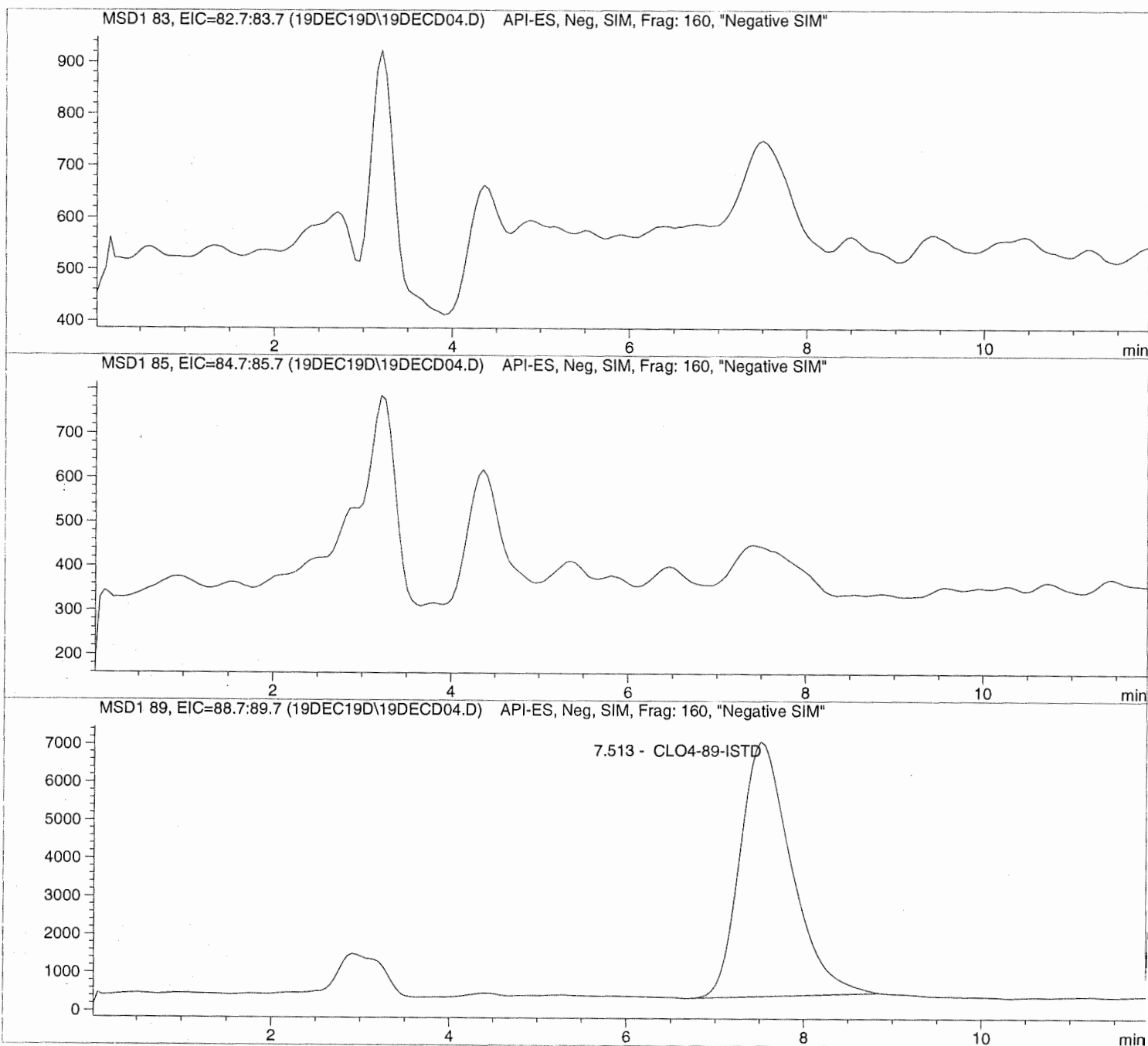


Data file: C:\HPCHEM\1\DATA\19DEC19D\19DECD04.D Sample Name: 689015 LMB

=====
Injection Date: 12/19/2019 09:32:36 Seq Line: 4
Sample Name: 689015 LMB Location: Vial 74
Acq Operator: TNB Inj. No.: 1
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis
=====



Data file: C:\HPCHEM\1\DATA\19DEC19D\19DECD04.D Sample Name: 689015 LMB

```

=====
Injection Date: 12/19/2019 09:32:36      Seq Line:          4
Sample Name:   689015 LMB                Location:         Vial 74
Acq Operator:  TNB                      Inj. No.:        1
                                           Inj. Vol.:       35 µl
=====

```

```

Acq. Method:   CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:  11/5/2019 08:44:45
=====

```

Perchlorate analysis

Sample Information

```

=====
Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:    1.000000
Dilution:      1.000000
Sample Amount: 0.000
=====

```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.513	PBA	269339.2	5.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19DEC19D\19DEC19D05.D

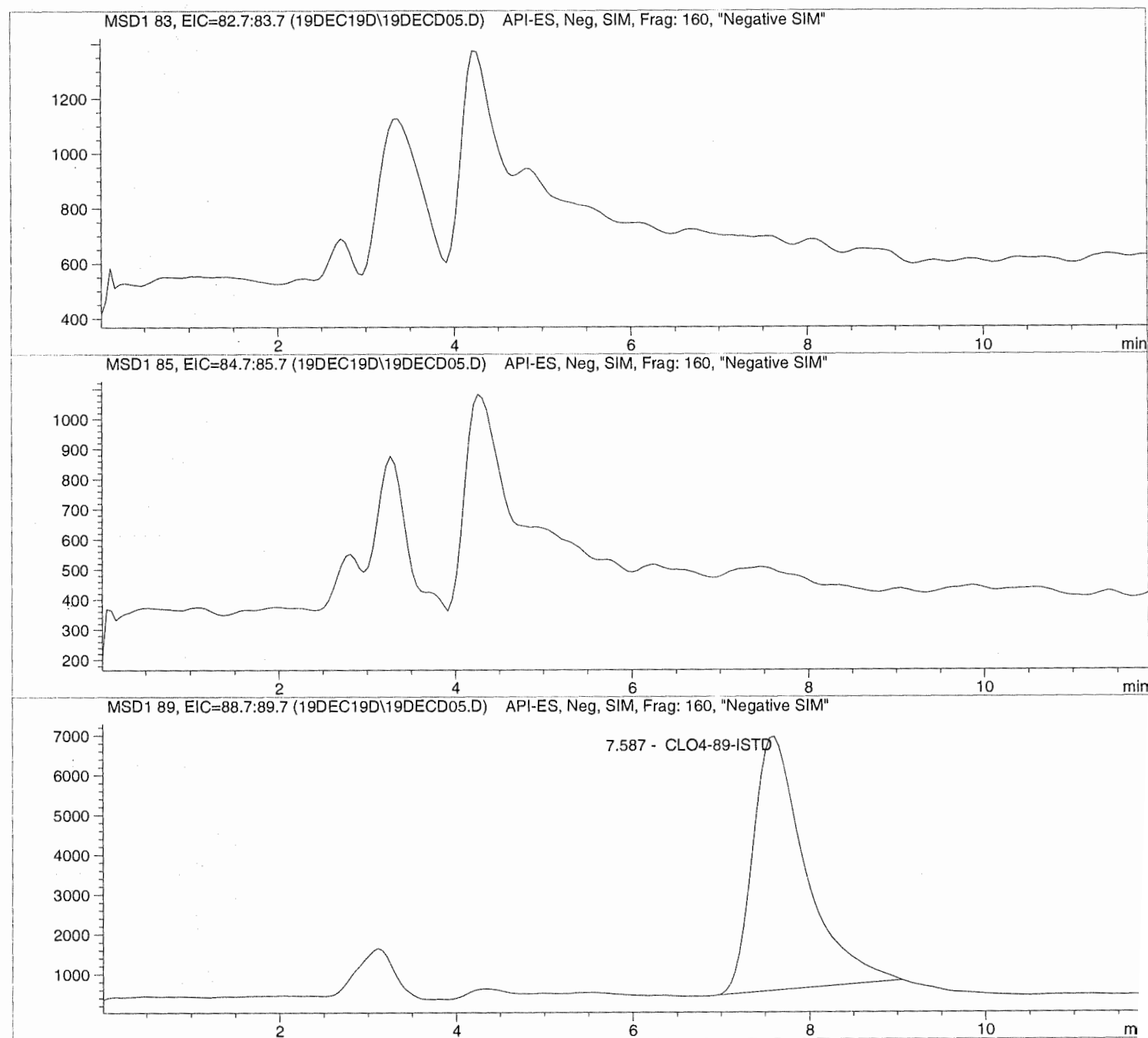
Sample Name: 1934606001

Injection Date: 12/19/2019 09:46:27
Sample Name: 1934606001
Acq Operator: TNB

Seq Line: 5
Location: Vial 75
Inj. No.: 1
Inj. Vol.: 35 μ l

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19DEC19D\19DECD05.D

Sample Name: 1934606001

```

=====
Injection Date: 12/19/2019 09:46:27      Seq Line:          5
Sample Name:   1934606001                Location:         Vial 75
Acq Operator:  TNB                       Inj. No.:        1
                                           Inj. Vol.:       35 µl
=====

```

```

Acq. Method:   CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:  11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  0.000
=====

```

```

=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.587	PBA	265223.7	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```


Data file: C:\HPCHEM\1\DATA\19DEC19D\19DECD06.D Sample Name: 689016 346061S

```

=====
Injection Date: 12/19/2019 10:00:23      Seq Line:          6
Sample Name:   689016 346061S           Location:          Vial 76
Acq Operator:  TNB                      Inj. No.:         1
                                           Inj. Vol.:       35 µl
=====

```

Acq. Method: CLO4-AQN.M
 Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
 Last Changed: 11/5/2019 08:44:45

Perchlorate analysis

=====

Sample Information

=====

```

Sorted By:          Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:        1.000000
Dilution:          1.000000
Sample Amount:     0.000
=====

```

=====

LCMS Results

=====

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.557	PBA	207557.0	2.6037	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.552	PBA	68277.9	2.7217	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.567	PBA	292639.9	5.0000	CLO4-89-ISTD

=====

*** End of Report ***

=====

Data file: C:\HPCHEM\1\DATA\19DEC19D\19DECD07.D

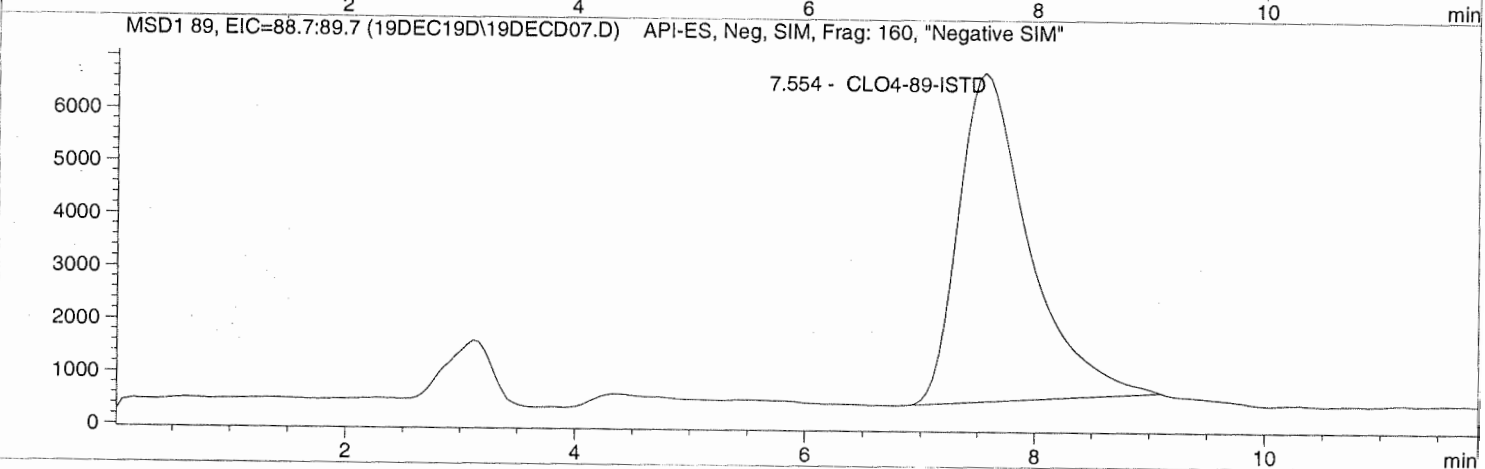
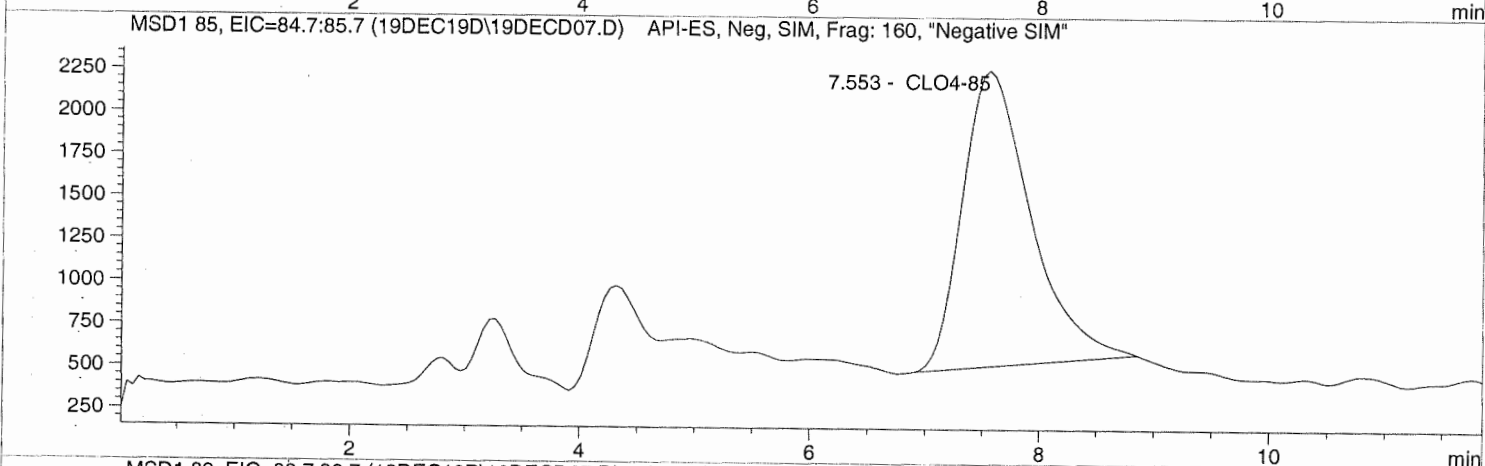
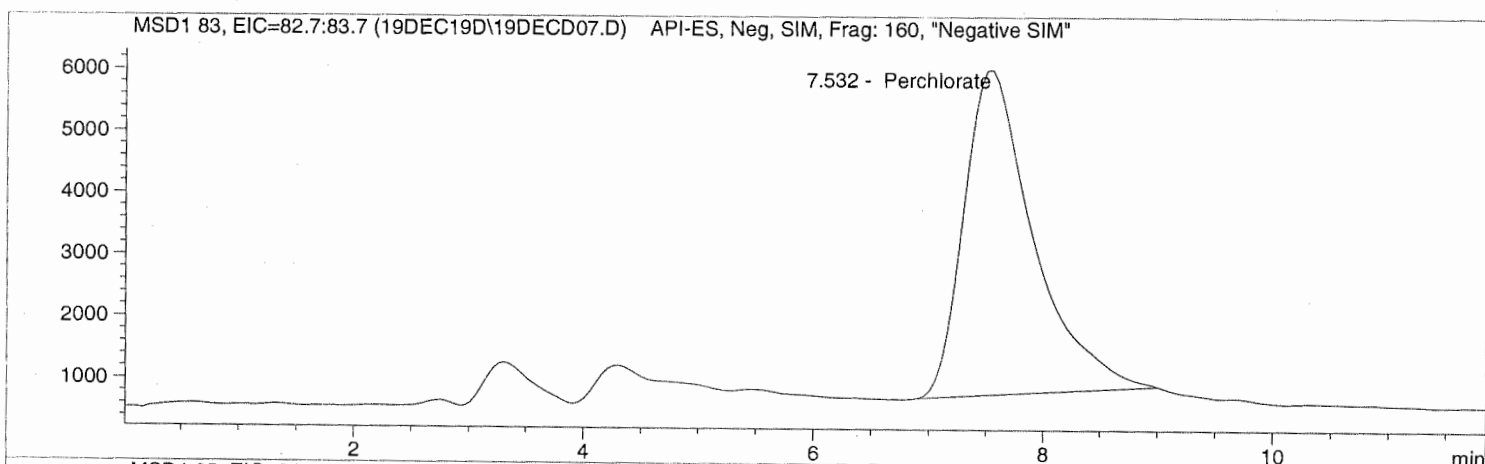
Sample Name: 689017 346061D

Injection Date: 12/19/2019 10:14:15
Sample Name: 689017 346061D
Acq Operator: TNB

Seq Line: 7
Location: Vial 77
Inj. No.: 1
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19DEC19D\19DECD07.D Sample Name: 689017 346061D

```

=====
Injection Date: 12/19/2019 10:14:15      Seq Line:          7
Sample Name:   689017 346061D           Location:         Vial 77
Acq Operator:  TNB                      Inj. No.:        1
                                           Inj. Vol.:       35 µl
=====

```

```

Acq. Method:   CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:  11/5/2019 08:44:45
=====

```

Perchlorate analysis

Sample Information

```

=====
Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:    1.000000
Dilution:      1.000000
Sample Amount: 0.000
=====

```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.532	PBA	222311.3	3.0561	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.553	PBA	72160.8	3.1638	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.554	PBA	267715.4	5.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19DEC19D\19DECD08.D

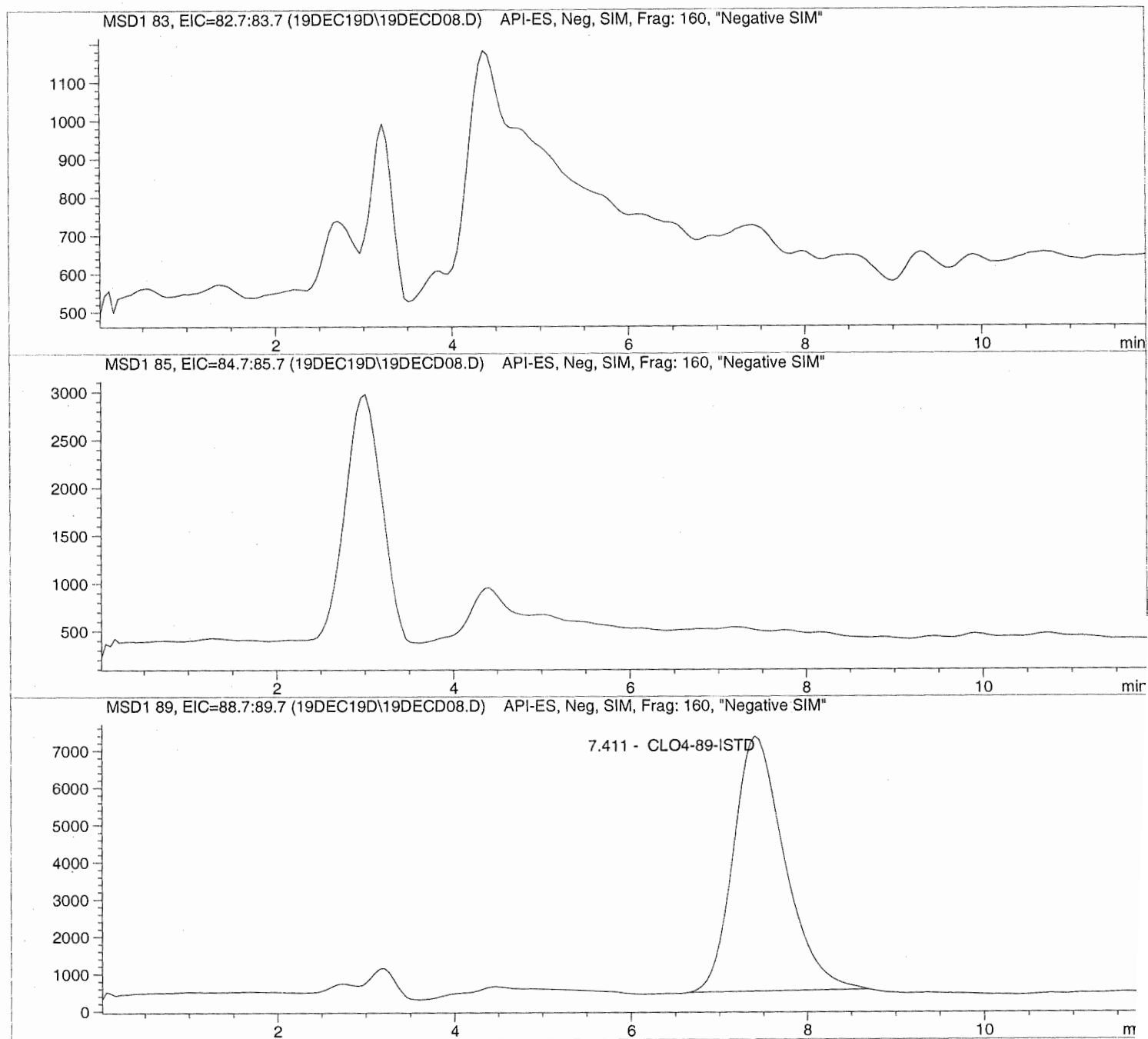
Sample Name: 1934606002

=====
Injection Date: 12/19/2019 10:28:07
Sample Name: 1934606002
Acq Operator: TNB

Seq Line: 8
Location: Vial 78
Inj. No.: 1
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19DEC19D\19DEC19D08.D Sample Name: 1934606002

```
=====
Injection Date: 12/19/2019 10:28:07      Seq Line:      8
Sample Name:    1934606002                Location:      Vial 78
Acq Operator:   TNB                       Inj. No.:     1
                                           Inj. Vol.:    35 µl
=====
```

```
Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   11/5/2019 08:44:45
```

Perchlorate analysis

Sample Information

```
Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  0.000
```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.411	PBA	276930.6	5.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19DEC19D\19DECD09.D

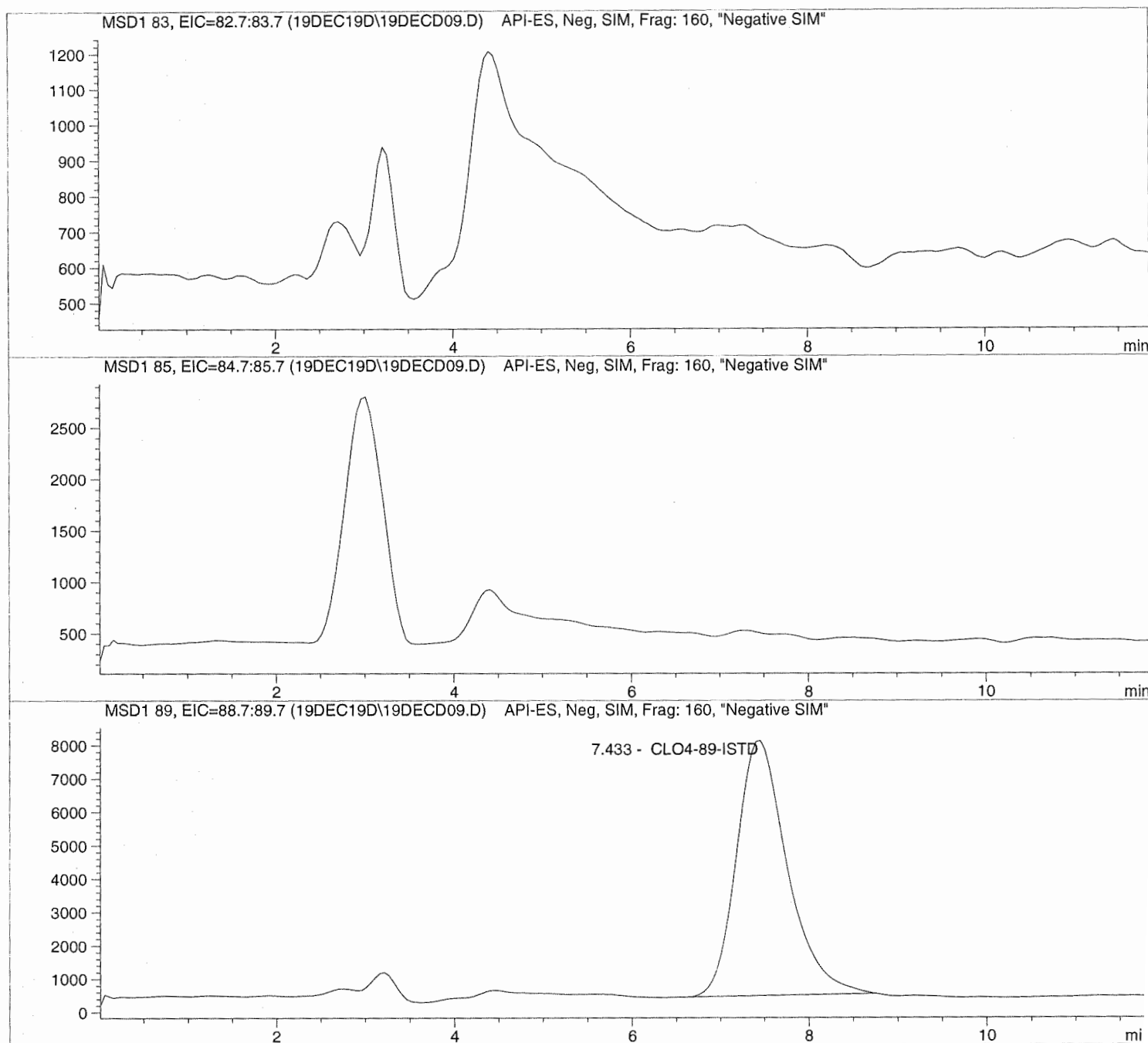
Sample Name: 1934606003

Injection Date: 12/19/2019 10:42:00
Sample Name: 1934606003
Acq Operator: TNB

Seq Line: 9
Location: Vial 79
Inj. No.: 1
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19DEC19D\19DECD09.D

Sample Name: 1934606003

```

=====
Injection Date: 12/19/2019 10:42:00      Seq Line:          9
Sample Name:    1934606003                Location:          Vial 79
Acq Operator:   TNB                       Inj. No.:         1
                                           Inj. Vol.:        35 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  0.000
=====

```

```

=====
                          LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.433	PBA	305391.4	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\19DEC19D\19DECD10.D

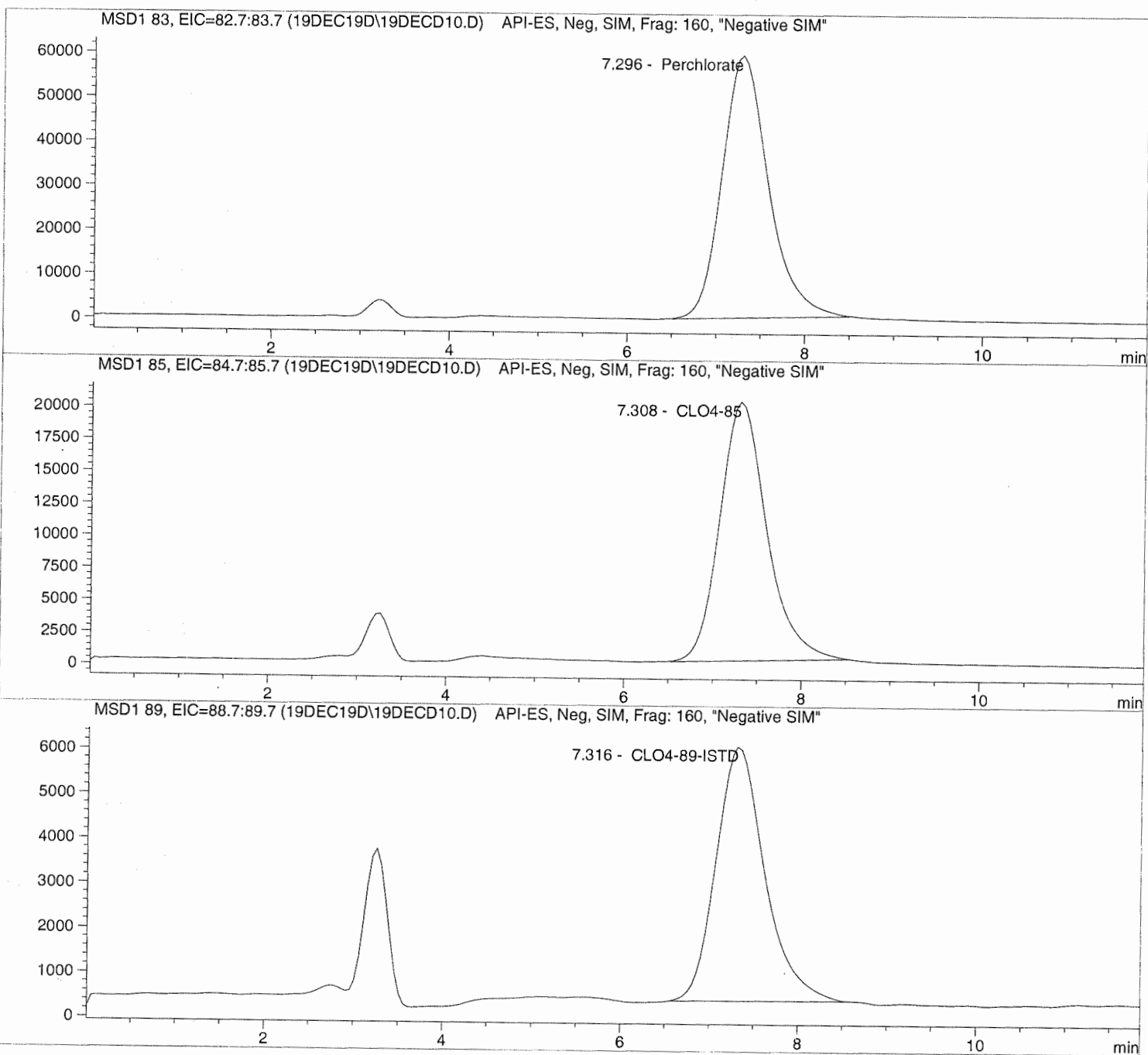
Sample Name: 1934606004

=====
Injection Date: 12/19/2019 10:55:56
Sample Name: 1934606004
Acq Operator: TNB

Seq Line: 10
Location: Vial 80
Inj. No.: 1
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19DEC19D\19DECD10.D Sample Name: 1934606004

```

=====
Injection Date: 12/19/2019 10:55:56      Seq Line: 10
Sample Name: 1934606004                  Location: Vial 80
Acq Operator: TNB                         Inj. No.: 1
                                           Inj. Vol.: 35 µl
=====

```

```

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By: Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 0.000
=====

```

```

=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.296	PBA	2151495.3	32.8541	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.308	PBA	741292.4	36.6992	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.316	PBA	216694.7	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

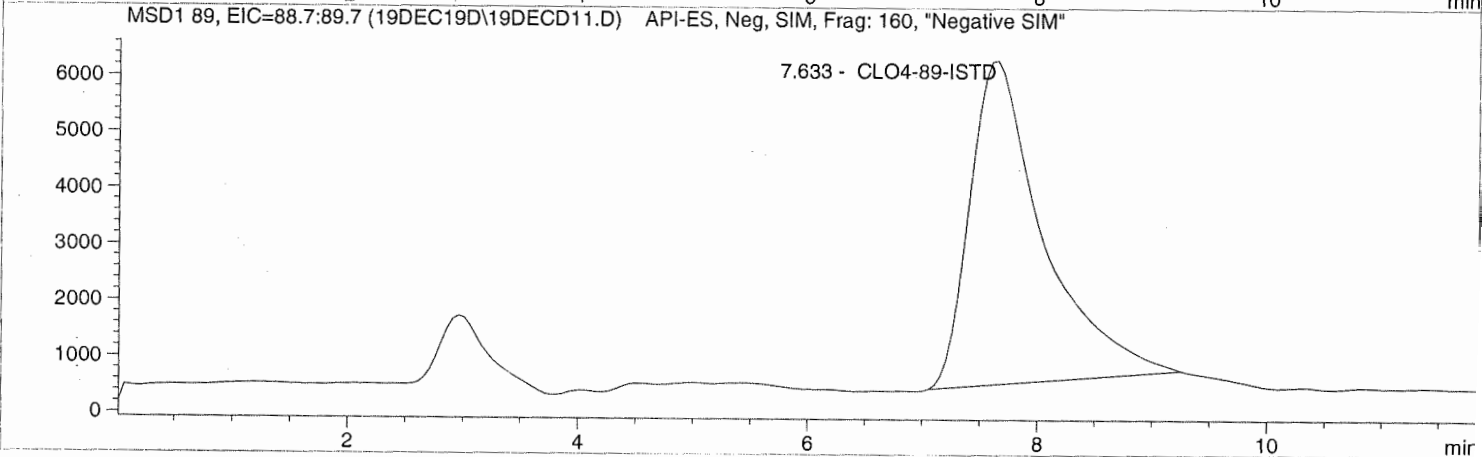
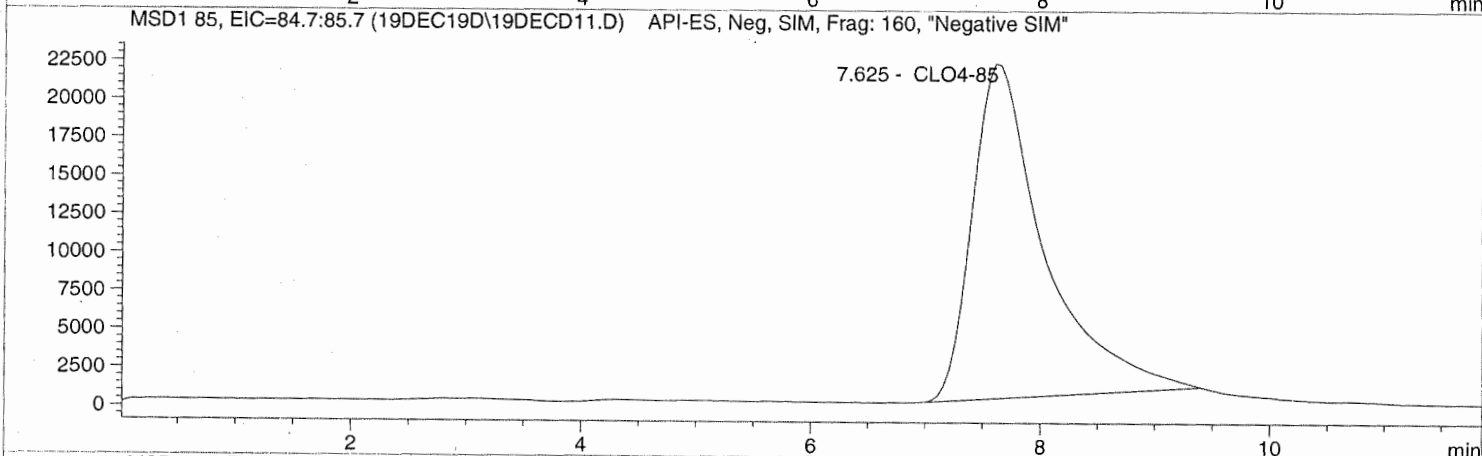
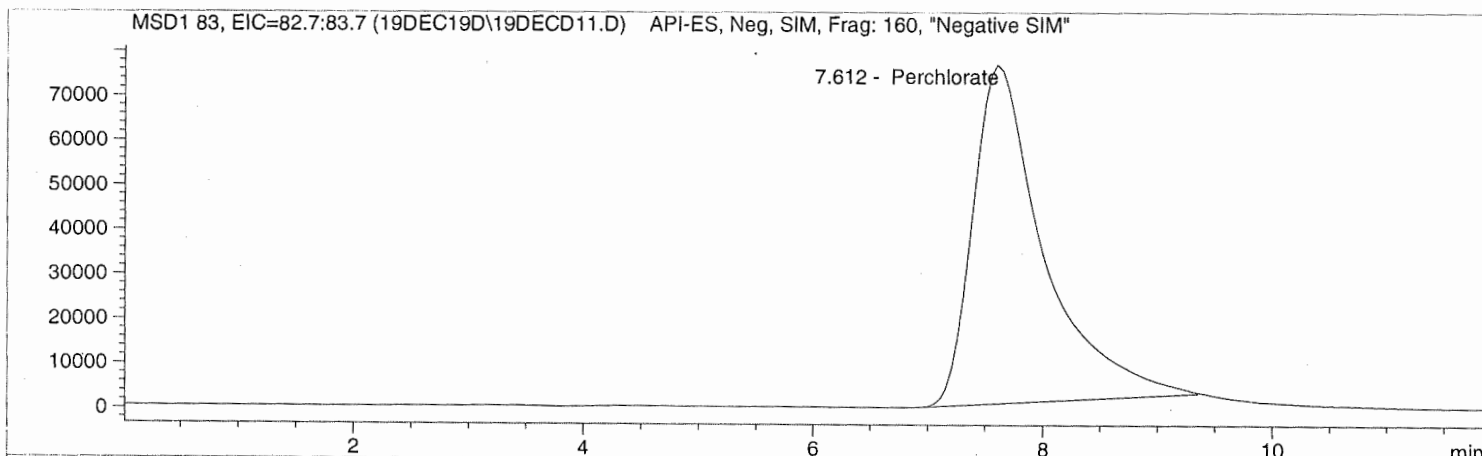
```

Data file: C:\HPCHEM\1\DATA\19DEC19D\19DECD11.D Sample Name: 1934606005 100

Injection Date: 12/19/2019 11:09:50 Seq Line: 11
Sample Name: 1934606005 100 Location: Vial 81
Acq Operator: TNB Inj. No.: 1
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19DEC19D\19DECD11.D Sample Name: 1934606005 100

```

=====
Injection Date: 12/19/2019 11:09:50      Seq Line:          11
Sample Name:   1934606005 100           Location:         Vial 81
Acq Operator:  TNB                      Inj. No.:        1
                                           Inj. Vol.:       35 µl
  
```

```

Acq. Method:   CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:  11/5/2019 08:44:45
  
```

Perchlorate analysis

Sample Information

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:    1.000000
Dilution:     100 TB 1.000000
Sample Amount: 12.20 µl 0.000
  
```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.612	PBA	3240977.8	40.7378	Perchlorate $\times 100$

4,073.78

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.625	PBA	949000.1	39.4998	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.633	PBA	255099.2	5.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19DEC19D\19DECD13.D

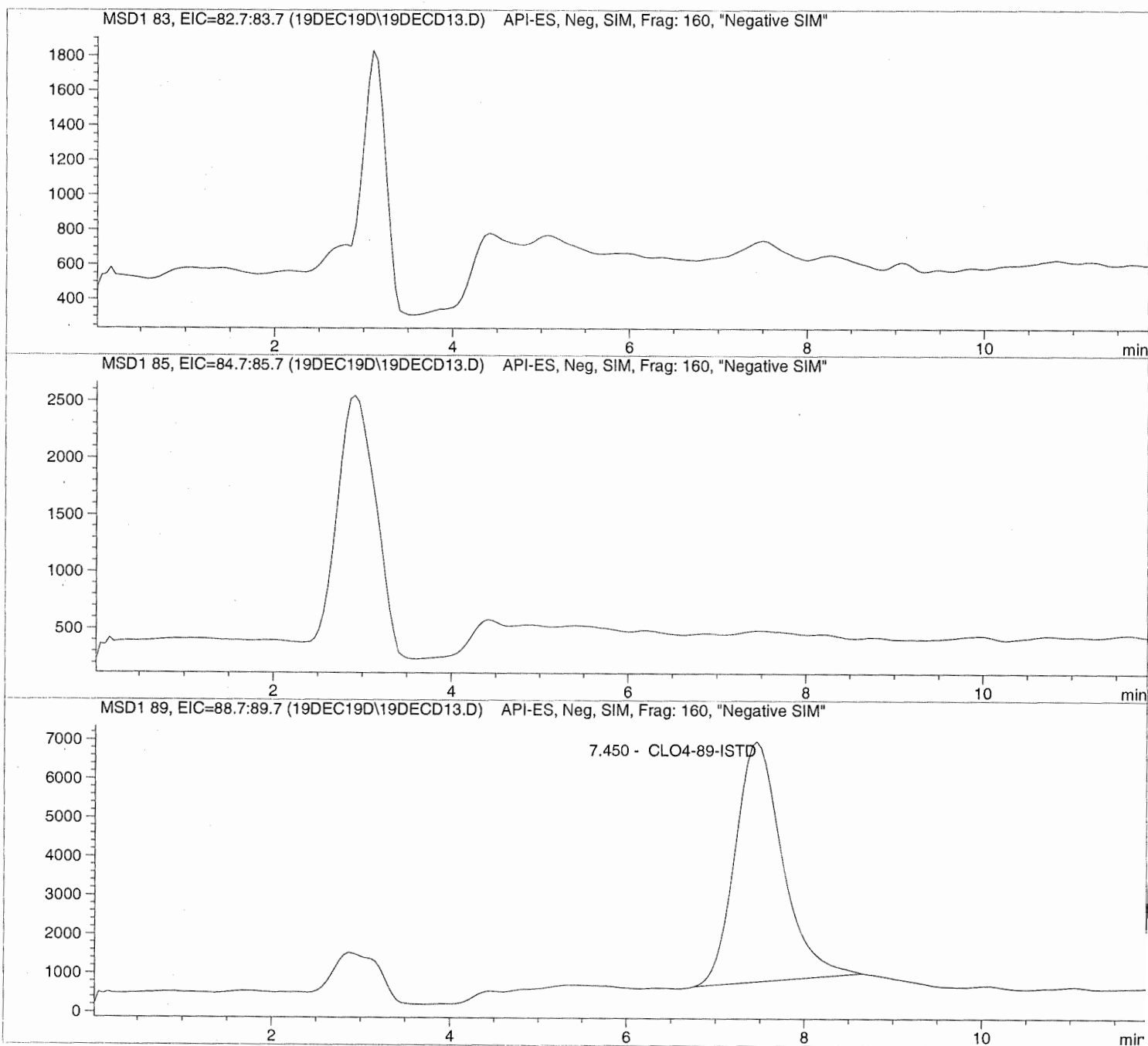
Sample Name: 1934606007

Injection Date: 12/19/2019 11:37:31
Sample Name: 1934606007
Acq Operator: TNB

Seq Line: 13
Location: Vial 83
Inj. No.: 1
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19DEC19D\19DECD13.D

Sample Name: 1934606007

```

=====
Injection Date: 12/19/2019 11:37:31      Seq Line: 13
Sample Name: 1934606007                  Location: Vial 83
Acq Operator: TNB                         Inj. No.: 1
                                           Inj. Vol.: 35 µl
=====

```

```

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By: Signal
Calib. Data Modified: Mon, 23. Sep. 2019, 00:20:59 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 0.000
=====

```

```

=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.450	PBA	228101.0	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\19DEC19D\19DECD14.D

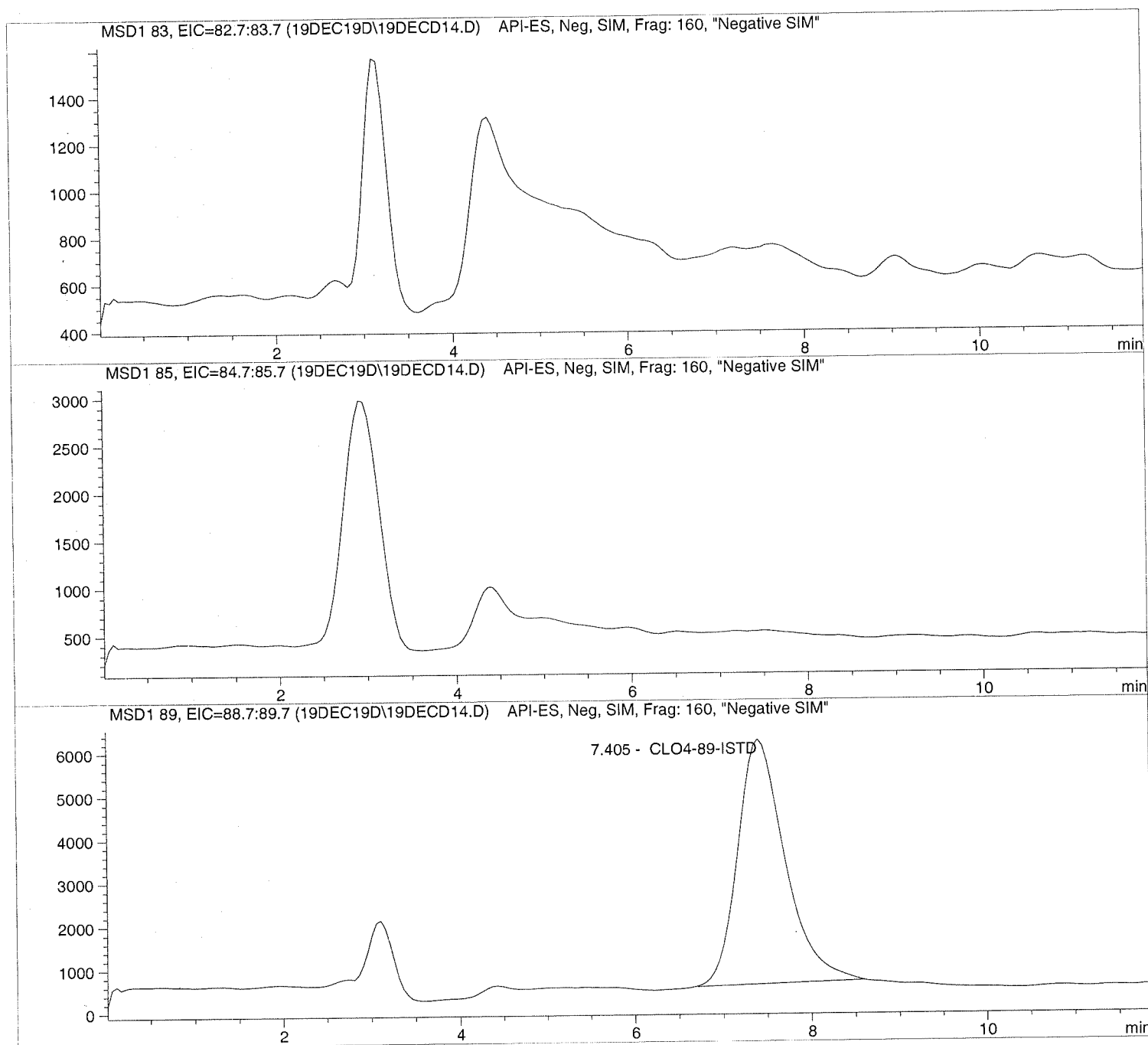
Sample Name: 1934606008

Injection Date: 12/19/2019 11:51:28
Sample Name: 1934606008
Acq Operator: TNB

Seq Line: 14
Location: Vial 84
Inj. No.: 1
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19DEC19D\19DECD14.D Sample Name: 1934606008

```
=====
Injection Date: 12/19/2019 11:51:28      Seq Line: 14
Sample Name: 1934606008                  Location: Vial 84
Acq Operator: TNB                        Inj. No.: 1
                                           Inj. Vol.: 35 µl
=====
```

```
Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45
```

Perchlorate analysis

Sample Information

```
Sorted By: Signal
Calib. Data Modified: Mon, 23. Sep. 2019, 00:20:59 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 0.000
```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.405	BBA	211488.5	5.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19DEC19D\19DECD15.D

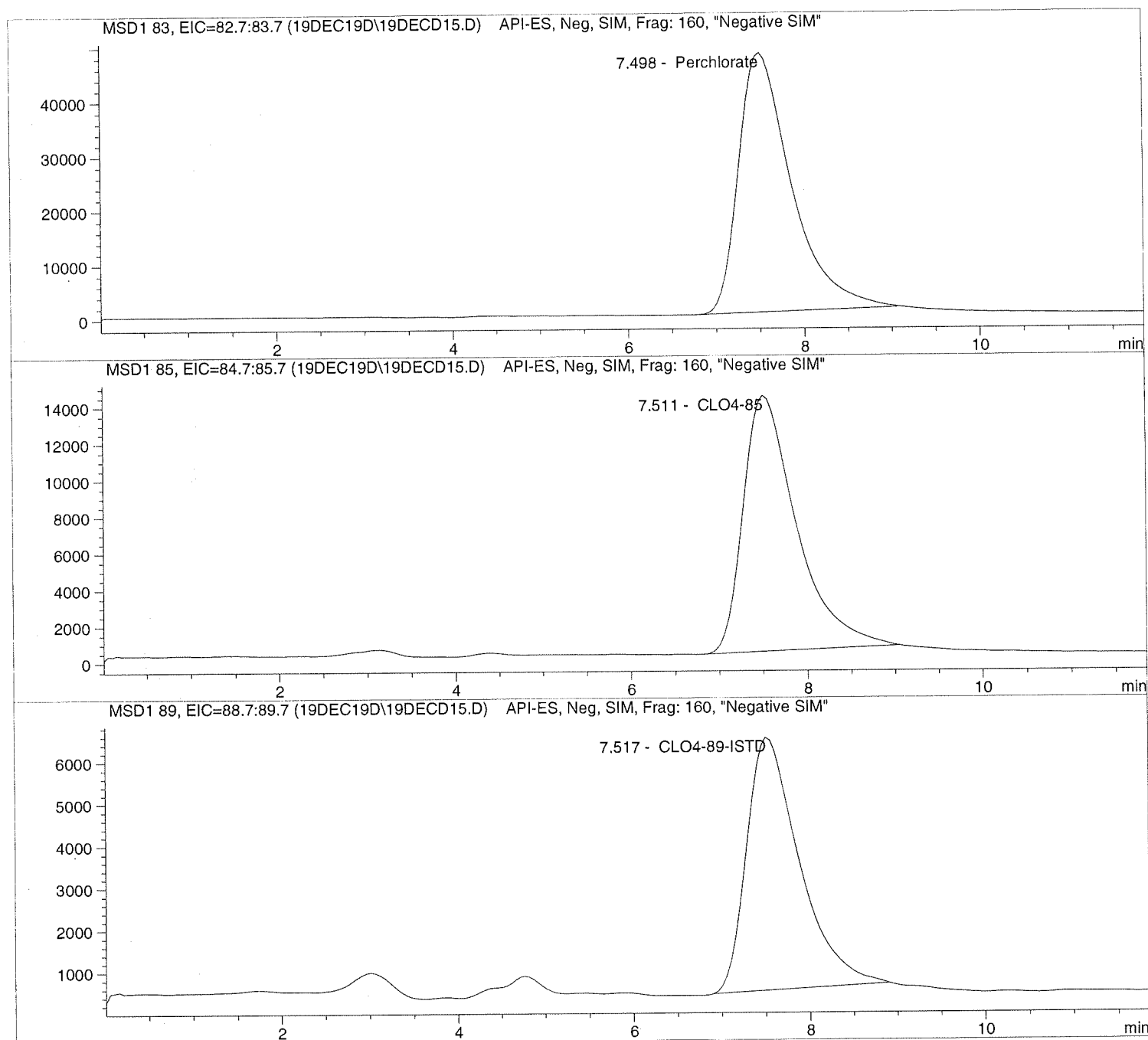
Sample Name: 689018 CCV@25

Injection Date: 12/19/2019 12:05:21
Sample Name: 689018 CCV@25
Acq Operator: TNB

Seq Line: 15
Location: Vial 71
Inj. No.: 1
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19DEC19D\19DECD15.D Sample Name: 689018 CCV@25

Injection Date: 12/19/2019 12:05:21 Seq Line: 15
 Sample Name: 689018 CCV@25 Location: Vial 71
 Acq Operator: TNB Inj. No.: 1
 Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M
 Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
 Last Changed: 11/5/2019 08:44:45

Perchlorate analysis

Sample Information

Sorted By: Signal
 Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
 Multiplier: 1.000000
 Dilution: 1.000000
 Sample Amount: 25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.498	PBA	1974913.9	26.8427	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.511	PBA	586422.3	26.2182	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.517	PBA	249494.6	5.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19DEC19D\19DECD16.D

Sample Name: 1934611001

Injection Date: 12/19/2019 12:19:13

Seq Line: 16

Sample Name: 1934611001

Location: Vial 85

Acq Operator: TNB

Inj. No.: 1

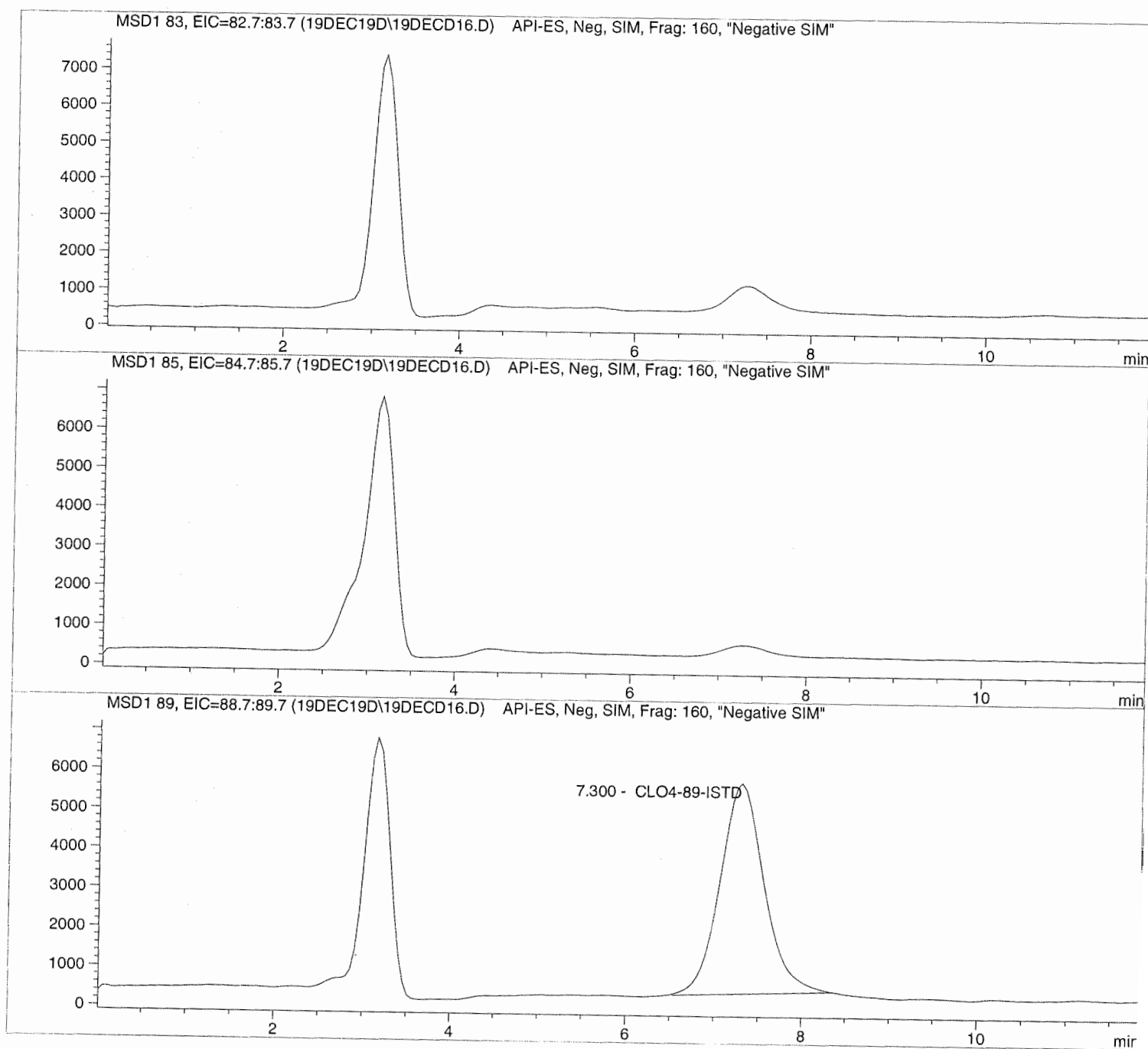
Inj. Vol.: 35 μ l

Acq. Method: CLO4-AQN.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M

Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19DEC19D\19DECD16.D Sample Name: 1934611001

```

=====
Injection Date: 12/19/2019 12:19:13      Seq Line:          16
Sample Name:    1934611001              Location:         Vial 85
Acq Operator:   TNB                     Inj. No.:        1
                                           Inj. Vol.:       35 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   11/5/2019 08:44:45
=====

```

Perchlorate analysis

Sample Information

```

=====
Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  0.000
=====

```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.300	BBA	186290.0	5.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19DEC19D\19DECD17.D

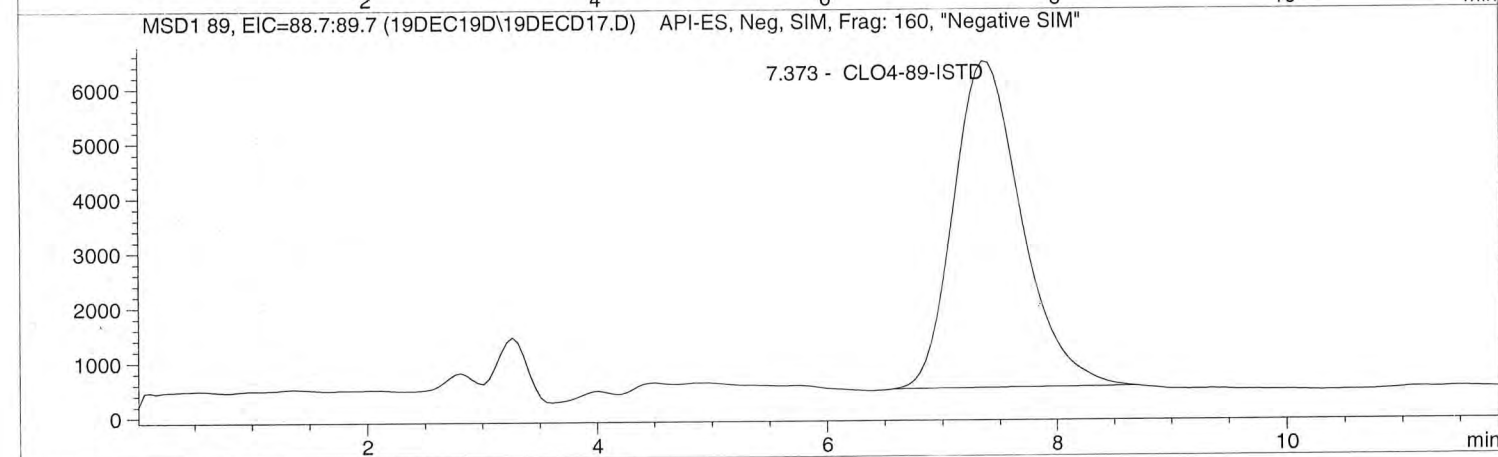
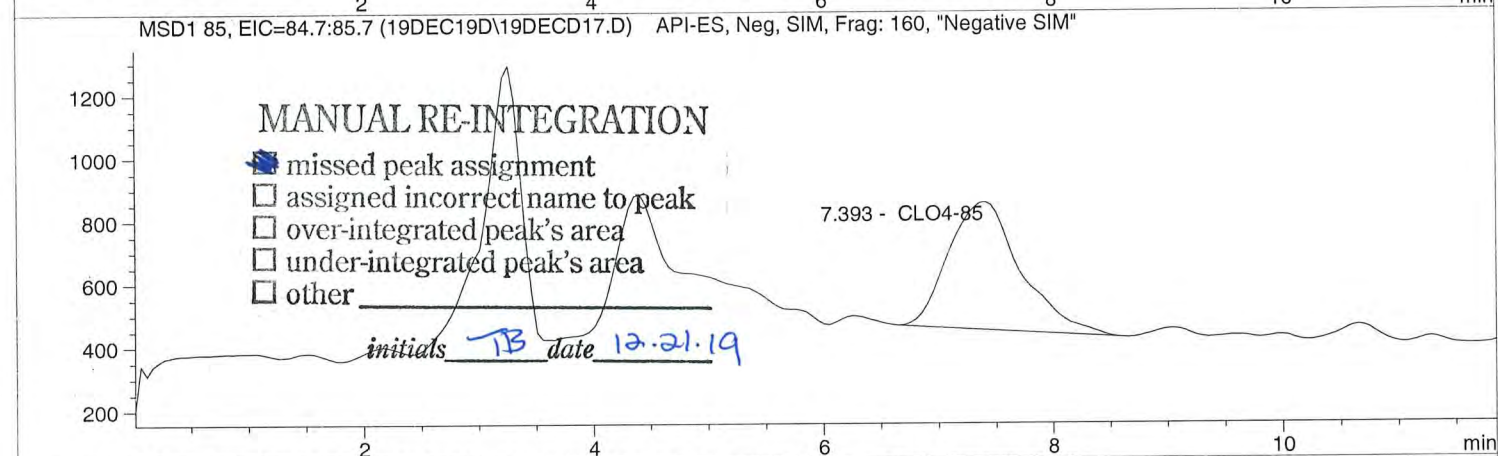
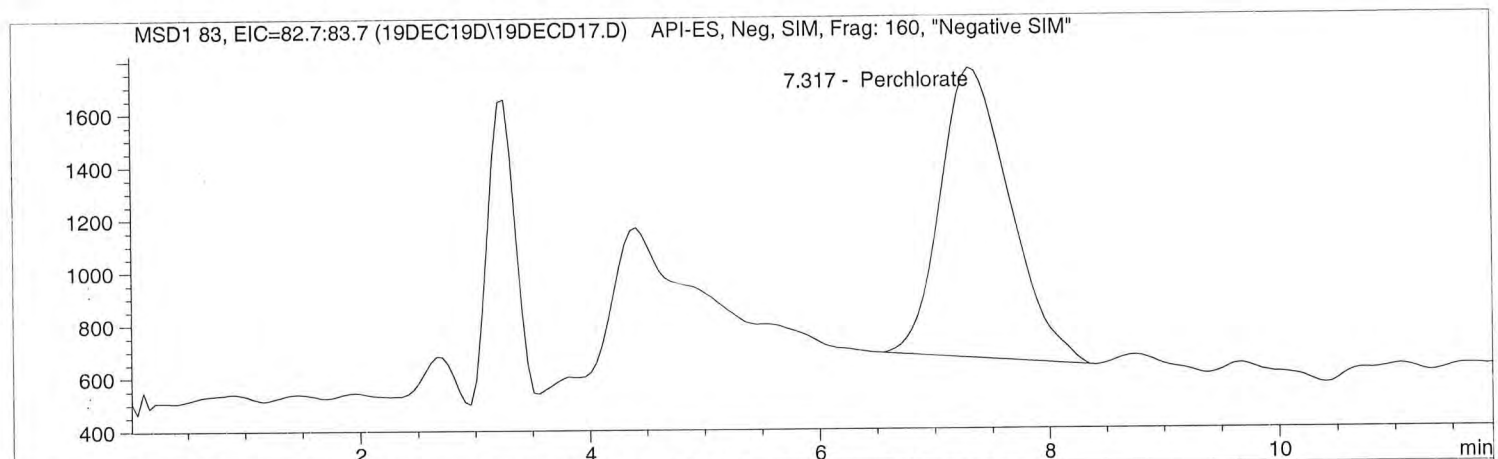
Sample Name: 1934611002

Injection Date: 12/19/2019 12:33:05
Sample Name: 1934611002
Acq Operator: TNB

Seq Line: 17
Location: Vial 86
Inj. No.: 1
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19DEC19D\19DECD17.D Sample Name: 1934611002

```

=====
Injection Date: 12/19/2019 12:33:05      Seq Line: 17
Sample Name: 1934611002                  Location: Vial 86
Acq Operator: TNB                        Inj. No.: 1
                                           Inj. Vol.: 35 µl
=====

```

```

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By: Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 0.000
=====

```

```

=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.317	PBA	45813.6	0.6291	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.393	MM	17535.8	0.7243	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.373	PBA	245674.1	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\19DEC19D\19DECD18.D

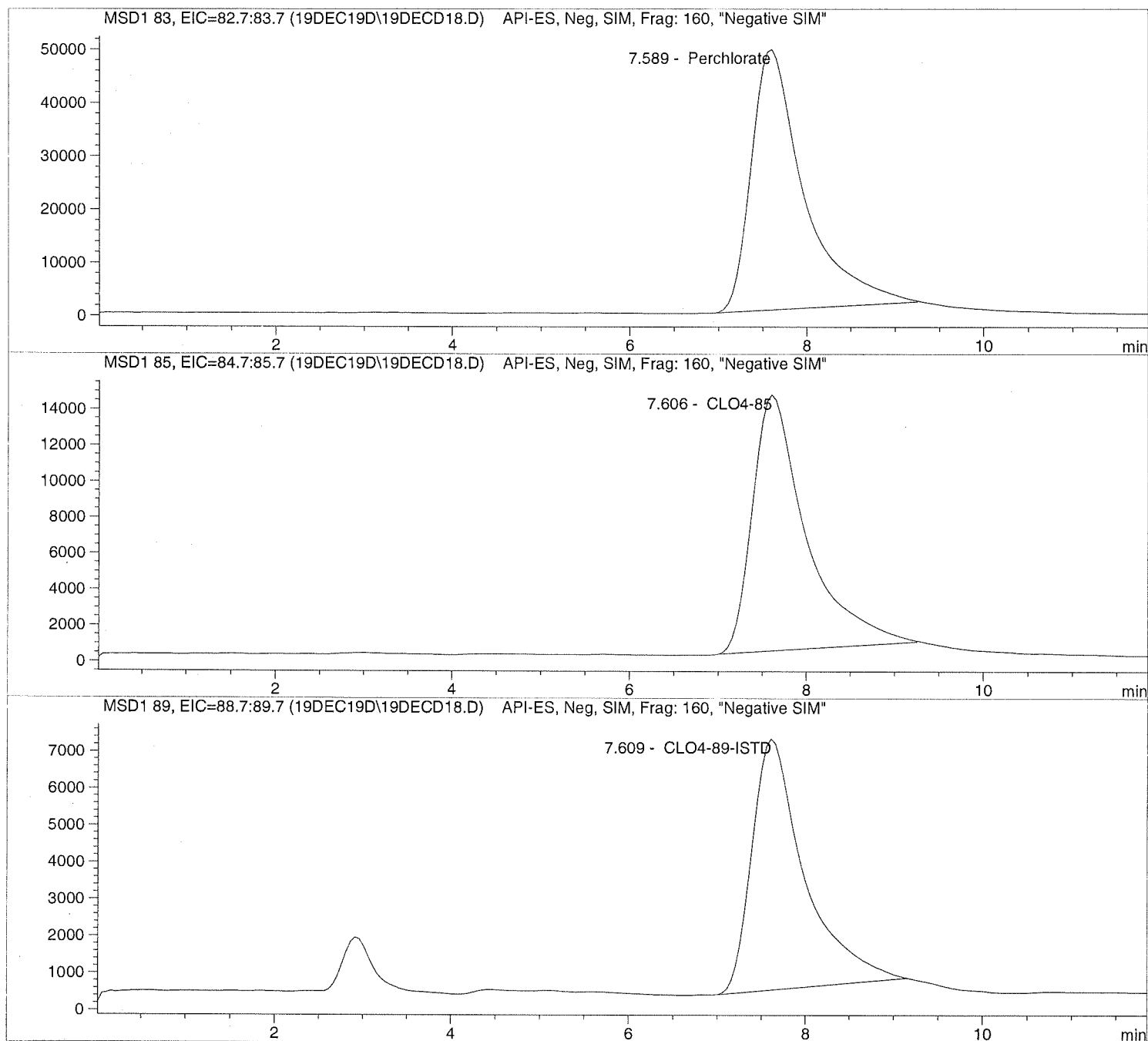
Sample Name: 1934611003 1K

Injection Date: 12/19/2019 12:46:55
Sample Name: 1934611003 1K
Acq Operator: TNB

Seq Line: 18
Location: Vial 87
Inj. No.: 1
Inj. Vol.: 35 μ l

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19DEC19D\19DECD18.D Sample Name: 1934611003 1K

```

=====
Injection Date: 12/19/2019 12:46:55      Seq Line:          18
Sample Name:    1934611003 1K           Location:          Vial 87
Acq Operator:   TNB                     Inj. No.:         1
                                           Inj. Vol.:       35 µl
  
```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   11/5/2019 08:44:45
  
```

Perchlorate analysis

Sample Information

```

=====
Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1000.000000
Sample Amount:  0.000
  
```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.589	PBA	2029878.7	24701.4141	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.606	PBA	601144.7	24045.5273	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.609	PBA	281136.2	5000.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19DEC19D\19DECD19.D

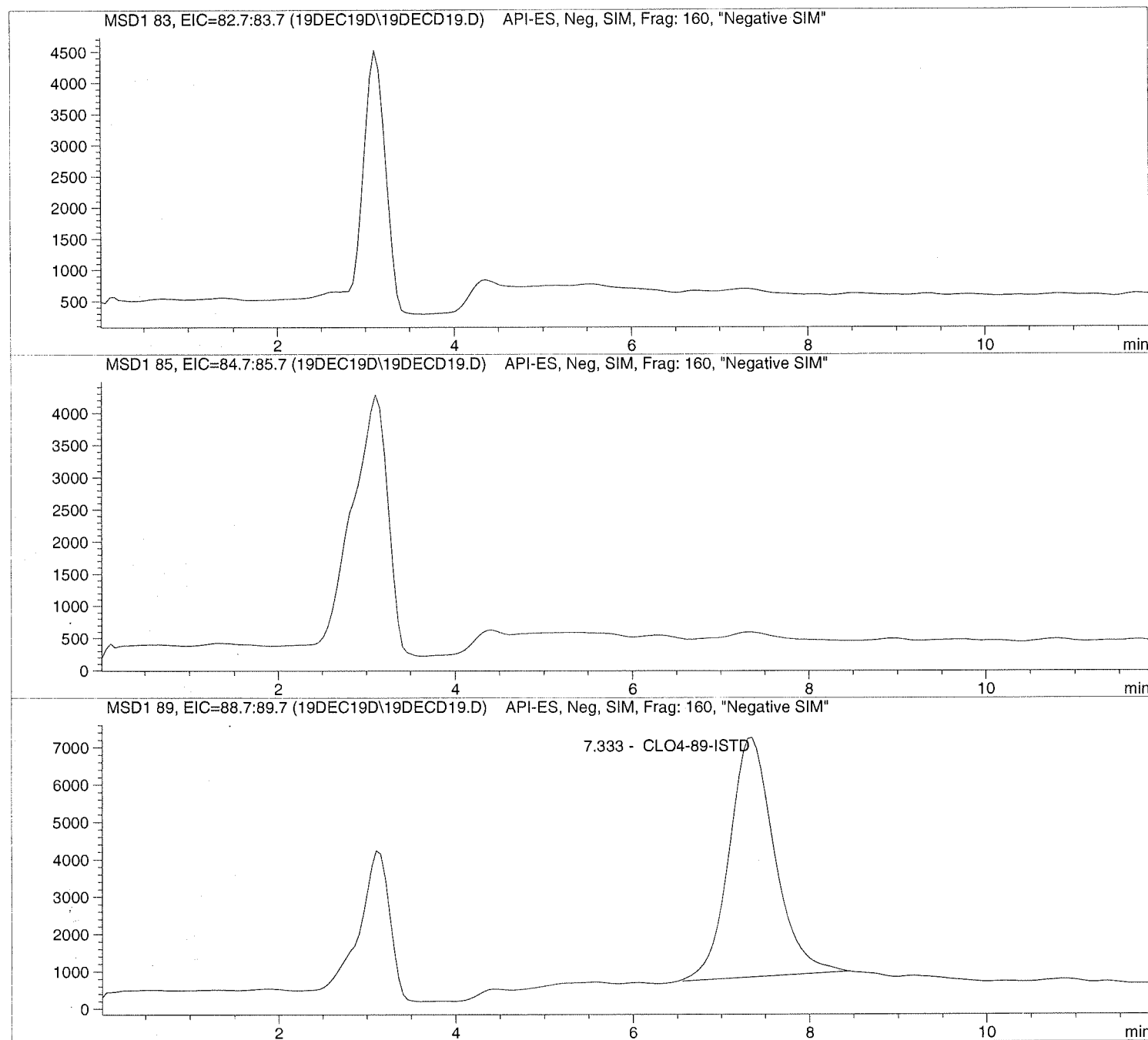
Sample Name: 1934611004

Injection Date: 12/19/2019 13:00:48
Sample Name: 1934611004
Acq Operator: TNB

Seq Line: 19
Location: Vial 88
Inj. No.: 1
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19DEC19D\19DECD19.D Sample Name: 1934611004

```
=====
Injection Date: 12/19/2019 13:00:48      Seq Line: 19
Sample Name: 1934611004                  Location: Vial 88
Acq Operator: TNB                        Inj. No.: 1
                                           Inj. Vol.: 35 µl
=====
```

```
Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45
=====
```

Perchlorate analysis

Sample Information

```
Sorted By: Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 0.000
=====
```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.333	PBA	229273.0	5.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19DEC19D\19DECD20.D

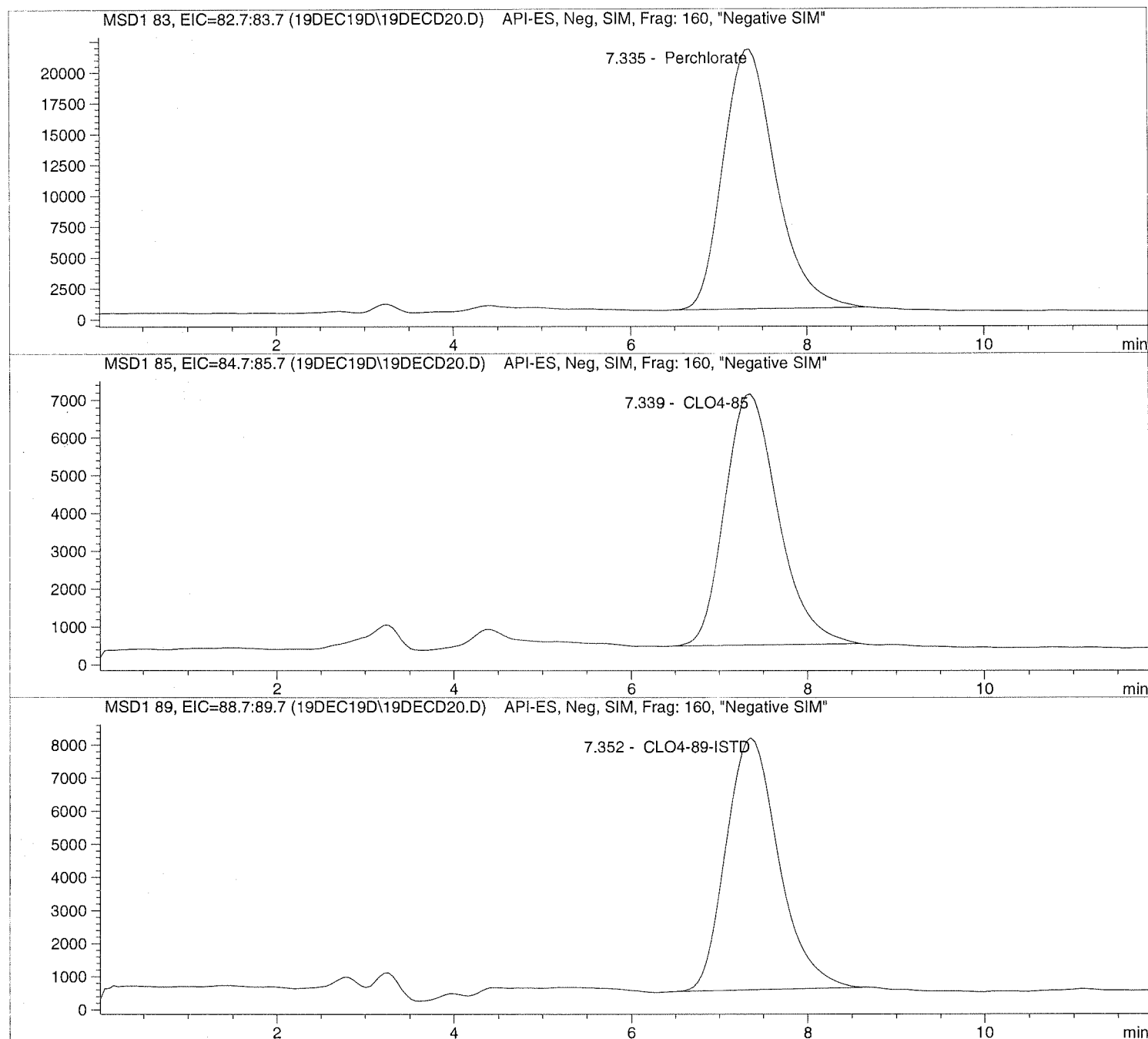
Sample Name: 1934611005

Injection Date: 12/19/2019 13:14:44
Sample Name: 1934611005
Acq Operator: TNB

Seq Line: 20
Location: Vial 89
Inj. No.: 1
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19DEC19D\19DECD20.D Sample Name: 1934611005

```

=====
Injection Date: 12/19/2019 13:14:44      Seq Line:          20
Sample Name:   1934611005                Location:          Vial 89
Acq Operator:  TNB                       Inj. No.:         1
                                           Inj. Vol.:       35 µl
=====

```

```

Acq. Method:   CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:  11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:          Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:        1.000000
Dilution:          1.000000
Sample Amount:     0.000
=====

```

```

=====
                          LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.335	PBA	868102.6	9.9723	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.339	PBA	278308.8	10.3779	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.352	PBA	316177.7	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

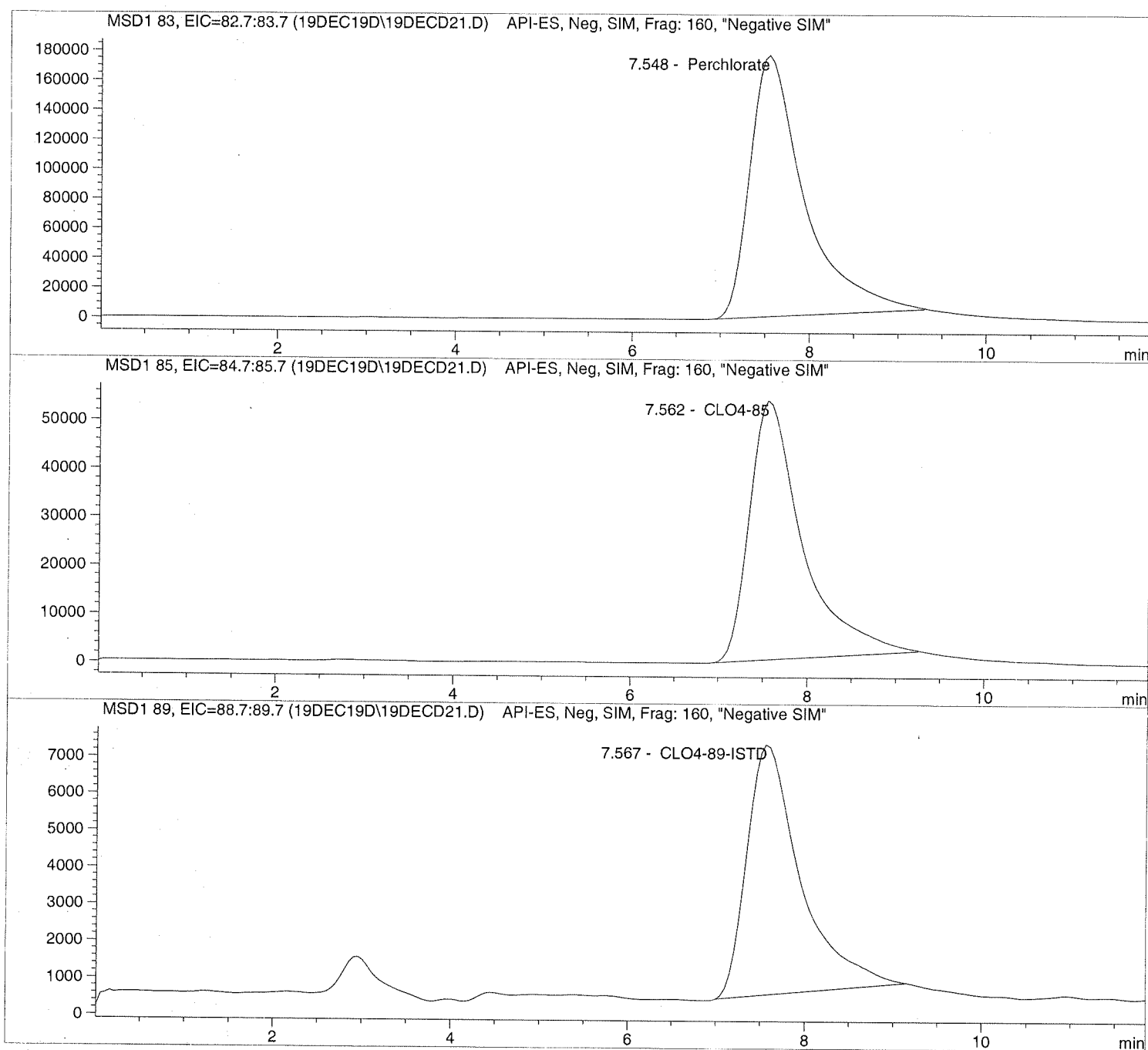
```

Data file: C:\HPCHEM\1\DATA\19DEC19D\19DECD21.D Sample Name: 1934611006 1K

=====
Injection Date: 12/19/2019 13:28:39 Seq Line: 21
Sample Name: 1934611006 1K Location: Vial 90
Acq Operator: TNB Inj. No.: 1
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis
=====



Data file: C:\HPCHEM\1\DATA\19DEC19D\19DECD21.D Sample Name: 1934611006 1K

```
=====
Injection Date: 12/19/2019 13:28:39      Seq Line:          21
Sample Name:    1934611006 1K           Location:          Vial 90
Acq Operator:   TNB                     Inj. No.:         1
                                           Inj. Vol.:        35 µl
=====
```

```
Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   11/5/2019 08:44:45
```

Perchlorate analysis

Sample Information

```
Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019, 00:20:59 pm
Multiplier:     1.000000
Dilution:       1000.000000
Sample Amount:  0.000
```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.548	PBA	7487619.0	74495.3427	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.562	PBA	2221116.0	73629.1625	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.567	PBA	284295.8	5000.0000	CLO4-89-ISTD

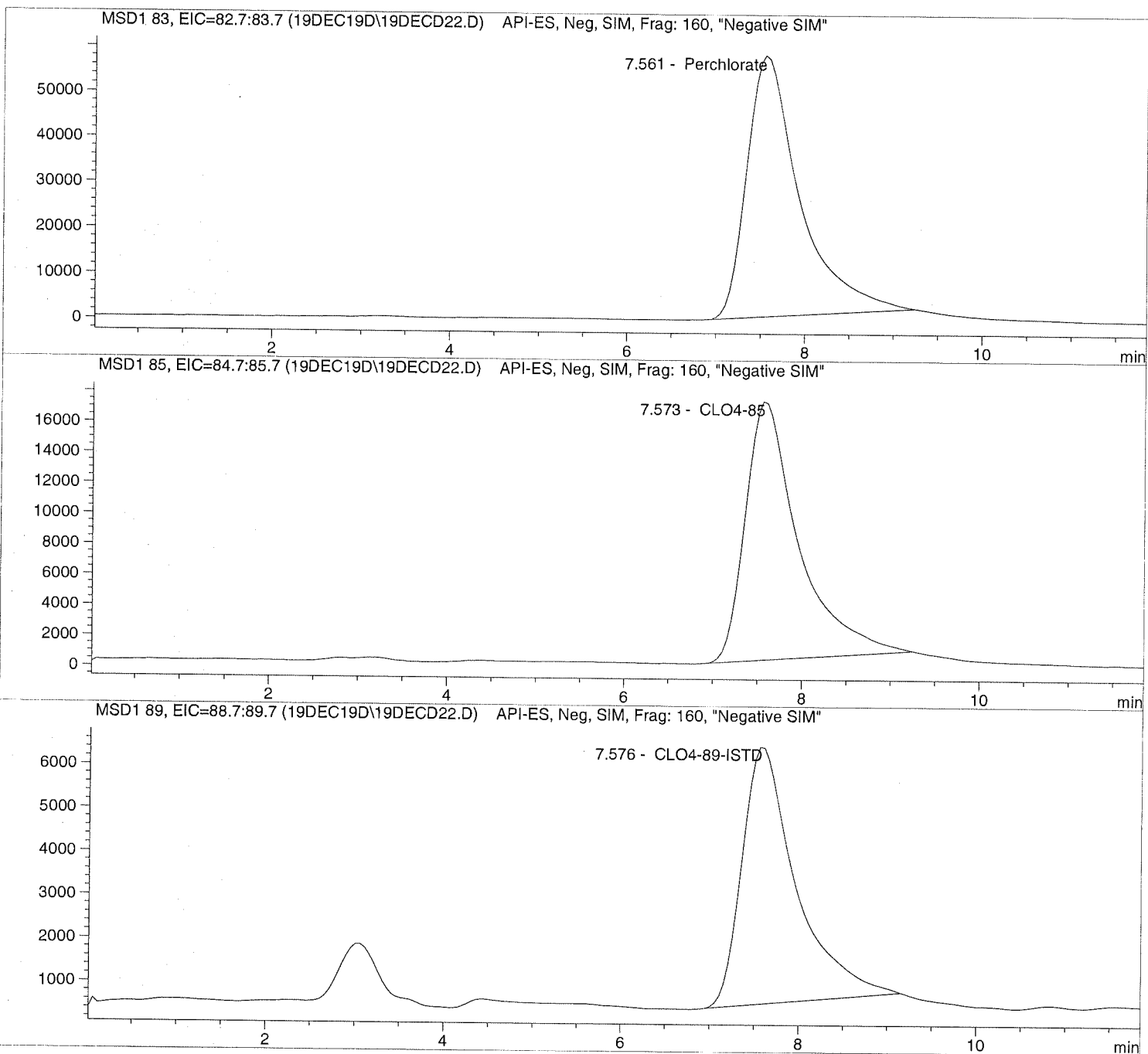
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19DEC19D\19DECD22.D Sample Name: 1934606006 10X

Injection Date: 12/19/2019 13:42:34 Seq Line: 22
Sample Name: 1934606006 10X Location: Vial 91
Acq Operator: TNB Inj. No.: 1
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19DEC19D\19DECD22.D Sample Name: 1934606006 10X

```

=====
Injection Date: 12/19/2019 13:42:34      Seq Line:      22
Sample Name:   1934606006 10X           Location:      Vial 91
Acq Operator:  TNB                      Inj. No.:     1
                                           Inj. Vol.:    35 µl
  
```

```

Acq. Method:   CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:  11/5/2019 08:44:45
  
```

Perchlorate analysis

Sample Information

```

=====
Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:    1.000000
Dilution:      10.000000
Sample Amount: 0.000
  
```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.561	PBA	2375332.8	316.8617	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.573	PBA	703769.4	309.4659	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.576	PBA	249233.1	50.0000	CLO4-89-ISTD

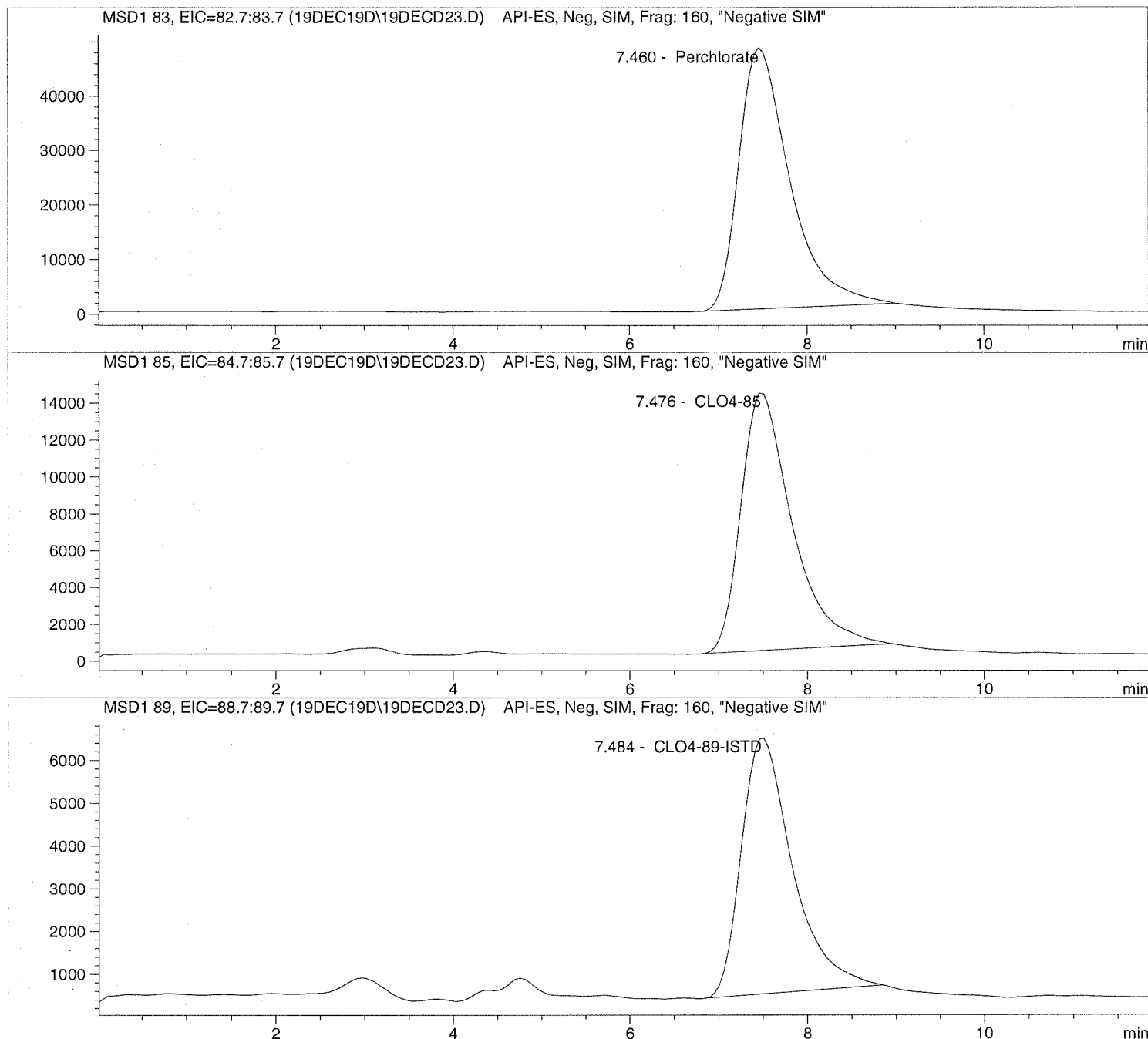
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19DEC19D\19DECD23.D Sample Name: 689019 CCV@25

=====
Injection Date: 12/19/2019 13:56:24 Seq Line: 23
Sample Name: 689019 CCV@25 Location: Vial 71
Acq Operator: TNB Inj. No.: 1
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis
=====



Data file: C:\HPCHEM\1\DATA\19DEC19D\19DECD23.D Sample Name: 689019 CCV@25

=====
Injection Date: 12/19/2019 13:56:24 Seq Line: 23
Sample Name: 689019 CCV@25 Location: Vial 71
Acq Operator: TNB Inj. No.: 1
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis

=====
Sample Information
=====

Sorted By: Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 25.000

=====
LCMS Results
=====

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.460	PBA	1916956.3	27.0329	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.476	PBA	562099.7	26.1054	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.484	PBA	240281.0	5.0000	CLO4-89-ISTD

=====
*** End of Report ***
=====



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Initial Calibration


```

=====
                          Calibration Table
=====

```

Perchlorate

```

Calib. Data Modified   :      9/23/2019 12:20:59 PM

Calculate              :      Internal Standard
Based on               :      Peak Area

Rel. Reference Window :      20.000 %
Abs. Reference Window :      0.000 min
Rel. Non-ref. Window  :      20.000 %
Abs. Non-ref. Window  :      0.000 min
Use Multiplier & Dilution Factor with ISTDs
Uncalibrated Peaks    :      not reported
Partial Calibration    :      No recalibration if peaks missing

Curve Type             :      Quadratic (some peaks differ, see below)
Origin                 :      Ignored (some peaks differ, see below)
Weight                 :      Linear (Amnt) (some peaks differ, see below)

Recalibration Settings:
Average Response       :      Average all calibrations
Average Retention Time:      Floating Average New 75%

```

Calibration Report Options :

Printout of recalibrations within a sequence:

Calibration Table after Recalibration

Normal Report after Recalibration

If the sequence is done with bracketing:

Results of first cycle (ending previous bracket)

Default Sample ISTD Information (if not set in sample table):

ISTD ISTD Amount Name

#

```

-----|-----|-----
1      5.00000  CLO4-89-ISTD

```

Signal 1: MSD1 83, EIC=82.7:83.7

Signal 2: MSD1 85, EIC=84.7:85.7

Signal 3: MSD1 89, EIC=88.7:89.7

RetTime [min]	Lvl Sig	Amount	Area	Amt/Area	Ref Grp	Name
7.750	1 3	1.00000	5.39218e4	1.85454e-5	1	Perchlorate
	4	2.00000	1.32825e5	1.50574e-5		
	5	5.00000	2.76271e5	1.80982e-5		
	6	10.00000	5.61298e5	1.78159e-5		
	7	25.00000	1.51820e6	1.64669e-5		
	8	50.00000	3.31156e6	1.50986e-5		
	9	75.00000	5.23914e6	1.43153e-5		
7.767	3 3	5.00000	2.14568e5	2.33026e-5	+I1	CLO4-89-ISTD
	4	5.00000	2.04758e5	2.44190e-5		
	5	5.00000	2.13407e5	2.34294e-5		
	6	5.00000	2.09246e5	2.38953e-5		
	7	5.00000	2.07403e5	2.41077e-5		
	8	5.00000	2.02929e5	2.46391e-5		
	9	5.00000	1.97933e5	2.52611e-5		
7.778	2 3	1.00000	1.70436e4	5.86732e-5	1	CLO4-85
	4	2.00000	4.20754e4	4.75337e-5		
	5	5.00000	9.24707e4	5.40712e-5		
	6	10.00000	1.68622e5	5.93041e-5		
	7	25.00000	4.63724e5	5.39114e-5		
	8	50.00000	9.95933e5	5.02042e-5		

Method C:\HPCHEM\1\METHODS\CLO4-DP3.M

RetTime [min]	Lvl Sig	Amount	Area	Amt/Area	Ref	Grp Name
9		75.00000	1.58066e6	4.74484e-5		

More compound-specific settings:

Compound: Perchlorate

Time Window : From 3.581 min To 11.899 min
 Curve Type : Quadratic
 Origin : Ignored
 Calibration Level Weights:/
 Level 3 : 1
 Level 4 : 0.5
 Level 5 : 0.2
 Level 6 : 0.1
 Level 7 : 0.04
 Level 8 : 0.02
 Level 9 : 0.013333

Compound: CLO4-89-ISTD

Time Window : From 3.581 min To 11.896 min
 Curve Type : Linear
 Origin : Included
 Calibration Level Weights:/
 Level 3 : 1
 Level 4 : 1
 Level 5 : 1
 Level 6 : 1
 Level 7 : 1
 Level 8 : 1
 Level 9 : 1

Compound: CLO4-85

Time Window : From 3.601 min To 11.913 min
 Curve Type : Quadratic
 Origin : Ignored
 Calibration Level Weights:/
 Level 3 : 1
 Level 4 : 0.5
 Level 5 : 0.2
 Level 6 : 0.1
 Level 7 : 0.04
 Level 8 : 0.02
 Level 9 : 0.013333

```

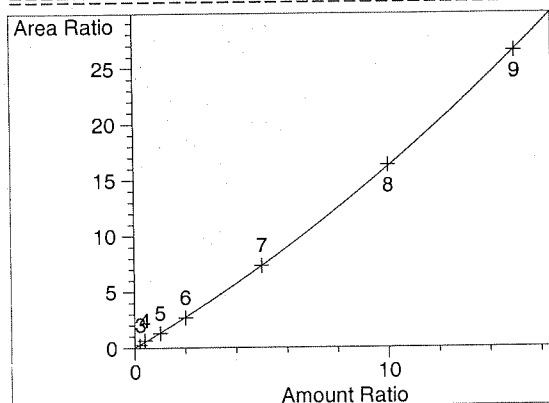
=====
                          Peak Sum Table
=====

```

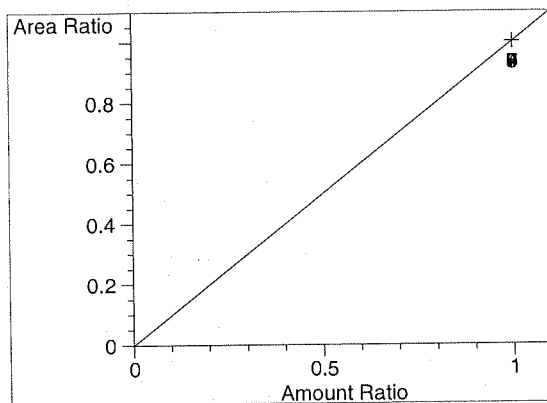
```

***No Entries in table***
=====

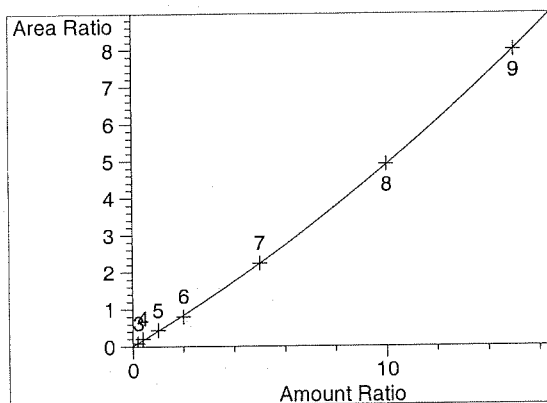
```

=====
 Calibration Curves
 =====


Perchlorate at exp. RT: 7.750
 MSD1 83, EIC=82.7:83.7
 Correlation: 0.99975
 Residual Std. Dev.: 0.10284
 Formula: $y = ax^2 + bx + c$
 a: 3.10463e-2
 b: 1.30369
 c: 2.19496e-2
 x: Amount Ratio
 y: Area Ratio
 Calibration Level Weights:
 Level 3 : 1
 Level 4 : 0.5
 Level 5 : 0.2
 Level 6 : 0.1
 Level 7 : 0.04
 Level 8 : 0.02
 Level 9 : 0.013333



CLO4-89-ISTD at exp. RT: 7.767
 MSD1 89, EIC=88.7:89.7
 Correlation: 1.00000
 Residual Std. Dev.: 0.00000
 Formula: $y = mx + b$
 m: 1.00000
 b: 0.00000
 x: Amount Ratio
 y: Area Ratio
 Calibration Level Weights:
 Level 3 : 1
 Level 4 : 1
 Level 5 : 1
 Level 6 : 1
 Level 7 : 1
 Level 8 : 1
 Level 9 : 1



CLO4-85 at exp. RT: 7.778
 MSD1 85, EIC=84.7:85.7
 Correlation: 0.99969
 Residual Std. Dev.: 0.02601
 Formula: $y = ax^2 + bx + c$
 a: 8.85207e-3
 b: 3.99283e-1
 c: 1.33505e-2
 x: Amount Ratio
 y: Area Ratio
 Calibration Level Weights:
 Level 3 : 1
 Level 4 : 0.5
 Level 5 : 0.2
 Level 6 : 0.1
 Level 7 : 0.04
 Level 8 : 0.02
 Level 9 : 0.013333

Batch Report: C:\HPCHEM\1\DATA\20SEP19I\20SEP19D.B

Batch Review Method:

C:\HPCHEM\1\METHODS\CLO4-DP3.M

['#' ==> Run has not been reprocessed with Batch Review Method

['*' ==> Run has been saved with batch file]

#*	Sample	Location	Inj	SampleType	Run	Perchlorate Area	Perchlorat RT	Perchlorate Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	5.39218e4	7.750	8.75982e-1
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	1.32825e5	7.797	2.37682
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	2.76271e5	7.770	4.77237
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	5.61298e5	7.785	9.75097
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	1.51820e6	7.741	25.01082
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	3.31156e6	7.775	50.40300
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	5.23914e6	7.736	74.79107
#*	ICAL Verf@10ug/L	Vial 80	1	Control	11	5.74879e5	7.756	10.11855

#*	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	2.14568e5	7.767	5.00000
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	2.04758e5	7.816	5.00000
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	2.13407e5	7.793	5.00000
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	2.09246e5	7.798	5.00000
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	2.07403e5	7.763	5.00000
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	2.02929e5	7.800	5.00000
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	1.97933e5	7.765	5.00000
#*	ICAL Verf@10ug/L	Vial 80	1	Control	11	2.06243e5	7.776	5.00000

#*	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	1.70436e4	7.778	8.24488e-1
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	4.20754e4	7.805	2.38090
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	9.24707e4	7.787	5.14166
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	1.68622e5	7.781	9.52209
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	4.63724e5	7.760	25.04916
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	9.95933e5	7.793	50.14223
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	1.58066e6	7.758	74.93659
#*	ICAL Verf@10ug/L	Vial 80	1	Control	11	1.71000e5	7.760	9.79043

*** End of Report ***

Sequence Table:

Method and Injection Info Part:

Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
====	=====	=====	=====	===	=====	=====	=====
1	Vial 71	CLO4@ 0.2ug/L	CLO4-AQN	1	Ctrl Samp		
2	Vial 72	CLO4@ 0.5ug/L	CLO4-AQN	1	Ctrl Samp		
3	Vial 73	CLO4@ 1.0ug/L	CLO4-AQN	1	Ctrl Samp		
4	Vial 74	CLO4@ 2.0ug/L	CLO4-AQN	1	Ctrl Samp		
5	Vial 75	CLO4@ 5.0ug/L	CLO4-AQN	1	Ctrl Samp		
6	Vial 76	CLO4@ 10.ug/L	CLO4-AQN	1	Ctrl Samp		
7	Vial 77	CLO4@ 25.ug/L	CLO4-AQN	1	Ctrl Samp		
8	Vial 78	CLO4@ 50.ug/L	CLO4-AQN	1	Ctrl Samp		
9	Vial 79	CLO4@ 75.ug/L	CLO4-AQN	1	Ctrl Samp		
10	Vial 71	CLO4@ 0.2ug/L	CLO4-AQN	1	Ctrl Samp		
11	Vial 80	ICAL Verf@10ug/L	CLO4-AQN	1	Ctrl Samp		

Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI03.D

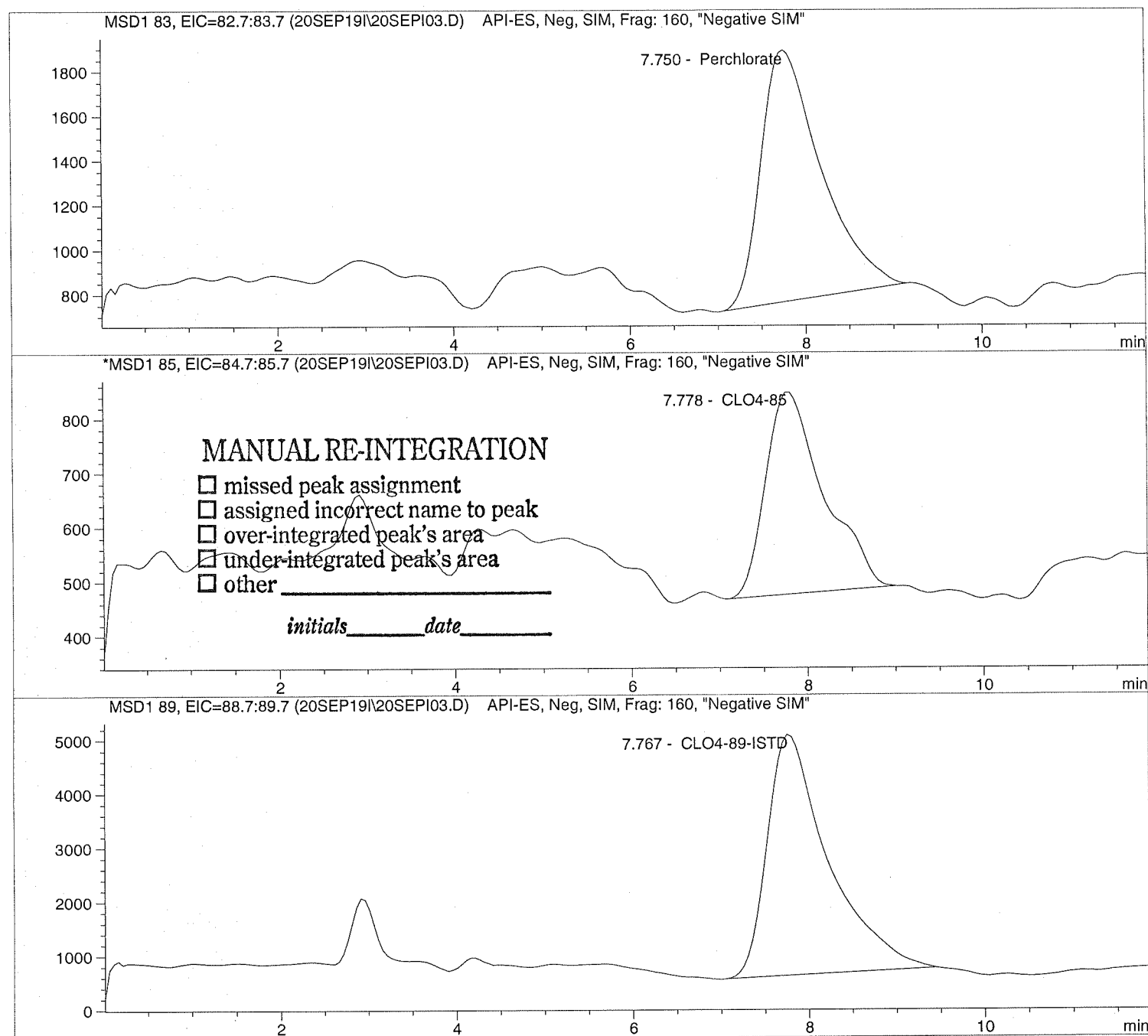
Sample Name: CLO4@ 1.0ug/L

Injection Date: 9/20/2019 09:24:05
Sample Name: CLO4@ 1.0ug/L
Acq Operator: TNB

Seq Line: 3
Location: Vial 73
Inj. No.: 1
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:21:47

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI03.D

Sample Name: CLO4@ 1.0ug/L

```

=====
Injection Date:  9/20/2019  09:24:05      Seq Line:      3
Sample Name:    CLO4@ 1.0ug/L      Location:      Vial 73
Acq Operator:   TNB                Inj. No.:     1
                                           Inj. Vol.:    30 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   9/23/2019  12:21:47
=====

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:    1.000000
Dilution:      1.000000
Sample Amount: 1.000
=====

```

```

=====
                          LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.750	PBA	53921.8	0.8760	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.778	MM	17043.6	0.8245	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.767	PBA	214568.1	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

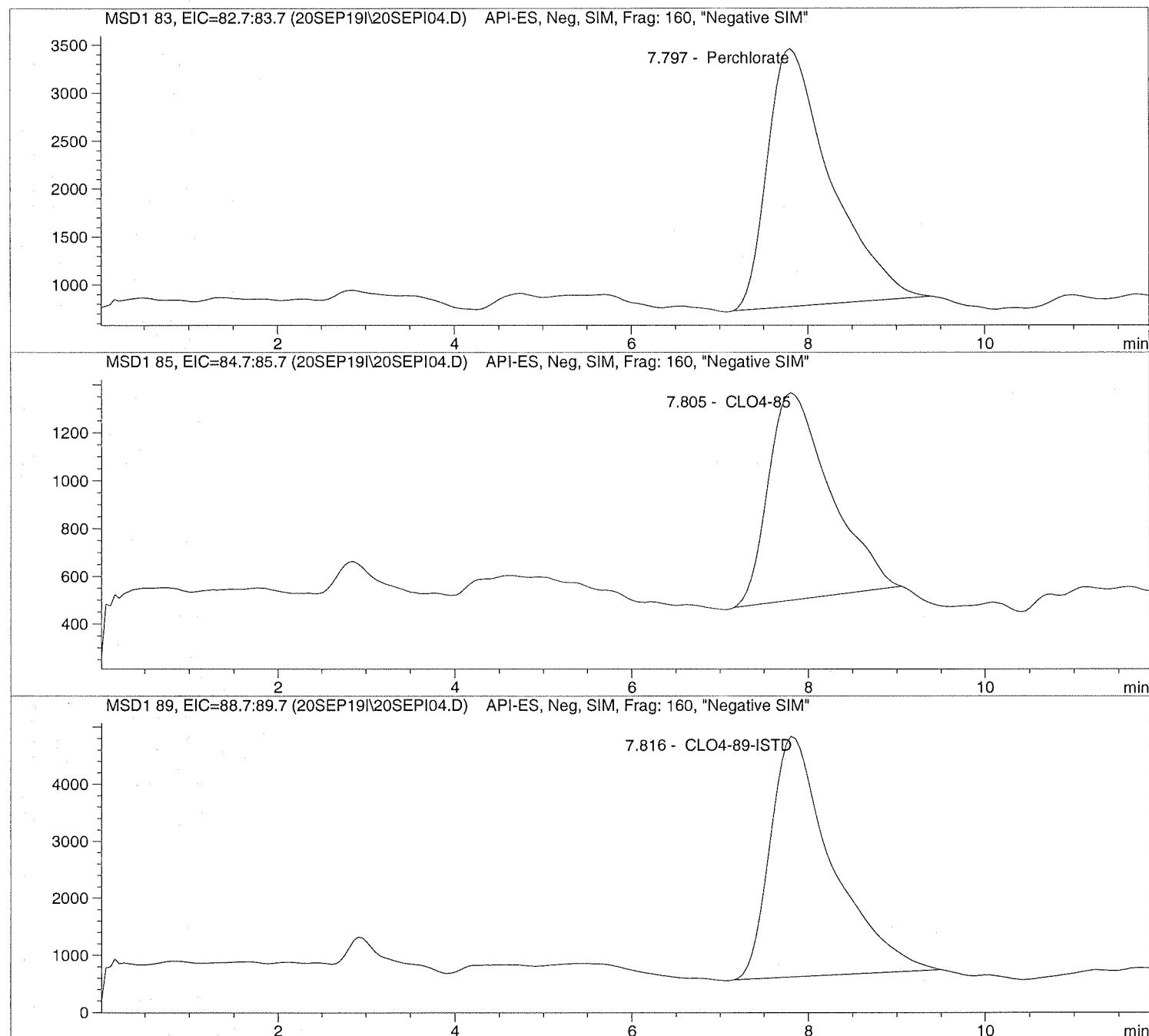
```

Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI04.D Sample Name: CLO4@ 2.0ug/L

=====
Injection Date: 9/20/2019 09:37:58 Seq Line: 4
Sample Name: CLO4@ 2.0ug/L Location: Vial 74
Acq Operator: TNB Inj. No.: 1
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:21:47

Perchlorate analysis
=====



Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI04.D Sample Name: CLO4@ 2.0ug/L

```

=====
Injection Date: 9/20/2019 09:37:58      Seq Line: 4
Sample Name:    CLO4@ 2.0ug/L          Location:  Vial 74
Acq Operator:   TNB                    Inj. No.: 1
                                           Inj. Vol.: 30 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   9/23/2019 12:21:47
=====

```

Perchlorate analysis

Sample Information

```

=====
Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:    1.000000
Dilution:      1.000000
Sample Amount: 2.000
=====

```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.797	PBA	132825.2	2.3768	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.805	PBA	42075.4	2.3809	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.816	PBA	204758.3	5.0000	CLO4-89-ISTD

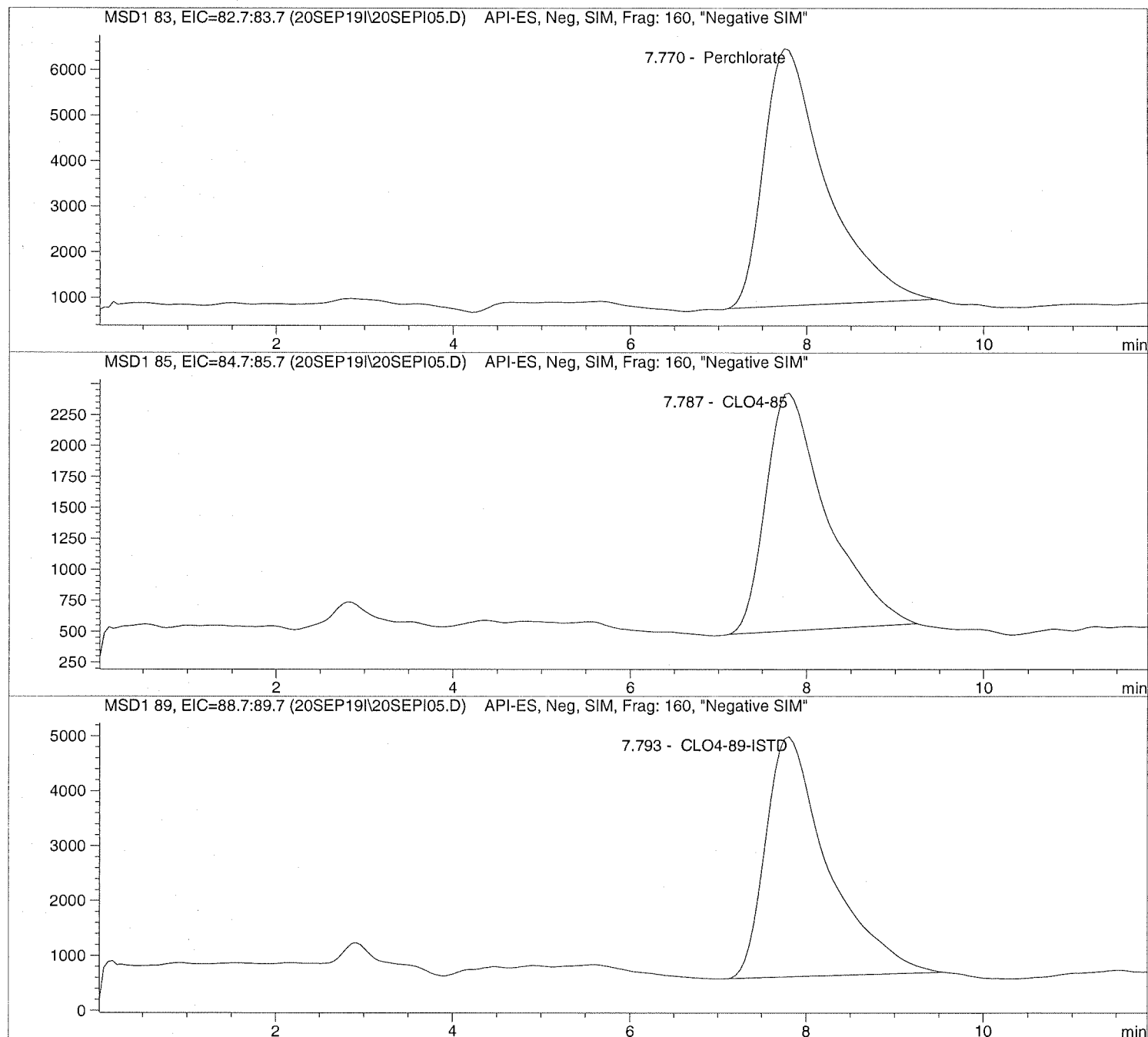
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI05.D Sample Name: CLO4@ 5.0ug/L

=====
Injection Date: 9/20/2019 09:51:49 Seq Line: 5
Sample Name: CLO4@ 5.0ug/L Location: Vial 75
Acq Operator: TNB Inj. No.: 1
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:21:47

Perchlorate analysis
=====



Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI05.D

Sample Name: CLO4@ 5.0ug/L

```

=====
Injection Date: 9/20/2019 09:51:49      Seq Line: 5
Sample Name:    CLO4@ 5.0ug/L           Location:  Vial 75
Acq Operator:   TNB                     Inj. No.: 1
                                           Inj. Vol.: 30 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   9/23/2019 12:21:47
=====

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  5.000
=====

```

```

=====
                          LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.770	PBA	276270.7	4.7724	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.787	PBA	92470.7	5.1417	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.793	PBA	213407.0	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

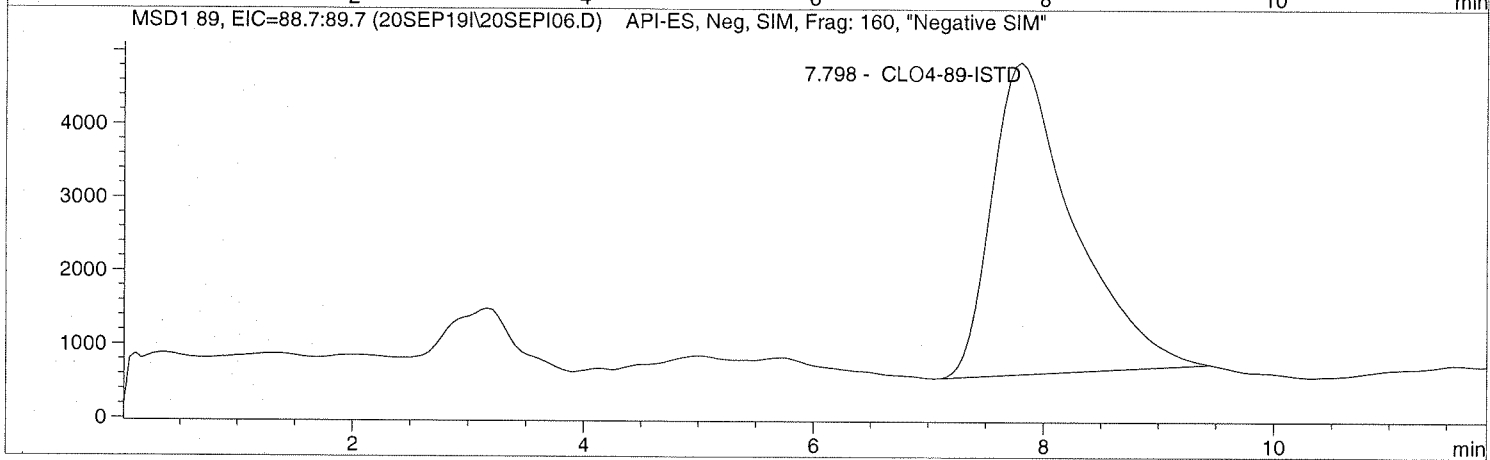
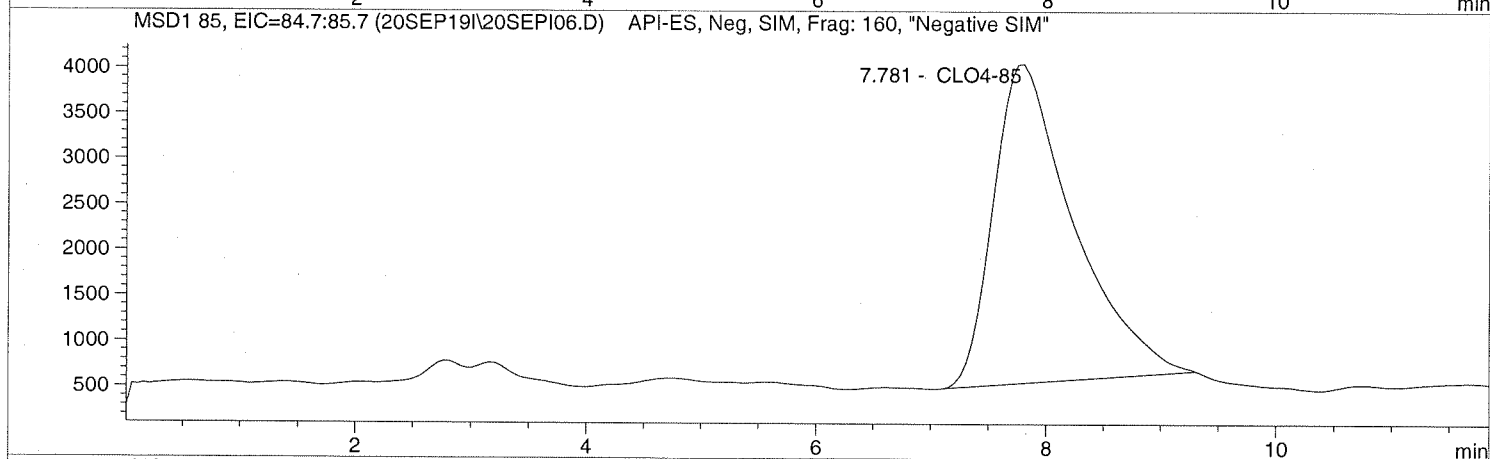
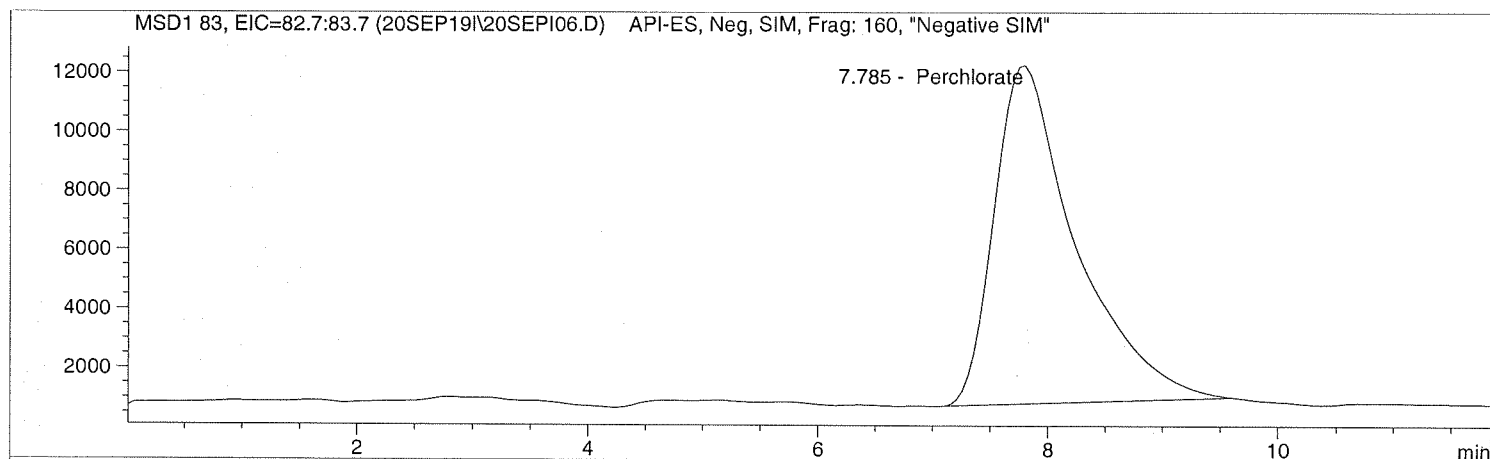
```

Data file: C:\HPCHEM\1\DATA\20SEP19\20SEPI06.D Sample Name: CLO4@ 10.ug/L

=====
Injection Date: 9/20/2019 10:05:36 Seq Line: 6
Sample Name: CLO4@ 10.ug/L Location: Vial 76
Acq Operator: TNB Inj. No.: 1
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:21:47

Perchlorate analysis
=====



Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI06.D

Sample Name: CLO4@ 10.ug/L

```

=====
Injection Date: 9/20/2019 10:05:36      Seq Line: 6
Sample Name:    CLO4@ 10.ug/L           Location:  Vial 76
Acq Operator:  TNB                      Inj. No.: 1
                                           Inj. Vol.: 30 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   9/23/2019 12:21:47
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  10.000
=====

```

```

=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.785	PBA	561297.7	9.7510	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.781	PBA	168622.4	9.5221	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.798	PBA	209246.3	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI07.D

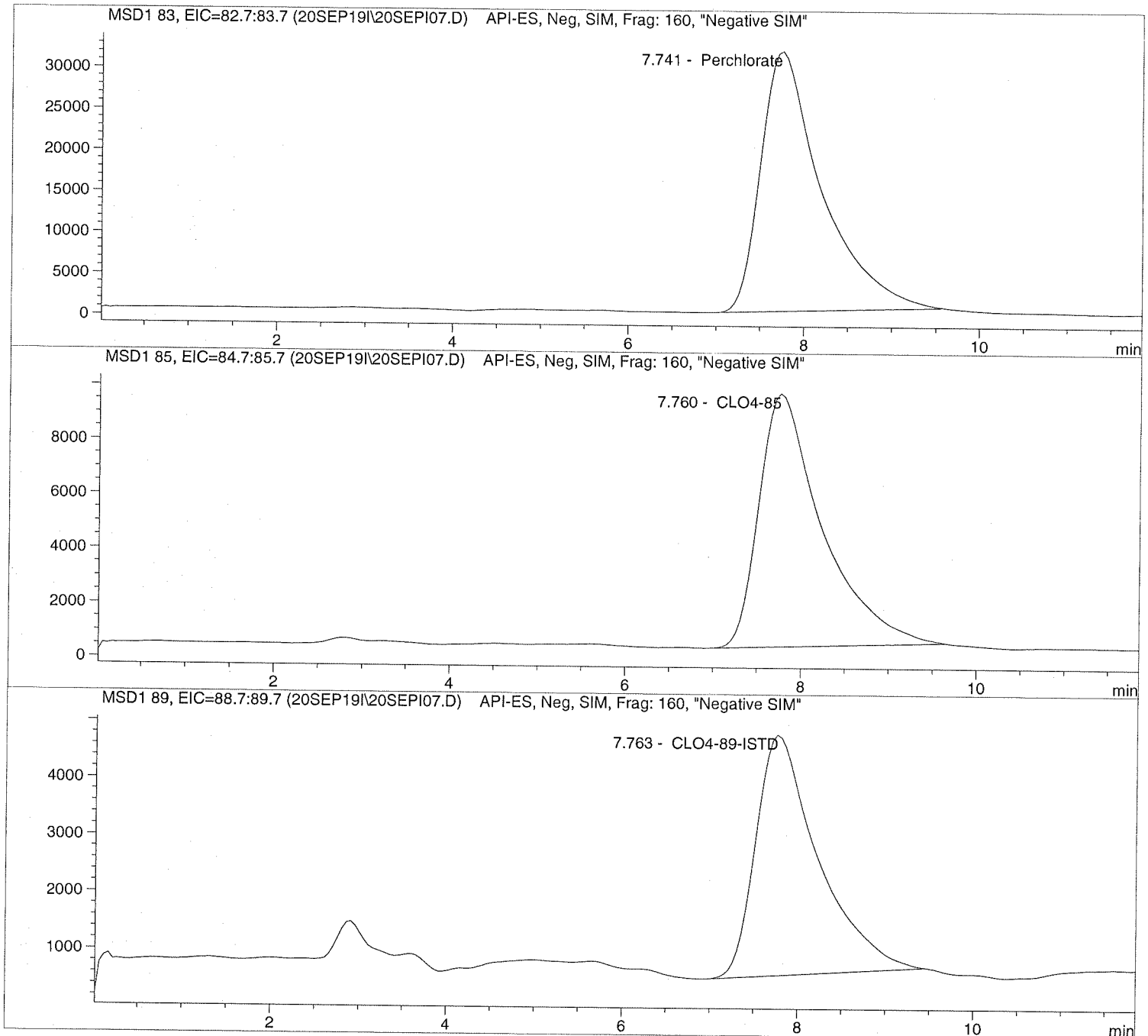
Sample Name: CLO4@ 25.ug/L

=====
Injection Date: 9/20/2019 10:19:23
Sample Name: CLO4@ 25.ug/L
Acq Operator: TNB

Seq Line: 7
Location: Vial 77
Inj. No.: 1
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:21:47

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI07.D

Sample Name: CLO4@ 25.ug/L

```

=====
Injection Date: 9/20/2019 10:19:23      Seq Line: 7
Sample Name: CLO4@ 25.ug/L              Location: Vial 77
Acq Operator: TNB                       Inj. No.: 1
                                           Inj. Vol.: 30 µl
=====

```

```

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:21:47
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By: Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 25.000
=====

```

```

=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.741	PBA	1518197.9	25.0108	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.760	PBA	463724.0	25.0492	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.763	PBA	207402.8	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI08.D

Sample Name: CLO4@ 50.ug/L

Injection Date: 9/20/2019 10:33:18

Seq Line: 8

Sample Name: CLO4@ 50.ug/L

Location: Vial 78

Acq Operator: TNB

Inj. No.: 1

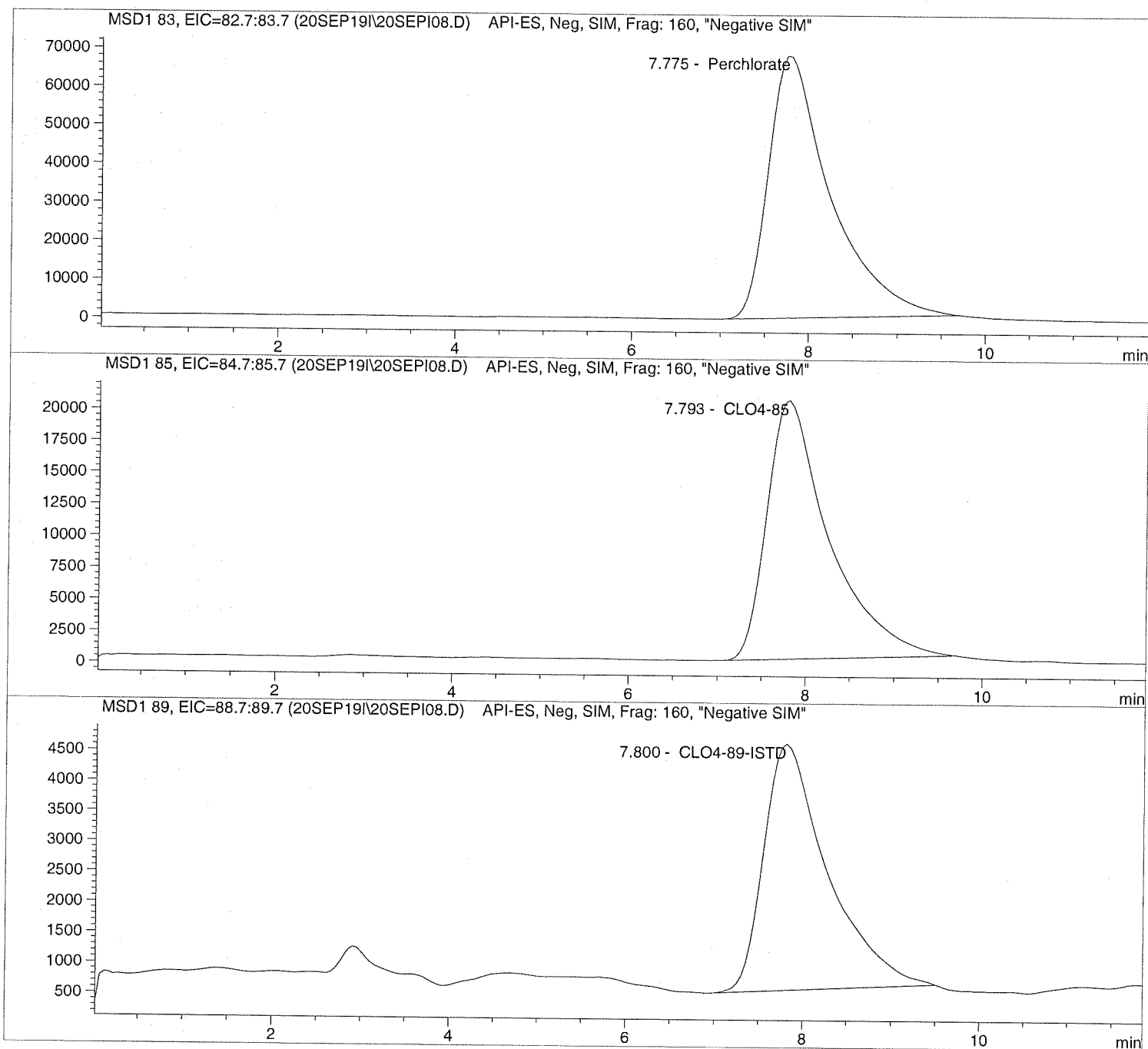
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M

Last Changed: 9/23/2019 12:21:47

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI08.D Sample Name: CLO4@ 50.ug/L

```

=====
Injection Date: 9/20/2019 10:33:18      Seq Line:      8
Sample Name:   CLO4@ 50.ug/L           Location:      Vial 78
Acq Operator:  TNB                     Inj. No.:     1
                                           Inj. Vol.:    30 µl
  
```

```

Acq. Method:   CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:  9/23/2019 12:21:47
  
```

Perchlorate analysis

Sample Information

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:    1.000000
Dilution:      1.000000
Sample Amount: 50.000
  
```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.775	PBA	3311559.2	50.4030	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.793	PBA	995933.0	50.1422	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.800	PBA	202929.2	5.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI09.D

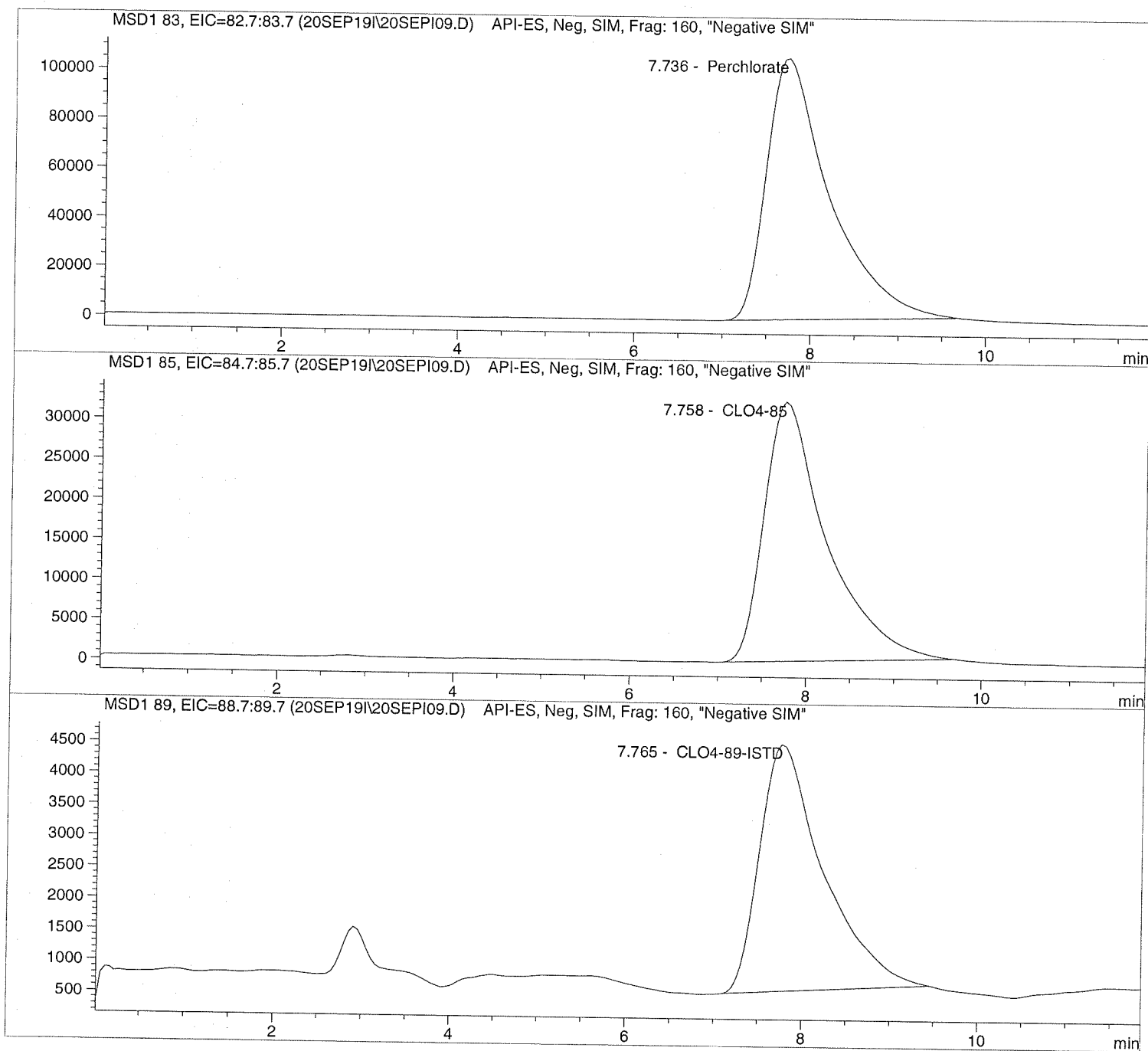
Sample Name: CLO4@ 75.ug/L

Injection Date: 9/20/2019 10:47:05
Sample Name: CLO4@ 75.ug/L
Acq Operator: TNB

Seq Line: 9
Location: Vial 79
Inj. No.: 1
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:21:47

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI09.D

Sample Name: CLO4@ 75.ug/L

```

=====
Injection Date: 9/20/2019 10:47:05      Seq Line:          9
Sample Name:    CLO4@ 75.ug/L           Location:          Vial 79
Acq Operator:   TNB                     Inj. No.:         1
                                           Inj. Vol.:       30 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   9/23/2019 12:21:47
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:    1.000000
Dilution:      1.000000
Sample Amount: 75.000
=====

```

```

=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.736	PBA	5239145.0	74.7911	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.758	PBA	1580664.2	74.9366	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.765	PBA	197932.5	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI11.D

Sample Name: ICAL Verf@10ug/L

Injection Date: 9/20/2019 11:14:45

Seq Line: 11

Sample Name: ICAL Verf@10ug/L

Location: Vial 80

Acq Operator: TNB

Inj. No.: 1

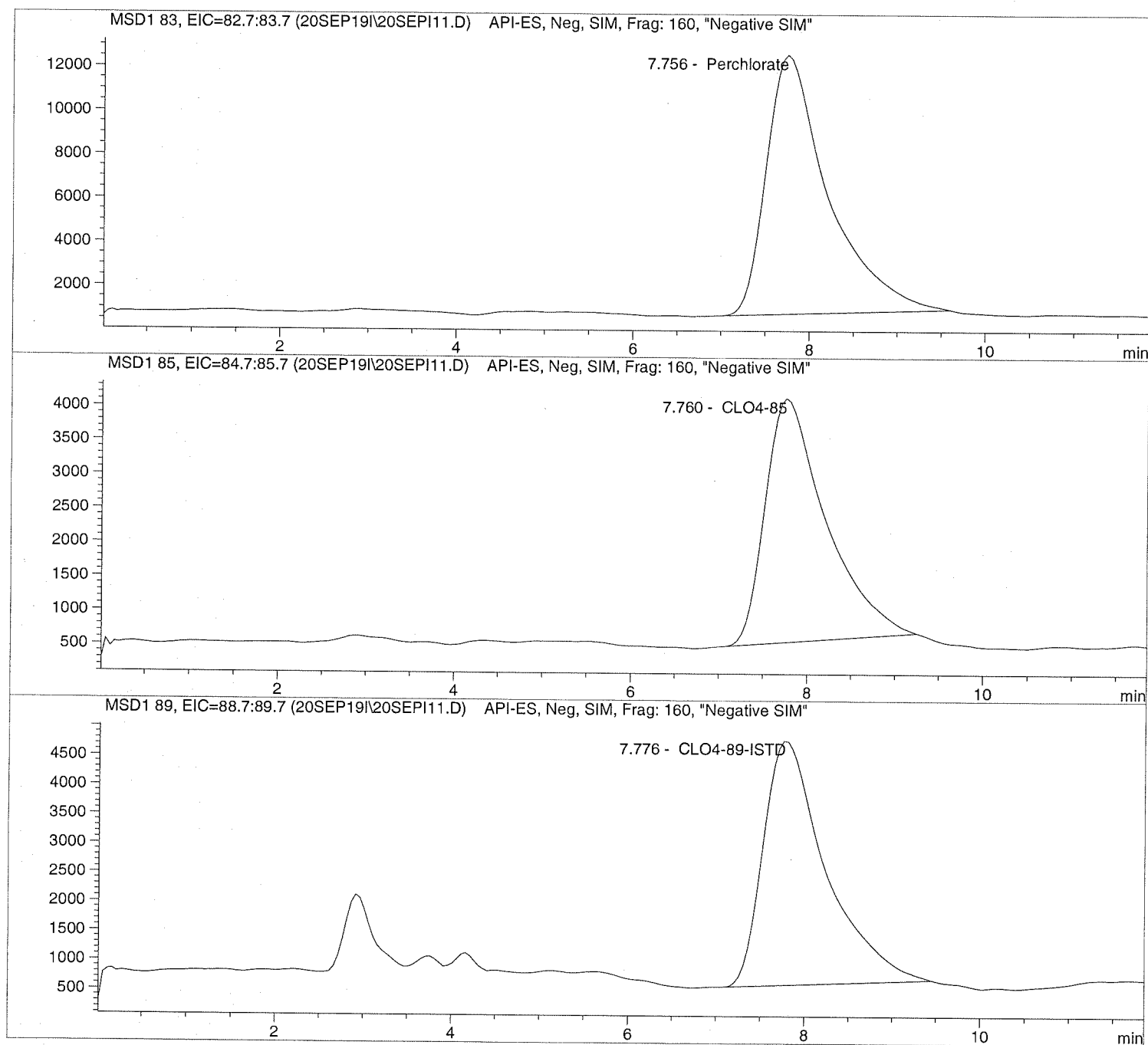
Inj. Vol.: 30 μ l

Acq. Method: CLO4-AQN.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M

Last Changed: 9/23/2019 12:21:47

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI11.D Sample Name: ICAL Verf@10ug/L

```

=====
Injection Date:  9/20/2019  11:14:45          Seq Line:           11
Sample Name:    ICAL Verf@10ug/L             Location:           Vial 80
Acq Operator:   TNB                          Inj. No.:          1
                                           Inj. Vol.:         30 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   9/23/2019  12:21:47
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  10.000
=====

```

```

=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.756	PBA	574879.4	10.1185	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.760	PBA	171000.4	9.7904	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.776	PBA	206243.3	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

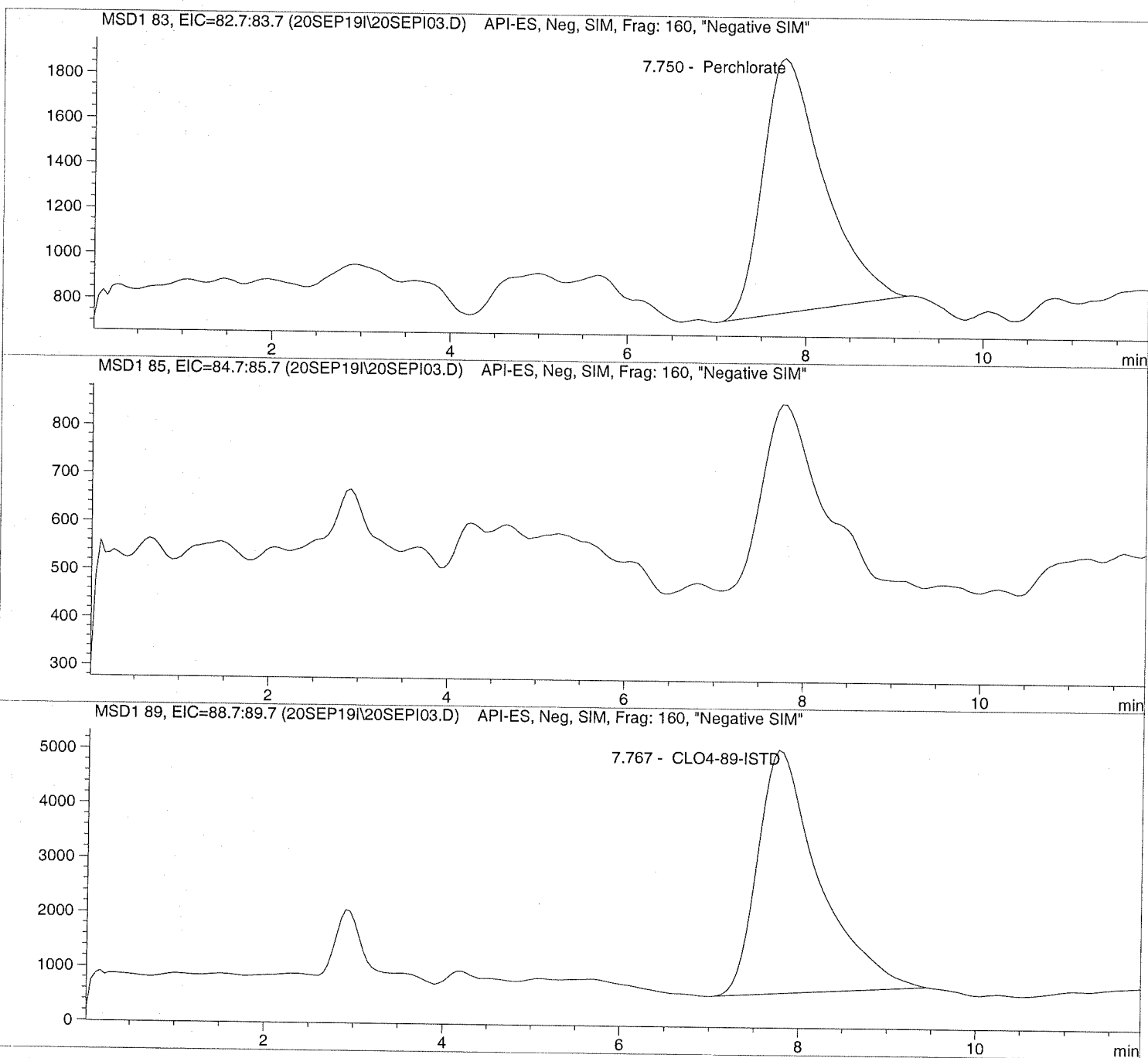
Unmodified

Data file: C:\HPCHEM\1\DATA\20SEP19\20SEPI03.D Sample Name: CLO4@ 1.0ug/L

=====
Injection Date: 9/20/2019 09:24:05 Seq Line: 3
Sample Name: CLO4@ 1.0ug/L Location: Vial 73
Acq Operator: TNB Inj. No.: 1
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:27:11

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI03.D

Sample Name: CLO4@ 1.0ug/L

```

=====
Injection Date: 9/20/2019 09:24:05      Seq Line: 3
Sample Name:   CLO4@ 1.0ug/L           Location:  Vial 73
Acq Operator:  TNB                     Inj. No.: 1
                                           Inj. Vol.: 30 µl
=====

```

```

Acq. Method:   CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:  9/23/2019 12:27:11
=====

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:          Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:         1.000000
Dilution:           1.000000
Sample Amount:      1.000
=====

```

```

=====
                          LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.750	PBA	53921.8	0.8760	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.767	PBA	214568.1	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```


Data file: C:\HPCHEM\1\DATA\19DEC19D\19DECD17.D

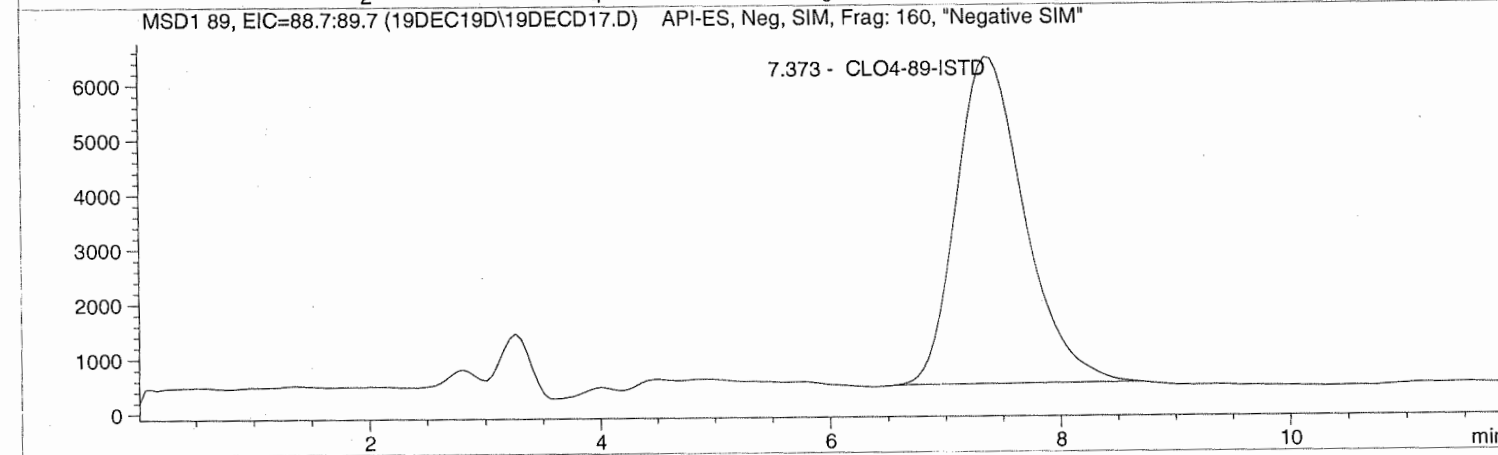
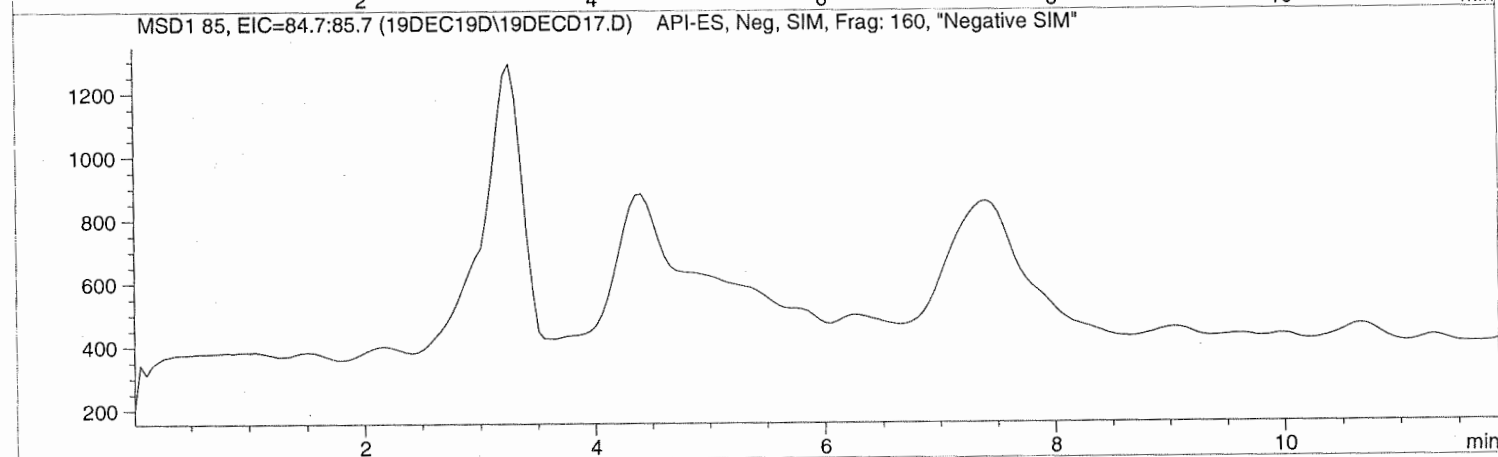
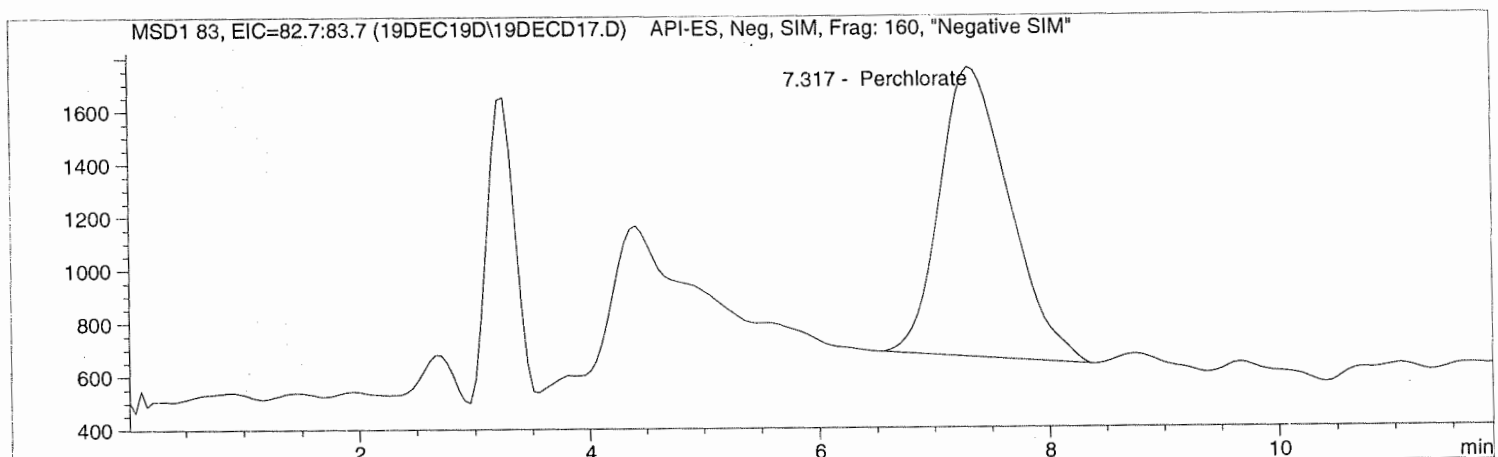
Sample Name: 1934611002

=====
Injection Date: 12/19/2019 12:33:05
Sample Name: 1934611002
Acq Operator: TNB

Seq Line: 17
Location: Vial 86
Inj. No.: 1
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis
=====



Data file: C:\HPCHEM\1\DATA\19DEC19D\19DECD17.D

Sample Name: 1934611002

```

=====
Injection Date: 12/19/2019 12:33:05      Seq Line: 17
Sample Name: 1934611002                  Location: Vial 86
Acq Operator: TNB                        Inj. No.: 1
                                           Inj. Vol.: 35 µl
=====

```

```

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By: Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 0.000
=====

```

```

=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.317	PBA	45813.6	0.6291	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.373	PBA	245674.1	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```



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

December 23, 2019

Marcia Olive
Bhate Environmental Associates, Inc.
445 Union Blvd Ste 129
Lakewood, CO 80228

Work Order: **HS19120544**

Laboratory Results for: **LHAAP 18 24**

Dear Marcia,

ALS Environmental received 8 sample(s) on Dec 10, 2019 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: JUMOKE.LAWAL
RJ Modashia
Project Manager

ALS Houston, US

Date: 23-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Work Order: HS19120544

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19120544-01	MW19_120919	Groundwater		09-Dec-2019 08:15	10-Dec-2019 09:15	<input type="checkbox"/>
HS19120544-02	18WW10_120919	Groundwater		09-Dec-2019 09:05	10-Dec-2019 09:15	<input type="checkbox"/>
HS19120544-03	18WW06_120919	Groundwater		09-Dec-2019 09:55	10-Dec-2019 09:15	<input type="checkbox"/>
HS19120544-04	18WW02_120919	Groundwater		09-Dec-2019 10:45	10-Dec-2019 09:15	<input type="checkbox"/>
HS19120544-05	MW16_120919	Groundwater		09-Dec-2019 11:40	10-Dec-2019 09:15	<input type="checkbox"/>
HS19120544-06	18CptMW23_120919	Groundwater		09-Dec-2019 12:30	10-Dec-2019 09:15	<input type="checkbox"/>
HS19120544-07	18CptMW14_120919	Groundwater		09-Dec-2019 13:20	10-Dec-2019 09:15	<input type="checkbox"/>
HS19120544-08	Trip Blank CG-101419-15	Water		09-Dec-2019 00:00	10-Dec-2019 09:15	<input type="checkbox"/>

ALS Houston, US

Date: 23-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Work Order: HS19120544

CASE NARRATIVE

Work Order Comments

- The analysis for Perchlorate was subcontracted to ALS Salt Lake City, UT. Final report attached.

GCMS Semivolatiles by Method SW8270SIM**Batch ID: 148571****Sample ID: LCSD-148571**

- The RPD between the LCS and LCSD was outside of the control limit.

GCMS Volatiles by Method SW8260**Batch ID: R352551****Sample ID: VLCSW-191215**

- 1,2,3-Trichlorobenzene and 1,2,4-Trichlorobenzene exceeded QC limits for LCS. CCV is OK. Samples are ND for these compounds..

Sample ID: HS19120678-01MS

- MS and MSD are for an unrelated sample

Metals by Method SW7470**Batch ID: 148663**

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

Metals by Method SW6020**Batch ID: 148640****Sample ID: HS19120386-01MS**

- MS/MSD and DUPs are for an unrelated sample
-

ALS Houston, US

Date: 23-Dec-19

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP 18 24
 Sample ID: MW19_120919
 Collection Date: 09-Dec-2019 08:15

ANALYTICAL REPORT
 WorkOrder:HS19120544
 Lab ID:HS19120544-01
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED	
VOLATILES ORGANICS BY METHOD		Method:SW8260							Analyst: PC
8260C									
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 20:17	
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 20:17	
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	15-Dec-2019 20:17	
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 20:17	
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 20:17	
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 20:17	
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 20:17	
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Dec-2019 20:17	
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	15-Dec-2019 20:17	
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	15-Dec-2019 20:17	
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 20:17	
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 20:17	
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 20:17	
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	15-Dec-2019 20:17	
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 20:17	
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	15-Dec-2019 20:17	
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 20:17	
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Dec-2019 20:17	
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 20:17	
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Dec-2019 20:17	
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 20:17	
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	15-Dec-2019 20:17	
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 20:17	
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	15-Dec-2019 20:17	
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Dec-2019 20:17	
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 20:17	
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	15-Dec-2019 20:17	
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	15-Dec-2019 20:17	
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 20:17	
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Dec-2019 20:17	
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 20:17	
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 20:17	
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	15-Dec-2019 20:17	
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	15-Dec-2019 20:17	
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	15-Dec-2019 20:17	
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	15-Dec-2019 20:17	
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 20:17	
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 20:17	
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 20:17	

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

ALS Houston, US

Date: 23-Dec-19

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP 18 24
 Sample ID: MW19_120919
 Collection Date: 09-Dec-2019 08:15

ANALYTICAL REPORT
 WorkOrder:HS19120544
 Lab ID:HS19120544-01
 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-2019 20:17	
cis-1,2-Dichloroethene	2.7		0.20	0.50	1.0	UG/L	1	15-Dec-2019 20:17	
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	15-Dec-2019 20:17	
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 20:17	
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 20:17	
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 20:17	
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 20:17	
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	UG/L	1	15-Dec-2019 20:17	
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 20:17	
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	15-Dec-2019 20:17	
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	15-Dec-2019 20:17	
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Dec-2019 20:17	
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 20:17	
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 20:17	
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 20:17	
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 20:17	
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 20:17	
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 20:17	
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 20:17	
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 20:17	
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 20:17	
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 20:17	
Trichloroethene	1.2		0.20	0.50	1.0	UG/L	1	15-Dec-2019 20:17	
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 20:17	
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 20:17	
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>91.7</i>			0	<i>81-118</i>	%REC	1	15-Dec-2019 20:17	
<i>Surr: 4-Bromofluorobenzene</i>	<i>101</i>			0	<i>85-114</i>	%REC	1	15-Dec-2019 20:17	
<i>Surr: Dibromofluoromethane</i>	<i>93.0</i>			0	<i>80-119</i>	%REC	1	15-Dec-2019 20:17	
<i>Surr: Toluene-d8</i>	<i>102</i>			0	<i>89-112</i>	%REC	1	15-Dec-2019 20:17	

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

ALS Houston, US

Date: 23-Dec-19

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP 18 24
 Sample ID: MW19_120919
 Collection Date: 09-Dec-2019 08:15

ANALYTICAL REPORT
 WorkOrder:HS19120544
 Lab ID:HS19120544-01
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A			Method:SW6020			Prep:SW3010A / 13-Dec-2019		Analyst: JHD
Aluminum	0.461		0.00180	0.00500	0.0100	mg/L	1	17-Dec-2019 11:33
Antimony	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	17-Dec-2019 11:33
Arsenic	0.00705		0.000400	0.000500	0.00500	mg/L	1	17-Dec-2019 11:33
Barium	0.547		0.00190	0.00250	0.00500	mg/L	1	17-Dec-2019 11:33
Beryllium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	17-Dec-2019 11:33
Cadmium	0.000382	J	0.000200	0.000500	0.00200	mg/L	1	17-Dec-2019 11:33
Calcium	110		0.0340	0.0500	0.500	mg/L	1	17-Dec-2019 11:33
Chromium	0.0839		0.000400	0.000500	0.00500	mg/L	1	17-Dec-2019 11:33
Cobalt	0.0106		0.000100	0.000500	0.00500	mg/L	1	17-Dec-2019 11:33
Copper	0.00372	J	0.00100	0.00250	0.00500	mg/L	1	17-Dec-2019 11:33
Iron	88.9		0.0120	0.0500	0.200	mg/L	1	17-Dec-2019 11:33
Lead	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	17-Dec-2019 11:33
Magnesium	60.4		0.0100	0.0500	0.200	mg/L	1	17-Dec-2019 11:33
Manganese	2.23		0.0140	0.0500	0.100	mg/L	20	17-Dec-2019 12:33
Nickel	0.0736		0.000600	0.00100	0.00500	mg/L	1	17-Dec-2019 11:33
Potassium	4.48		0.0180	0.0500	0.200	mg/L	1	17-Dec-2019 11:33
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	17-Dec-2019 11:33
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	17-Dec-2019 11:33
Sodium	852		0.280	1.00	4.00	mg/L	20	17-Dec-2019 12:33
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	17-Dec-2019 11:33
Vanadium	0.00207	J	0.000600	0.00100	0.00500	mg/L	1	17-Dec-2019 11:33
Zinc	0.0123		0.00200	0.00250	0.00500	mg/L	1	17-Dec-2019 11:33
MERCURY BY SW7470A			Method:SW7470			Prep:SW7470 / 13-Dec-2019		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	13-Dec-2019 15:44
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)			Method:NA			Analyst: SUB		
Subcontract Analysis	See Attached		0	0		NA	1	23-Dec-2019 17:05

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

ALS Houston, US

Date: 23-Dec-19

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP 18 24
 Sample ID: 18WW10_120919
 Collection Date: 09-Dec-2019 09:05

ANALYTICAL REPORT
 WorkOrder:HS19120544
 Lab ID:HS19120544-02
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED	
VOLATILES ORGANICS BY METHOD 8260C		Method:SW8260							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 20:41	
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 20:41	
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	15-Dec-2019 20:41	
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 20:41	
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 20:41	
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 20:41	
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 20:41	
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Dec-2019 20:41	
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	15-Dec-2019 20:41	
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	15-Dec-2019 20:41	
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 20:41	
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 20:41	
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 20:41	
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	15-Dec-2019 20:41	
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 20:41	
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	15-Dec-2019 20:41	
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 20:41	
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Dec-2019 20:41	
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 20:41	
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Dec-2019 20:41	
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 20:41	
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	15-Dec-2019 20:41	
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 20:41	
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	15-Dec-2019 20:41	
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Dec-2019 20:41	
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 20:41	
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	15-Dec-2019 20:41	
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	15-Dec-2019 20:41	
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 20:41	
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Dec-2019 20:41	
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 20:41	
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 20:41	
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	15-Dec-2019 20:41	
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	15-Dec-2019 20:41	
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	15-Dec-2019 20:41	
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	15-Dec-2019 20:41	
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 20:41	
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 20:41	
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 20:41	

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

ALS Houston, US

Date: 23-Dec-19

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP 18 24
 Sample ID: 18WW10_120919
 Collection Date: 09-Dec-2019 09:05

ANALYTICAL REPORT
 WorkOrder:HS19120544
 Lab ID:HS19120544-02
 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	15-Dec-2019 20:41	
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 20:41	
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	15-Dec-2019 20:41	
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 20:41	
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 20:41	
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 20:41	
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 20:41	
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	UG/L	1	15-Dec-2019 20:41	
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 20:41	
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	15-Dec-2019 20:41	
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	15-Dec-2019 20:41	
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Dec-2019 20:41	
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 20:41	
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 20:41	
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 20:41	
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 20:41	
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 20:41	
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 20:41	
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 20:41	
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 20:41	
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 20:41	
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 20:41	
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 20:41	
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 20:41	
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 20:41	
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>91.3</i>			0	<i>81-118</i>	%REC	1	<i>15-Dec-2019 20:41</i>	
<i>Surr: 4-Bromofluorobenzene</i>	<i>101</i>			0	<i>85-114</i>	%REC	1	<i>15-Dec-2019 20:41</i>	
<i>Surr: Dibromofluoromethane</i>	<i>93.4</i>			0	<i>80-119</i>	%REC	1	<i>15-Dec-2019 20:41</i>	
<i>Surr: Toluene-d8</i>	<i>102</i>			0	<i>89-112</i>	%REC	1	<i>15-Dec-2019 20:41</i>	
SEMIVOLATILES SIM		Method:SW8270SIM						Prep:SW3510 / 12-Dec-2019 Analyst: LG	
1,4-Dioxane	0.010	U	0.010	0.010	0.010	ug/L	1	20-Dec-2019 09:52	
<i>Surr: 2-Fluorobiphenyl</i>	<i>120</i>			0	<i>40-140</i>	%REC	1	<i>20-Dec-2019 09:52</i>	
<i>Surr: 4-Terphenyl-d14</i>	<i>117</i>			0	<i>40-140</i>	%REC	1	<i>20-Dec-2019 09:52</i>	
<i>Surr: Nitrobenzene-d5</i>	<i>90.1</i>			0	<i>40-140</i>	%REC	1	<i>20-Dec-2019 09:52</i>	
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		Method:NA						Analyst: SUB	
Subcontract Analysis	See Attached		0	0		NA	1	23-Dec-2019 17:05	

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

ALS Houston, US

Date: 23-Dec-19

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP 18 24
 Sample ID: 18WW06_120919
 Collection Date: 09-Dec-2019 09:55

ANALYTICAL REPORT
 WorkOrder:HS19120544
 Lab ID:HS19120544-03
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED	
VOLATILES ORGANICS BY METHOD 8260C		Method:SW8260							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 21:05	
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 21:05	
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	15-Dec-2019 21:05	
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 21:05	
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 21:05	
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 21:05	
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 21:05	
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Dec-2019 21:05	
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	15-Dec-2019 21:05	
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	15-Dec-2019 21:05	
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 21:05	
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 21:05	
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 21:05	
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	15-Dec-2019 21:05	
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 21:05	
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	15-Dec-2019 21:05	
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 21:05	
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Dec-2019 21:05	
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 21:05	
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Dec-2019 21:05	
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 21:05	
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	15-Dec-2019 21:05	
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 21:05	
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	15-Dec-2019 21:05	
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Dec-2019 21:05	
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 21:05	
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	15-Dec-2019 21:05	
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	15-Dec-2019 21:05	
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 21:05	
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Dec-2019 21:05	
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 21:05	
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 21:05	
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	15-Dec-2019 21:05	
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	15-Dec-2019 21:05	
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	15-Dec-2019 21:05	
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	15-Dec-2019 21:05	
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 21:05	
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 21:05	
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 21:05	

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

ALS Houston, US

Date: 23-Dec-19

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP 18 24
 Sample ID: 18WW06_120919
 Collection Date: 09-Dec-2019 09:55

ANALYTICAL REPORT
 WorkOrder:HS19120544
 Lab ID:HS19120544-03
 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	15-Dec-2019 21:05	
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 21:05	
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	15-Dec-2019 21:05	
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 21:05	
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 21:05	
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 21:05	
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 21:05	
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	UG/L	1	15-Dec-2019 21:05	
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 21:05	
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	15-Dec-2019 21:05	
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	15-Dec-2019 21:05	
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Dec-2019 21:05	
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 21:05	
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 21:05	
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 21:05	
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 21:05	
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 21:05	
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 21:05	
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 21:05	
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 21:05	
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 21:05	
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 21:05	
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 21:05	
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 21:05	
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 21:05	
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>91.0</i>			0	<i>81-118</i>	%REC	1	<i>15-Dec-2019 21:05</i>	
<i>Surr: 4-Bromofluorobenzene</i>	<i>102</i>			0	<i>85-114</i>	%REC	1	<i>15-Dec-2019 21:05</i>	
<i>Surr: Dibromofluoromethane</i>	<i>93.2</i>			0	<i>80-119</i>	%REC	1	<i>15-Dec-2019 21:05</i>	
<i>Surr: Toluene-d8</i>	<i>99.9</i>			0	<i>89-112</i>	%REC	1	<i>15-Dec-2019 21:05</i>	
SEMIVOLATILES SIM		Method:SW8270SIM				Prep:SW3510 / 12-Dec-2019		Analyst: LG	
1,4-Dioxane	0.010	U	0.010	0.010	0.010	ug/L	1	20-Dec-2019 10:11	
<i>Surr: 2-Fluorobiphenyl</i>	<i>109</i>			0	<i>40-140</i>	%REC	1	<i>20-Dec-2019 10:11</i>	
<i>Surr: 4-Terphenyl-d14</i>	<i>86.0</i>			0	<i>40-140</i>	%REC	1	<i>20-Dec-2019 10:11</i>	
<i>Surr: Nitrobenzene-d5</i>	<i>92.0</i>			0	<i>40-140</i>	%REC	1	<i>20-Dec-2019 10:11</i>	
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		Method:NA						Analyst: SUB	
Subcontract Analysis	See Attached		0	0		NA	1	23-Dec-2019 17:05	

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

ALS Houston, US

Date: 23-Dec-19

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP 18 24
 Sample ID: 18WW02_120919
 Collection Date: 09-Dec-2019 10:45

ANALYTICAL REPORT

WorkOrder:HS19120544
 Lab ID:HS19120544-04
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD		Method:SW8260						
8260C								Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 21:29
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 21:29
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	15-Dec-2019 21:29
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 21:29
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 21:29
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 21:29
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 21:29
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Dec-2019 21:29
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	15-Dec-2019 21:29
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	15-Dec-2019 21:29
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 21:29
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 21:29
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 21:29
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	15-Dec-2019 21:29
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 21:29
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	15-Dec-2019 21:29
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 21:29
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Dec-2019 21:29
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 21:29
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Dec-2019 21:29
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 21:29
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	15-Dec-2019 21:29
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 21:29
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	15-Dec-2019 21:29
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Dec-2019 21:29
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 21:29
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	15-Dec-2019 21:29
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	15-Dec-2019 21:29
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 21:29
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Dec-2019 21:29
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 21:29
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 21:29
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	15-Dec-2019 21:29
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	15-Dec-2019 21:29
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	15-Dec-2019 21:29
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	15-Dec-2019 21:29
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 21:29
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 21:29
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 21:29

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

ALS Houston, US

Date: 23-Dec-19

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP 18 24
 Sample ID: 18WW02_120919
 Collection Date: 09-Dec-2019 10:45

ANALYTICAL REPORT
 WorkOrder:HS19120544
 Lab ID:HS19120544-04
 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	15-Dec-2019 21:29	
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 21:29	
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	15-Dec-2019 21:29	
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 21:29	
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 21:29	
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 21:29	
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 21:29	
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	UG/L	1	15-Dec-2019 21:29	
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 21:29	
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	15-Dec-2019 21:29	
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	15-Dec-2019 21:29	
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Dec-2019 21:29	
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 21:29	
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 21:29	
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 21:29	
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 21:29	
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 21:29	
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 21:29	
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 21:29	
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 21:29	
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 21:29	
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 21:29	
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 21:29	
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 21:29	
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 21:29	
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>91.2</i>			<i>0</i>	<i>81-118</i>	<i>%REC</i>	<i>1</i>	<i>15-Dec-2019 21:29</i>	
<i>Surr: 4-Bromofluorobenzene</i>	<i>98.4</i>			<i>0</i>	<i>85-114</i>	<i>%REC</i>	<i>1</i>	<i>15-Dec-2019 21:29</i>	
<i>Surr: Dibromofluoromethane</i>	<i>94.9</i>			<i>0</i>	<i>80-119</i>	<i>%REC</i>	<i>1</i>	<i>15-Dec-2019 21:29</i>	
<i>Surr: Toluene-d8</i>	<i>102</i>			<i>0</i>	<i>89-112</i>	<i>%REC</i>	<i>1</i>	<i>15-Dec-2019 21:29</i>	
SEMIVOLATILES SIM		Method:SW8270SIM				Prep:SW3510 / 12-Dec-2019		Analyst: LG	
1,4-Dioxane	0.010	U	0.010	0.010	0.010	ug/L	1	20-Dec-2019 10:30	
<i>Surr: 2-Fluorobiphenyl</i>	<i>136</i>			<i>0</i>	<i>40-140</i>	<i>%REC</i>	<i>1</i>	<i>20-Dec-2019 10:30</i>	
<i>Surr: 4-Terphenyl-d14</i>	<i>101</i>			<i>0</i>	<i>40-140</i>	<i>%REC</i>	<i>1</i>	<i>20-Dec-2019 10:30</i>	
<i>Surr: Nitrobenzene-d5</i>	<i>103</i>			<i>0</i>	<i>40-140</i>	<i>%REC</i>	<i>1</i>	<i>20-Dec-2019 10:30</i>	

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

ALS Houston, US

Date: 23-Dec-19

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP 18 24
 Sample ID: 18WW02_120919
 Collection Date: 09-Dec-2019 10:45

ANALYTICAL REPORT
 WorkOrder:HS19120544
 Lab ID:HS19120544-04
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A		Method:SW6020				Prep:SW3010A / 13-Dec-2019		Analyst: JHD
Aluminum	0.268		0.00180	0.00500	0.0100	mg/L	1	17-Dec-2019 11:36
Antimony	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	17-Dec-2019 11:36
Arsenic	0.000627	J	0.000400	0.000500	0.00500	mg/L	1	17-Dec-2019 11:36
Barium	0.0407		0.00190	0.00250	0.00500	mg/L	1	17-Dec-2019 11:36
Beryllium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	17-Dec-2019 11:36
Cadmium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	17-Dec-2019 11:36
Calcium	6.86		0.0340	0.0500	0.500	mg/L	1	17-Dec-2019 11:36
Chromium	0.0104		0.000400	0.000500	0.00500	mg/L	1	17-Dec-2019 11:36
Cobalt	0.000280	J	0.000100	0.000500	0.00500	mg/L	1	17-Dec-2019 11:36
Copper	0.00499	J	0.00100	0.00250	0.00500	mg/L	1	17-Dec-2019 11:36
Iron	1.87		0.0120	0.0500	0.200	mg/L	1	17-Dec-2019 11:36
Lead	0.000841	J	0.000600	0.00100	0.00500	mg/L	1	17-Dec-2019 11:36
Magnesium	1.22		0.0100	0.0500	0.200	mg/L	1	17-Dec-2019 11:36
Manganese	0.0860		0.000700	0.00250	0.00500	mg/L	1	17-Dec-2019 11:36
Nickel	0.00775		0.000600	0.00100	0.00500	mg/L	1	17-Dec-2019 11:36
Potassium	1.78		0.0180	0.0500	0.200	mg/L	1	17-Dec-2019 11:36
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	17-Dec-2019 11:36
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	17-Dec-2019 11:36
Sodium	23.7		0.0140	0.0500	0.200	mg/L	1	17-Dec-2019 11:36
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	17-Dec-2019 11:36
Vanadium	0.00222	J	0.000600	0.00100	0.00500	mg/L	1	17-Dec-2019 11:36
Zinc	0.00466	J	0.00200	0.00250	0.00500	mg/L	1	17-Dec-2019 11:36
MERCURY BY SW7470A		Method:SW7470				Prep:SW7470 / 13-Dec-2019		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	13-Dec-2019 15:45
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		Method:NA				Analyst: SUB		
Subcontract Analysis	See Attached		0	0		NA	1	23-Dec-2019 17:05

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

ALS Houston, US

Date: 23-Dec-19

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP 18 24
 Sample ID: MW16_120919
 Collection Date: 09-Dec-2019 11:40

ANALYTICAL REPORT
 WorkOrder:HS19120544
 Lab ID:HS19120544-05
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED	
VOLATILES ORGANICS BY METHOD 8260C		Method:SW8260							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 16:16	
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 16:16	
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	15-Dec-2019 16:16	
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 16:16	
1,1-Dichloroethane	1.4		0.20	0.50	1.0	UG/L	1	15-Dec-2019 16:16	
1,1-Dichloroethene	6.1		0.20	0.50	1.0	UG/L	1	15-Dec-2019 16:16	
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 16:16	
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Dec-2019 16:16	
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	15-Dec-2019 16:16	
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	15-Dec-2019 16:16	
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 16:16	
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 16:16	
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 16:16	
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	15-Dec-2019 16:16	
1,2-Dichloroethane	43		0.20	0.50	1.0	UG/L	1	15-Dec-2019 16:16	
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	15-Dec-2019 16:16	
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 16:16	
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Dec-2019 16:16	
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 16:16	
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Dec-2019 16:16	
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 16:16	
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	15-Dec-2019 16:16	
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 16:16	
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	15-Dec-2019 16:16	
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Dec-2019 16:16	
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 16:16	
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	15-Dec-2019 16:16	
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	15-Dec-2019 16:16	
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 16:16	
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Dec-2019 16:16	
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 16:16	
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 16:16	
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	15-Dec-2019 16:16	
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	15-Dec-2019 16:16	
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	15-Dec-2019 16:16	
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	15-Dec-2019 16:16	
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 16:16	
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 16:16	
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 16:16	

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

ALS Houston, US

Date: 23-Dec-19

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP 18 24
 Sample ID: MW16_120919
 Collection Date: 09-Dec-2019 11:40

ANALYTICAL REPORT
 WorkOrder:HS19120544
 Lab ID:HS19120544-05
 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	15-Dec-2019 16:16	
cis-1,2-Dichloroethene	24		0.20	0.50	1.0	UG/L	1	15-Dec-2019 16:16	
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	15-Dec-2019 16:16	
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 16:16	
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 16:16	
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 16:16	
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 16:16	
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	UG/L	1	15-Dec-2019 16:16	
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 16:16	
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	15-Dec-2019 16:16	
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	15-Dec-2019 16:16	
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Dec-2019 16:16	
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 16:16	
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 16:16	
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 16:16	
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 16:16	
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 16:16	
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 16:16	
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 16:16	
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 16:16	
trans-1,2-Dichloroethene	0.53	J	0.20	0.50	1.0	UG/L	1	15-Dec-2019 16:16	
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 16:16	
Trichloroethene	550		5.0	12	25	UG/L	25	15-Dec-2019 18:40	
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 16:16	
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 16:16	
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>90.5</i>			0	<i>81-118</i>	%REC	1	15-Dec-2019 16:16	
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>91.2</i>			0	<i>81-118</i>	%REC	25	15-Dec-2019 18:40	
<i>Surr: 4-Bromofluorobenzene</i>	<i>99.8</i>			0	<i>85-114</i>	%REC	1	15-Dec-2019 16:16	
<i>Surr: 4-Bromofluorobenzene</i>	<i>101</i>			0	<i>85-114</i>	%REC	25	15-Dec-2019 18:40	
<i>Surr: Dibromofluoromethane</i>	<i>94.1</i>			0	<i>80-119</i>	%REC	1	15-Dec-2019 16:16	
<i>Surr: Dibromofluoromethane</i>	<i>93.7</i>			0	<i>80-119</i>	%REC	25	15-Dec-2019 18:40	
<i>Surr: Toluene-d8</i>	<i>101</i>			0	<i>89-112</i>	%REC	1	15-Dec-2019 16:16	
<i>Surr: Toluene-d8</i>	<i>101</i>			0	<i>89-112</i>	%REC	25	15-Dec-2019 18:40	
SEMIVOLATILES SIM		Method:SW8270SIM							Prep:SW3510 / 12-Dec-2019
1,4-Dioxane	23		1.0	1.0	1.0	ug/L	100	20-Dec-2019 11:46	
<i>Surr: 2-Fluorobiphenyl</i>	<i>122</i>			0	<i>40-140</i>	%REC	100	20-Dec-2019 11:46	
<i>Surr: 4-Terphenyl-d14</i>	<i>131</i>			0	<i>40-140</i>	%REC	100	20-Dec-2019 11:46	
<i>Surr: Nitrobenzene-d5</i>	<i>120</i>			0	<i>40-140</i>	%REC	100	20-Dec-2019 11:46	

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

ALS Houston, US

Date: 23-Dec-19

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP 18 24
 Sample ID: MW16_120919
 Collection Date: 09-Dec-2019 11:40

ANALYTICAL REPORT

WorkOrder:HS19120544
 Lab ID:HS19120544-05
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED	
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		Method:NA						Analyst: SUB	
Subcontract Analysis	See Attached		0	0		NA	1	23-Dec-2019 17:05	

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

ALS Houston, US

Date: 23-Dec-19

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP 18 24
 Sample ID: 18CptMW23_120919
 Collection Date: 09-Dec-2019 12:30

ANALYTICAL REPORT

WorkOrder:HS19120544
 Lab ID:HS19120544-06
 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	5.0	U	3.0	5.0	10	UG/L	10	15-Dec-2019 17:28	
1,1,1-Trichloroethane	5.0	U	2.0	5.0	10	UG/L	10	15-Dec-2019 17:28	
1,1,2,2-Tetrachloroethane	5.0	U	5.0	5.0	10	UG/L	10	15-Dec-2019 17:28	
1,1,2-Trichloroethane	5.0	U	3.0	5.0	10	UG/L	10	15-Dec-2019 17:28	
1,1-Dichloroethane	5.0	U	2.0	5.0	10	UG/L	10	15-Dec-2019 17:28	
1,1-Dichloroethene	5.0	U	2.0	5.0	10	UG/L	10	15-Dec-2019 17:28	
1,1-Dichloropropene	5.0	U	3.0	5.0	10	UG/L	10	15-Dec-2019 17:28	
1,2,3-Trichlorobenzene	5.0	U	4.0	5.0	10	UG/L	10	15-Dec-2019 17:28	
1,2,3-Trichloropropane	5.0	U	5.0	5.0	10	UG/L	10	15-Dec-2019 17:28	
1,2,4-Trichlorobenzene	5.0	U	5.0	5.0	10	UG/L	10	15-Dec-2019 17:28	
1,2,4-Trimethylbenzene	5.0	U	3.0	5.0	10	UG/L	10	15-Dec-2019 17:28	
1,2-Dibromo-3-chloropropane	5.0	U	2.0	5.0	10	UG/L	10	15-Dec-2019 17:28	
1,2-Dibromoethane	5.0	U	2.0	5.0	10	UG/L	10	15-Dec-2019 17:28	
1,2-Dichlorobenzene	5.0	U	5.0	5.0	10	UG/L	10	15-Dec-2019 17:28	
1,2-Dichloroethane	140		2.0	5.0	10	UG/L	10	15-Dec-2019 17:28	
1,2-Dichloropropane	5.0	U	5.0	5.0	10	UG/L	10	15-Dec-2019 17:28	
1,3,5-Trimethylbenzene	5.0	U	3.0	5.0	10	UG/L	10	15-Dec-2019 17:28	
1,3-Dichlorobenzene	5.0	U	4.0	5.0	10	UG/L	10	15-Dec-2019 17:28	
1,3-Dichloropropane	5.0	U	3.0	5.0	10	UG/L	10	15-Dec-2019 17:28	
1,4-Dichlorobenzene	5.0	U	4.0	5.0	10	UG/L	10	15-Dec-2019 17:28	
2,2-Dichloropropane	5.0	U	2.0	5.0	10	UG/L	10	15-Dec-2019 17:28	
2-Butanone	10	U	5.0	10	20	UG/L	10	15-Dec-2019 17:28	
2-Chlorotoluene	5.0	U	3.0	5.0	10	UG/L	10	15-Dec-2019 17:28	
2-Hexanone	10	U	10	10	20	UG/L	10	15-Dec-2019 17:28	
4-Chlorotoluene	5.0	U	4.0	5.0	10	UG/L	10	15-Dec-2019 17:28	
4-Isopropyltoluene	5.0	U	3.0	5.0	10	UG/L	10	15-Dec-2019 17:28	
4-Methyl-2-pentanone	10	U	7.0	10	20	UG/L	10	15-Dec-2019 17:28	
Acetone	10	U	4.0	10	20	UG/L	10	15-Dec-2019 17:28	
Benzene	5.0	U	2.0	5.0	10	UG/L	10	15-Dec-2019 17:28	
Bromobenzene	5.0	U	4.0	5.0	10	UG/L	10	15-Dec-2019 17:28	
Bromochloromethane	5.0	U	2.0	5.0	10	UG/L	10	15-Dec-2019 17:28	
Bromodichloromethane	5.0	U	2.0	5.0	10	UG/L	10	15-Dec-2019 17:28	
Bromoform	5.0	U	4.0	5.0	10	UG/L	10	15-Dec-2019 17:28	
Bromomethane	5.0	U	4.0	5.0	10	UG/L	10	15-Dec-2019 17:28	
Carbon disulfide	10	U	6.0	10	20	UG/L	10	15-Dec-2019 17:28	
Carbon tetrachloride	5.0	U	5.0	5.0	10	UG/L	10	15-Dec-2019 17:28	
Chlorobenzene	5.0	U	3.0	5.0	10	UG/L	10	15-Dec-2019 17:28	
Chloroethane	5.0	U	3.0	5.0	10	UG/L	10	15-Dec-2019 17:28	
Chloroform	5.0	U	2.0	5.0	10	UG/L	10	15-Dec-2019 17:28	

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

ALS Houston, US

Date: 23-Dec-19

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP 18 24
 Sample ID: 18CptMW23_120919
 Collection Date: 09-Dec-2019 12:30

ANALYTICAL REPORT
 WorkOrder:HS19120544
 Lab ID:HS19120544-06
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED	
VOLATILES ORGANICS BY METHOD 8260C		Method:SW8260						Analyst: PC	
Chloromethane	5.0	U	2.0	5.0	10	UG/L	10	15-Dec-2019 17:28	
cis-1,2-Dichloroethene	220		2.0	5.0	10	UG/L	10	15-Dec-2019 17:28	
cis-1,3-Dichloropropene	5.0	U	1.0	5.0	10	UG/L	10	15-Dec-2019 17:28	
Dibromochloromethane	5.0	U	3.0	5.0	10	UG/L	10	15-Dec-2019 17:28	
Dibromomethane	5.0	U	2.0	5.0	10	UG/L	10	15-Dec-2019 17:28	
Dichlorodifluoromethane	5.0	U	3.0	5.0	10	UG/L	10	15-Dec-2019 17:28	
Ethylbenzene	5.0	U	3.0	5.0	10	UG/L	10	15-Dec-2019 17:28	
Hexachlorobutadiene	5.0	U	10	5.0	10	UG/L	10	15-Dec-2019 17:28	
Isopropylbenzene	5.0	U	3.0	5.0	10	UG/L	10	15-Dec-2019 17:28	
m,p-Xylene	10	U	5.0	10	20	UG/L	10	15-Dec-2019 17:28	
Methylene chloride	10	U	4.0	10	20	UG/L	10	15-Dec-2019 17:28	
n-Butylbenzene	5.0	U	4.0	5.0	10	UG/L	10	15-Dec-2019 17:28	
n-Propylbenzene	5.0	U	3.0	5.0	10	UG/L	10	15-Dec-2019 17:28	
Naphthalene	5.0	U	3.0	5.0	10	UG/L	10	15-Dec-2019 17:28	
o-Xylene	5.0	U	3.0	5.0	10	UG/L	10	15-Dec-2019 17:28	
sec-Butylbenzene	5.0	U	3.0	5.0	10	UG/L	10	15-Dec-2019 17:28	
Styrene	5.0	U	3.0	5.0	10	UG/L	10	15-Dec-2019 17:28	
tert-Butylbenzene	5.0	U	3.0	5.0	10	UG/L	10	15-Dec-2019 17:28	
Tetrachloroethene	5.0	U	3.0	5.0	10	UG/L	10	15-Dec-2019 17:28	
Toluene	5.0	U	2.0	5.0	10	UG/L	10	15-Dec-2019 17:28	
trans-1,2-Dichloroethene	5.0	U	2.0	5.0	10	UG/L	10	15-Dec-2019 17:28	
trans-1,3-Dichloropropene	5.0	U	2.0	5.0	10	UG/L	10	15-Dec-2019 17:28	
Trichloroethene	2,800		20	50	100	UG/L	100	15-Dec-2019 19:28	
Trichlorofluoromethane	5.0	U	3.0	5.0	10	UG/L	10	15-Dec-2019 17:28	
Vinyl chloride	5.0	U	2.0	5.0	10	UG/L	10	15-Dec-2019 17:28	
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>92.6</i>			0	<i>81-118</i>	%REC	<i>10</i>	<i>15-Dec-2019 17:28</i>	
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>92.2</i>			0	<i>81-118</i>	%REC	<i>100</i>	<i>15-Dec-2019 19:28</i>	
<i>Surr: 4-Bromofluorobenzene</i>	<i>100</i>			0	<i>85-114</i>	%REC	<i>10</i>	<i>15-Dec-2019 17:28</i>	
<i>Surr: 4-Bromofluorobenzene</i>	<i>101</i>			0	<i>85-114</i>	%REC	<i>100</i>	<i>15-Dec-2019 19:28</i>	
<i>Surr: Dibromofluoromethane</i>	<i>92.6</i>			0	<i>80-119</i>	%REC	<i>10</i>	<i>15-Dec-2019 17:28</i>	
<i>Surr: Dibromofluoromethane</i>	<i>94.3</i>			0	<i>80-119</i>	%REC	<i>100</i>	<i>15-Dec-2019 19:28</i>	
<i>Surr: Toluene-d8</i>	<i>101</i>			0	<i>89-112</i>	%REC	<i>10</i>	<i>15-Dec-2019 17:28</i>	
<i>Surr: Toluene-d8</i>	<i>102</i>			0	<i>89-112</i>	%REC	<i>100</i>	<i>15-Dec-2019 19:28</i>	
SEMIVOLATILES SIM		Method:SW8270SIM						Prep:SW3510 / 12-Dec-2019 Analyst: LG	
1,4-Dioxane	15		1.0	1.0	1.0	ug/L	100	20-Dec-2019 12:05	
<i>Surr: 2-Fluorobiphenyl</i>	<i>122</i>			0	<i>40-140</i>	%REC	<i>100</i>	<i>20-Dec-2019 12:05</i>	
<i>Surr: 4-Terphenyl-d14</i>	<i>120</i>			0	<i>40-140</i>	%REC	<i>100</i>	<i>20-Dec-2019 12:05</i>	
<i>Surr: Nitrobenzene-d5</i>	<i>89.6</i>			0	<i>40-140</i>	%REC	<i>100</i>	<i>20-Dec-2019 12:05</i>	

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

ALS Houston, US

Date: 23-Dec-19

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP 18 24
 Sample ID: 18CptMW23_120919
 Collection Date: 09-Dec-2019 12:30

ANALYTICAL REPORT

WorkOrder:HS19120544
 Lab ID:HS19120544-06
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		Method:NA		Analyst: SUB				
Subcontract Analysis	See Attached		0	0		NA	1	23-Dec-2019 17:05

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

ALS Houston, US

Date: 23-Dec-19

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP 18 24
 Sample ID: 18CptMW14_120919
 Collection Date: 09-Dec-2019 13:20

ANALYTICAL REPORT
 WorkOrder:HS19120544
 Lab ID:HS19120544-07
 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	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 17:04	
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 17:04	
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	15-Dec-2019 17:04	
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 17:04	
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 17:04	
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 17:04	
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 17:04	
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Dec-2019 17:04	
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	15-Dec-2019 17:04	
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	15-Dec-2019 17:04	
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 17:04	
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 17:04	
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 17:04	
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	15-Dec-2019 17:04	
1,2-Dichloroethane	3.3		0.20	0.50	1.0	UG/L	1	15-Dec-2019 17:04	
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	15-Dec-2019 17:04	
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 17:04	
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Dec-2019 17:04	
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 17:04	
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Dec-2019 17:04	
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 17:04	
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	15-Dec-2019 17:04	
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 17:04	
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	15-Dec-2019 17:04	
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Dec-2019 17:04	
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 17:04	
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	15-Dec-2019 17:04	
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	15-Dec-2019 17:04	
Benzene	2.6		0.20	0.50	1.0	UG/L	1	15-Dec-2019 17:04	
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Dec-2019 17:04	
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 17:04	
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 17:04	
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	15-Dec-2019 17:04	
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	15-Dec-2019 17:04	
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	15-Dec-2019 17:04	
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	15-Dec-2019 17:04	
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 17:04	
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 17:04	
Chloroform	11		0.20	0.50	1.0	UG/L	1	15-Dec-2019 17:04	

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

ALS Houston, US

Date: 23-Dec-19

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP 18 24
 Sample ID: 18CptMW14_120919
 Collection Date: 09-Dec-2019 13:20

ANALYTICAL REPORT

WorkOrder:HS19120544
 Lab ID:HS19120544-07
 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	15-Dec-2019 17:04	
cis-1,2-Dichloroethene	22		0.20	0.50	1.0	UG/L	1	15-Dec-2019 17:04	
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	15-Dec-2019 17:04	
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 17:04	
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 17:04	
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 17:04	
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 17:04	
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	UG/L	1	15-Dec-2019 17:04	
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 17:04	
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	15-Dec-2019 17:04	
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	15-Dec-2019 17:04	
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Dec-2019 17:04	
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 17:04	
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 17:04	
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 17:04	
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 17:04	
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 17:04	
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 17:04	
Tetrachloroethene	1.5		0.30	0.50	1.0	UG/L	1	15-Dec-2019 17:04	
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 17:04	
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 17:04	
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 17:04	
Trichloroethene	970		5.0	12	25	UG/L	25	15-Dec-2019 19:04	
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 17:04	
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 17:04	
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>92.7</i>			0	<i>81-118</i>	%REC	1	15-Dec-2019 17:04	
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>90.9</i>			0	<i>81-118</i>	%REC	25	15-Dec-2019 19:04	
<i>Surr: 4-Bromofluorobenzene</i>	<i>101</i>			0	<i>85-114</i>	%REC	25	15-Dec-2019 19:04	
<i>Surr: 4-Bromofluorobenzene</i>	<i>99.8</i>			0	<i>85-114</i>	%REC	1	15-Dec-2019 17:04	
<i>Surr: Dibromofluoromethane</i>	<i>93.7</i>			0	<i>80-119</i>	%REC	1	15-Dec-2019 17:04	
<i>Surr: Dibromofluoromethane</i>	<i>92.4</i>			0	<i>80-119</i>	%REC	25	15-Dec-2019 19:04	
<i>Surr: Toluene-d8</i>	<i>103</i>			0	<i>89-112</i>	%REC	1	15-Dec-2019 17:04	
<i>Surr: Toluene-d8</i>	<i>101</i>			0	<i>89-112</i>	%REC	25	15-Dec-2019 19:04	
SEMIVOLATILES SIM		Method:SW8270SIM						Prep:SW3510 / 12-Dec-2019 Analyst: LG	
1,4-Dioxane	0.22		0.010	0.010	0.010	ug/L	1	20-Dec-2019 11:27	
<i>Surr: 2-Fluorobiphenyl</i>	<i>118</i>			0	<i>40-140</i>	%REC	1	20-Dec-2019 11:27	
<i>Surr: 4-Terphenyl-d14</i>	<i>101</i>			0	<i>40-140</i>	%REC	1	20-Dec-2019 11:27	
<i>Surr: Nitrobenzene-d5</i>	<i>90.1</i>			0	<i>40-140</i>	%REC	1	20-Dec-2019 11:27	

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

ALS Houston, US

Date: 23-Dec-19

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP 18 24
 Sample ID: 18CptMW14_120919
 Collection Date: 09-Dec-2019 13:20

ANALYTICAL REPORT
 WorkOrder:HS19120544
 Lab ID:HS19120544-07
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A			Method:SW6020			Prep:SW3010A / 13-Dec-2019		Analyst: JHD
Aluminum	0.125		0.00180	0.00500	0.0100	mg/L	1	17-Dec-2019 11:38
Antimony	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	17-Dec-2019 11:38
Arsenic	0.00169	J	0.000400	0.000500	0.00500	mg/L	1	17-Dec-2019 11:38
Barium	5.74		0.0380	0.0500	0.100	mg/L	20	17-Dec-2019 12:35
Beryllium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	17-Dec-2019 11:38
Cadmium	0.000245	J	0.000200	0.000500	0.00200	mg/L	1	17-Dec-2019 11:38
Calcium	486		0.680	1.00	10.0	mg/L	20	17-Dec-2019 12:35
Chromium	0.00510		0.000400	0.000500	0.00500	mg/L	1	17-Dec-2019 11:38
Cobalt	0.00966		0.000100	0.000500	0.00500	mg/L	1	17-Dec-2019 11:38
Copper	0.00250	U	0.00100	0.00250	0.00500	mg/L	1	17-Dec-2019 11:38
Iron	0.926		0.0120	0.0500	0.200	mg/L	1	17-Dec-2019 11:38
Lead	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	17-Dec-2019 11:38
Magnesium	130		0.0100	0.0500	0.200	mg/L	1	17-Dec-2019 11:38
Manganese	0.514		0.000700	0.00250	0.00500	mg/L	1	17-Dec-2019 11:38
Nickel	0.00637		0.000600	0.00100	0.00500	mg/L	1	17-Dec-2019 11:38
Potassium	15.6		0.0180	0.0500	0.200	mg/L	1	17-Dec-2019 11:38
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	17-Dec-2019 11:38
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	17-Dec-2019 11:38
Sodium	567		0.280	1.00	4.00	mg/L	20	17-Dec-2019 12:35
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	17-Dec-2019 11:38
Vanadium	0.000939	J	0.000600	0.00100	0.00500	mg/L	1	17-Dec-2019 11:38
Zinc	0.00617		0.00200	0.00250	0.00500	mg/L	1	17-Dec-2019 11:38
MERCURY BY SW7470A			Method:SW7470			Prep:SW7470 / 13-Dec-2019		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	13-Dec-2019 15:47
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)			Method:NA			Analyst: SUB		
Subcontract Analysis	See Attached		0	0		NA	1	23-Dec-2019 17:05

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

ALS Houston, US

Date: 23-Dec-19

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP 18 24
 Sample ID: Trip Blank CG-101419-15
 Collection Date: 09-Dec-2019 00:00

ANALYTICAL REPORT

WorkOrder:HS19120544
 Lab ID:HS19120544-08
 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD		Method:SW8260						
8260C								Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 15:28
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 15:28
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	15-Dec-2019 15:28
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 15:28
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 15:28
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 15:28
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 15:28
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Dec-2019 15:28
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	15-Dec-2019 15:28
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	15-Dec-2019 15:28
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 15:28
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 15:28
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 15:28
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	15-Dec-2019 15:28
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 15:28
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	15-Dec-2019 15:28
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 15:28
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Dec-2019 15:28
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 15:28
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Dec-2019 15:28
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 15:28
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	15-Dec-2019 15:28
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 15:28
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	15-Dec-2019 15:28
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Dec-2019 15:28
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 15:28
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	15-Dec-2019 15:28
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	15-Dec-2019 15:28
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 15:28
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Dec-2019 15:28
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 15:28
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 15:28
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	15-Dec-2019 15:28
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	15-Dec-2019 15:28
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	15-Dec-2019 15:28
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	15-Dec-2019 15:28
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 15:28
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 15:28
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 15:28

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

ALS Houston, US

Date: 23-Dec-19

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP 18 24
 Sample ID: Trip Blank CG-101419-15
 Collection Date: 09-Dec-2019 00:00

ANALYTICAL REPORT
 WorkOrder:HS19120544
 Lab ID:HS19120544-08
 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED	
VOLATILES ORGANICS BY METHOD 8260C		Method:SW8260							Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 15:28	
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 15:28	
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	15-Dec-2019 15:28	
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 15:28	
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 15:28	
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 15:28	
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 15:28	
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	UG/L	1	15-Dec-2019 15:28	
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 15:28	
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	15-Dec-2019 15:28	
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	15-Dec-2019 15:28	
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Dec-2019 15:28	
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 15:28	
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 15:28	
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 15:28	
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 15:28	
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 15:28	
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 15:28	
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 15:28	
Toluene	0.62	J	0.20	0.50	1.0	UG/L	1	15-Dec-2019 15:28	
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 15:28	
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 15:28	
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 15:28	
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 15:28	
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 15:28	
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>90.2</i>			0	<i>81-118</i>	%REC	1	<i>15-Dec-2019 15:28</i>	
<i>Surr: 4-Bromofluorobenzene</i>	<i>99.3</i>			0	<i>85-114</i>	%REC	1	<i>15-Dec-2019 15:28</i>	
<i>Surr: Dibromofluoromethane</i>	<i>93.3</i>			0	<i>80-119</i>	%REC	1	<i>15-Dec-2019 15:28</i>	
<i>Surr: Toluene-d8</i>	<i>103</i>			0	<i>89-112</i>	%REC	1	<i>15-Dec-2019 15:28</i>	

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

Weight / Prep Log

Client: Bhate Environmental Associates, Inc.

Project: LHAAP 18 24

WorkOrder: HS19120544

Batch ID: 148571	Start Date: 12 Dec 2019 09:39	End Date: 12 Dec 2019 12:30
Method: SV AQ SEP FUN EXTRACT-LOWLEV - 3510C	Prep Code: 3510_B_SIM	

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19120544-02	1	1000 (mL)	1 (mL)	0.001
HS19120544-03	1	1000 (mL)	1 (mL)	0.001
HS19120544-04	1	1000 (mL)	1 (mL)	0.001
HS19120544-05	1	1000 (mL)	1 (mL)	0.001
HS19120544-06	1	1000 (mL)	1 (mL)	0.001
HS19120544-07	1	1000 (mL)	1 (mL)	0.001

Batch ID: 148640	Start Date: 13 Dec 2019 11:30	End Date: 13 Dec 2019 15:30
Method: WATER - SW3010A	Prep Code: 3010A	

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19120544-01		10 (mL)	10 (mL)	1
HS19120544-04		10 (mL)	10 (mL)	1
HS19120544-07		10 (mL)	10 (mL)	1

Batch ID: 148663	Start Date: 13 Dec 2019 10:30	End Date: 13 Dec 2019 12:30
Method: MERCURY PREP BY 7470A- WATER	Prep Code: HG_WPR	

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19120544-01		10 (mL)	10 (mL)	1
HS19120544-04		10 (mL)	10 (mL)	1
HS19120544-07		10 (mL)	10 (mL)	1

ALS Houston, US

Date: 23-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19120544

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: 148571 (0)		Test Name : SEMIVOLATILES SIM			Matrix: Groundwater	
HS19120544-02	18WW10_120919	09 Dec 2019 09:05		12 Dec 2019 09:39	20 Dec 2019 09:52	1
HS19120544-03	18WW06_120919	09 Dec 2019 09:55		12 Dec 2019 09:39	20 Dec 2019 10:11	1
HS19120544-04	18WW02_120919	09 Dec 2019 10:45		12 Dec 2019 09:39	20 Dec 2019 10:30	1
HS19120544-05	MW16_120919	09 Dec 2019 11:40		12 Dec 2019 09:39	20 Dec 2019 11:46	100
HS19120544-06	18CptMW23_120919	09 Dec 2019 12:30		12 Dec 2019 09:39	20 Dec 2019 12:05	100
HS19120544-07	18CptMW14_120919	09 Dec 2019 13:20		12 Dec 2019 09:39	20 Dec 2019 11:27	1
Batch ID: 148640 (0)		Test Name : METALS BY ICPMS BY SW6020A			Matrix: Groundwater	
HS19120544-01	MW19_120919	09 Dec 2019 08:15		13 Dec 2019 14:30	17 Dec 2019 12:33	20
HS19120544-01	MW19_120919	09 Dec 2019 08:15		13 Dec 2019 14:30	17 Dec 2019 11:33	1
HS19120544-04	18WW02_120919	09 Dec 2019 10:45		13 Dec 2019 14:30	17 Dec 2019 11:36	1
HS19120544-07	18CptMW14_120919	09 Dec 2019 13:20		13 Dec 2019 14:30	17 Dec 2019 12:35	20
HS19120544-07	18CptMW14_120919	09 Dec 2019 13:20		13 Dec 2019 14:30	17 Dec 2019 11:38	1
Batch ID: 148663 (0)		Test Name : MERCURY BY SW7470A			Matrix: Groundwater	
HS19120544-01	MW19_120919	09 Dec 2019 08:15		13 Dec 2019 10:30	13 Dec 2019 15:44	1
HS19120544-04	18WW02_120919	09 Dec 2019 10:45		13 Dec 2019 10:30	13 Dec 2019 15:45	1
HS19120544-07	18CptMW14_120919	09 Dec 2019 13:20		13 Dec 2019 10:30	13 Dec 2019 15:47	1
Batch ID: R352551 (0)		Test Name : VOLATILES ORGANICS BY METHOD 8260C			Matrix: Water	
HS19120544-08	Trip Blank CG-101419-15	09 Dec 2019 00:00			15 Dec 2019 15:28	1
Batch ID: R352551 (0)		Test Name : VOLATILES ORGANICS BY METHOD 8260C			Matrix: Groundwater	
HS19120544-01	MW19_120919	09 Dec 2019 08:15			15 Dec 2019 20:17	1
HS19120544-02	18WW10_120919	09 Dec 2019 09:05			15 Dec 2019 20:41	1
HS19120544-03	18WW06_120919	09 Dec 2019 09:55			15 Dec 2019 21:05	1
HS19120544-04	18WW02_120919	09 Dec 2019 10:45			15 Dec 2019 21:29	1
HS19120544-05	MW16_120919	09 Dec 2019 11:40			15 Dec 2019 18:40	25
HS19120544-05	MW16_120919	09 Dec 2019 11:40			15 Dec 2019 16:16	1
HS19120544-06	18CptMW23_120919	09 Dec 2019 12:30			15 Dec 2019 19:28	100
HS19120544-06	18CptMW23_120919	09 Dec 2019 12:30			15 Dec 2019 17:28	10
HS19120544-07	18CptMW14_120919	09 Dec 2019 13:20			15 Dec 2019 19:04	25
HS19120544-07	18CptMW14_120919	09 Dec 2019 13:20			15 Dec 2019 17:04	1
Batch ID: R353152 (0)		Test Name : SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)			Matrix: Groundwater	
HS19120544-01	MW19_120919	09 Dec 2019 08:15			23 Dec 2019 17:05	1
HS19120544-02	18WW10_120919	09 Dec 2019 09:05			23 Dec 2019 17:05	1
HS19120544-03	18WW06_120919	09 Dec 2019 09:55			23 Dec 2019 17:05	1
HS19120544-04	18WW02_120919	09 Dec 2019 10:45			23 Dec 2019 17:05	1
HS19120544-05	MW16_120919	09 Dec 2019 11:40			23 Dec 2019 17:05	1
HS19120544-06	18CptMW23_120919	09 Dec 2019 12:30			23 Dec 2019 17:05	1
HS19120544-07	18CptMW14_120919	09 Dec 2019 13:20			23 Dec 2019 17:05	1

ALS Houston, US

Date: 23-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19120544

QC BATCH REPORT

Batch ID: 148640 (0)		Instrument: ICPMS05		Method: METALS BY ICPMS BY SW6020A						
MBLK	Sample ID: MBLK-148640	Units: mg/L			Analysis Date: 17-Dec-2019 10:51					
Client ID:	Run ID: ICPMS05_352677	SeqNo: 5394917	PrepDate: 13-Dec-2019	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.006538	0.0100								J
Antimony	0.000500	0.00500								U
Arsenic	0.000500	0.00500								U
Barium	0.00250	0.00500								U
Beryllium	0.000500	0.00200								U
Cadmium	0.000500	0.00200								U
Calcium	0.0500	0.500								U
Chromium	0.000500	0.00500								U
Cobalt	0.000500	0.00500								U
Copper	0.00250	0.00500								U
Iron	0.0500	0.200								U
Lead	0.00100	0.00500								U
Magnesium	0.0500	0.200								U
Manganese	0.00250	0.00500								U
Nickel	0.00100	0.00500								U
Potassium	0.0500	0.200								U
Selenium	0.00250	0.00500								U
Silver	0.000500	0.00500								U
Sodium	0.0500	0.200								U
Thallium	0.000500	0.00200								U
Vanadium	0.00100	0.00500								U
Zinc	0.00250	0.00500								U

ALS Houston, US

Date: 23-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19120544

QC BATCH REPORT

Batch ID: 148640 (0)		Instrument: ICPMS05		Method: METALS BY ICPMS BY SW6020A						
LCS	Sample ID: LCS-148640	Units: mg/L			Analysis Date: 17-Dec-2019 10:53					
Client ID:	Run ID: ICPMS05_352677	SeqNo: 5394918	PrepDate: 13-Dec-2019	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.0907	0.0100	0.1	0	90.7	84 - 117				
Antimony	0.04987	0.00500	0.05	0	99.7	85 - 117				
Arsenic	0.04935	0.00500	0.05	0	98.7	84 - 116				
Barium	0.04729	0.00500	0.05	0	94.6	86 - 114				
Beryllium	0.04943	0.00200	0.05	0	98.9	83 - 121				
Cadmium	0.04972	0.00200	0.05	0	99.4	87 - 115				
Calcium	5.076	0.500	5	0	102	87 - 118				
Chromium	0.0485	0.00500	0.05	0	97.0	85 - 116				
Cobalt	0.04964	0.00500	0.05	0	99.3	86 - 115				
Copper	0.04961	0.00500	0.05	0	99.2	85 - 118				
Iron	5.135	0.200	5	0	103	87 - 118				
Lead	0.04709	0.00500	0.05	0	94.2	88 - 115				
Magnesium	5.044	0.200	5	0	101	83 - 118				
Manganese	0.05016	0.00500	0.05	0	100	87 - 115				
Nickel	0.05126	0.00500	0.05	0	103	85 - 117				
Potassium	5.086	0.200	5	0	102	87 - 115				
Selenium	0.05047	0.00500	0.05	0	101	80 - 120				
Silver	0.04548	0.00500	0.05	0	91.0	85 - 116				
Sodium	5.056	0.200	5	0	101	85 - 117				
Thallium	0.0444	0.00200	0.05	0	88.8	82 - 116				
Vanadium	0.04849	0.00500	0.05	0	97.0	86 - 115				
Zinc	0.05151	0.00500	0.05	0	103	83 - 119				

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Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19120544

QC BATCH REPORT

Batch ID: 148640 (0)		Instrument: ICPMS05		Method: METALS BY ICPMS BY SW6020A						
MS	Sample ID: HS19120386-01MS	Units: mg/L			Analysis Date: 17-Dec-2019 11:20					
Client ID:	Run ID: ICPMS05_352677	SeqNo: 5394930	PrepDate: 13-Dec-2019	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.1153	0.0100	0.1	0.0378	77.5	84 - 117				S
Antimony	0.05003	0.00500	0.05	0.000146	99.8	85 - 117				
Arsenic	0.05042	0.00500	0.05	0.000792	99.3	84 - 116				
Barium	0.8194	0.00500	0.05	0.8153	8.21	86 - 114				SO
Beryllium	0.05303	0.00200	0.05	0.000006	106	83 - 121				
Cadmium	0.04769	0.00200	0.05	0.000159	95.1	87 - 115				
Calcium	67.27	0.500	5	63.27	80.0	87 - 118				SO
Chromium	0.05613	0.00500	0.05	0.007248	97.8	85 - 116				
Cobalt	0.05016	0.00500	0.05	0.002323	95.7	86 - 115				
Copper	0.04887	0.00500	0.05	0.00014	97.5	85 - 118				
Iron	5.731	0.200	5	0.776	99.1	87 - 118				
Lead	0.04884	0.00500	0.05	0.000053	97.6	88 - 115				
Magnesium	37.85	0.200	5	33.67	83.7	83 - 118				O
Manganese	0.4258	0.00500	0.05	0.3904	70.9	87 - 115				SO
Nickel	0.05467	0.00500	0.05	0.006239	96.9	85 - 117				
Potassium	44.94	0.200	5	41.28	73.2	87 - 115				SO
Selenium	0.05103	0.00500	0.05	0.000157	102	80 - 120				
Silver	0.04376	0.00500	0.05	0.000016	87.5	85 - 116				
Sodium	223.9	0.200	5	226.7	-55.8	85 - 117				SEO
Thallium	0.04494	0.00200	0.05	0.000097	89.7	82 - 116				
Vanadium	0.0499	0.00500	0.05	0.00057	98.7	86 - 115				
Zinc	0.06194	0.00500	0.05	0.01223	99.4	83 - 119				

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Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19120544

QC BATCH REPORT

Batch ID: 148640 (0)		Instrument: ICPMS05			Method: METALS BY ICPMS BY SW6020A					
MSD		Sample ID: HS19120386-01MSD			Units: mg/L		Analysis Date: 17-Dec-2019 11:22			
Client ID:		Run ID: ICPMS05_352677			SeqNo: 5394931		PrepDate: 13-Dec-2019		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.1041	0.0100	0.1	0.0378	66.3	84 - 117	0.1153	10.2	20	S
Antimony	0.04945	0.00500	0.05	0.000146	98.6	85 - 117	0.05003	1.18	20	
Arsenic	0.04915	0.00500	0.05	0.000792	96.7	84 - 116	0.05042	2.55	20	
Barium	0.8149	0.00500	0.05	0.8153	-0.786	86 - 114	0.8194	0.551	20	SO
Beryllium	0.05256	0.00200	0.05	0.000006	105	83 - 121	0.05303	0.89	20	
Cadmium	0.04763	0.00200	0.05	0.000159	94.9	87 - 115	0.04769	0.141	20	
Calcium	65.16	0.500	5	63.27	37.9	87 - 118	67.27	3.18	20	SO
Chromium	0.05411	0.00500	0.05	0.007248	93.7	85 - 116	0.05613	3.65	20	
Cobalt	0.04766	0.00500	0.05	0.002323	90.7	86 - 115	0.05016	5.13	20	
Copper	0.0468	0.00500	0.05	0.00014	93.3	85 - 118	0.04887	4.32	20	
Iron	5.493	0.200	5	0.776	94.3	87 - 118	5.731	4.25	20	
Lead	0.04838	0.00500	0.05	0.000053	96.7	88 - 115	0.04884	0.944	20	
Magnesium	37.06	0.200	5	33.67	67.9	83 - 118	37.85	2.11	20	SO
Manganese	0.4257	0.00500	0.05	0.3904	70.6	87 - 115	0.4258	0.0324	20	SO
Nickel	0.0518	0.00500	0.05	0.006239	91.1	85 - 117	0.05467	5.39	20	
Potassium	43.42	0.200	5	41.28	42.7	87 - 115	44.94	3.45	20	SO
Selenium	0.0485	0.00500	0.05	0.000157	96.7	80 - 120	0.05103	5.08	20	
Silver	0.04285	0.00500	0.05	0.000016	85.7	85 - 116	0.04376	2.12	20	
Sodium	219.4	0.200	5	226.7	-145	85 - 117	223.9	2.01	20	SEO
Thallium	0.04507	0.00200	0.05	0.000097	89.9	82 - 116	0.04494	0.276	20	
Vanadium	0.04897	0.00500	0.05	0.00057	96.8	86 - 115	0.0499	1.87	20	
Zinc	0.05908	0.00500	0.05	0.01223	93.7	83 - 119	0.06194	4.73	20	
PDS		Sample ID: HS19120386-01PDS			Units: mg/L		Analysis Date: 18-Dec-2019 15:37			
Client ID:		Run ID: ICPMS05_352780			SeqNo: 5402979		PrepDate: 13-Dec-2019		DF: 2	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.2096	0.0200	0.2	0.01455	97.5	80 - 120				

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Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19120544

QC BATCH REPORT

Batch ID: 148640 (0)		Instrument: ICPMS05			Method: METALS BY ICPMS BY SW6020A					
PDS		Sample ID: HS19120386-01PDS			Units: mg/L		Analysis Date: 17-Dec-2019 11:25			
Client ID:		Run ID: ICPMS05_352677			SeqNo: 5394932		PrepDate: 13-Dec-2019		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.08761	0.00500	0.1	0.000146	87.5	80 - 120				
Arsenic	0.08842	0.00500	0.1	0.000792	87.6	80 - 120				
Barium	0.8064	0.00500	0.1	0.8153	-8.94	80 - 120				SO
Beryllium	0.08793	0.00200	0.1	0.000006	87.9	80 - 120				
Cadmium	0.08769	0.00200	0.1	0.000159	87.5	80 - 120				
Calcium	62.35	0.500	10	63.27	-9.25	80 - 120				SO
Chromium	0.09194	0.00500	0.1	0.007248	84.7	80 - 120				
Cobalt	0.08431	0.00500	0.1	0.002323	82.0	80 - 120				
Copper	0.08561	0.00500	0.1	0.00014	85.5	80 - 120				
Iron	9.378	0.200	10	0.776	86.0	80 - 120				
Lead	0.08719	0.00500	0.1	0.000053	87.1	80 - 120				
Nickel	0.08831	0.00500	0.1	0.006239	82.1	80 - 120				
Potassium	44.25	0.200	10	41.28	29.7	80 - 120				SO
Selenium	0.09064	0.00500	0.1	0.000157	90.5	80 - 120				
Thallium	0.08435	0.00200	0.1	0.000097	84.3	80 - 120				
Vanadium	0.08755	0.00500	0.1	0.00057	87.0	80 - 120				
Zinc	0.1014	0.00500	0.1	0.01223	89.2	80 - 120				
PDS		Sample ID: HS19120386-01PDS			Units: mg/L		Analysis Date: 17-Dec-2019 12:31			
Client ID:		Run ID: ICPMS05_352677			SeqNo: 5395314		PrepDate: 13-Dec-2019		DF: 10	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Magnesium	123.2	2.00	100	35.18	88.0	80 - 120				
Manganese	1.257	0.0500	1	0.379	87.9	80 - 120				
Sodium	301	2.00	100	232.2	68.9	80 - 120				S
SD		Sample ID: HS19120386-01SD			Units: mg/L		Analysis Date: 18-Dec-2019 15:35			
Client ID:		Run ID: ICPMS05_352780			SeqNo: 5402978		PrepDate: 13-Dec-2019		DF: 10	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	RPD Limit	Qual
Aluminum	0.02229	0.100					0.01455	0	10	J

ALS Houston, US

Date: 23-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19120544

QC BATCH REPORT

Batch ID: 148640 (0)		Instrument: ICPMS05		Method: METALS BY ICPMS BY SW6020A						
SD	Sample ID: HS19120386-01SD	Units: mg/L			Analysis Date: 17-Dec-2019 11:18					
Client ID:	Run ID: ICPMS05_352677	SeqNo: 5394929		PrepDate: 13-Dec-2019		DF: 5				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit Qual	
Antimony	0.00250	0.0250					0.000146	0 10	U	
Arsenic	0.00250	0.0250					0.000792	0 10	U	
Barium	0.7833	0.0250					0.8153	3.93 10		
Beryllium	0.00250	0.0100					0.000006	0 10	U	
Cadmium	0.00250	0.0100					0.000159	0 10	U	
Calcium	62.77	2.50					63.27	0.791 10		
Chromium	0.008182	0.0250					0.007248	0 10	J	
Cobalt	0.002434	0.0250					0.002323	0 10	J	
Copper	0.0125	0.0250					0.00014	0 10	U	
Iron	0.7668	1.00					0.776	0 10	J	
Lead	0.00500	0.0250					0.000053	0 10	U	
Nickel	0.006499	0.0250					0.006239	0 10	J	
Potassium	43.81	1.00					41.28	6.14 10		
Selenium	0.0125	0.0250					0.000157	0 10	U	
Silver	0.00250	0.0250					0.000016	0 10	U	
Thallium	0.00250	0.0100					0.000097	0 10	U	
Vanadium	0.003811	0.0250					0.00057	0 10	J	
Zinc	0.01171	0.0250					0.01223	0 10	J	
SD	Sample ID: HS19120386-01SD	Units: mg/L			Analysis Date: 17-Dec-2019 12:28					
Client ID:	Run ID: ICPMS05_352677	SeqNo: 5395313		PrepDate: 13-Dec-2019		DF: 50				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit Qual	
Magnesium	34.34	10.0					35.18	2.39 10		
Manganese	0.395	0.250					0.379	4.23 10		
Sodium	234	10.0					232.2	0.796 10		
The following samples were analyzed in this batch: HS19120544-01 HS19120544-04 HS19120544-07										

ALS Houston, US

Date: 23-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19120544

QC BATCH REPORT

Batch ID: 148663 (0)		Instrument: HG03		Method: MERCURY BY SW7470A						
MBLK	Sample ID: MBLK-148663	Units: mg/L		Analysis Date: 13-Dec-2019 15:11						
Client ID:	Run ID: HG03_352483	SeqNo: 5389505		PrepDate: 13-Dec-2019		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual	
Mercury	0.000100	0.000200							U	
LCS	Sample ID: LCS-148663	Units: mg/L		Analysis Date: 13-Dec-2019 15:13						
Client ID:	Run ID: HG03_352483	SeqNo: 5389506		PrepDate: 13-Dec-2019		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual	
Mercury	0.00530	0.000200	0.005	0	106	80 - 120				
MS	Sample ID: HS19120553-03MS	Units: mg/L		Analysis Date: 13-Dec-2019 15:16						
Client ID:	Run ID: HG03_352483	SeqNo: 5389508		PrepDate: 13-Dec-2019		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual	
Mercury	0.00510	0.000200	0.005	-0.00001900	102	75 - 125				
MSD	Sample ID: HS19120553-03MSD	Units: mg/L		Analysis Date: 13-Dec-2019 15:18						
Client ID:	Run ID: HG03_352483	SeqNo: 5389509		PrepDate: 13-Dec-2019		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual	
Mercury	0.00513	0.000200	0.005	-0.00001900	103	75 - 125	0.005100	0.587	20	
The following samples were analyzed in this batch:										
HS19120544-01 HS19120544-04 HS19120544-07										

ALS Houston, US

Date: 23-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19120544

QC BATCH REPORT

Batch ID: 148571 (0)		Instrument: SV-6		Method: SEMIVOLATILES SIM						
MBLK	Sample ID: MBLK-148571	Units: ug/L			Analysis Date: 20-Dec-2019 07:56					
Client ID:	Run ID: SV-6_352996	SeqNo: 5402463		PrepDate: 12-Dec-2019		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,4-Dioxane	0.010	0.010								U
Surr: 2-Fluorobiphenyl	0.08845	0	0.08	0	111	40 - 140				
Surr: 4-Terphenyl-d14	0.06972	0	0.08	0	87.2	40 - 140				
Surr: Nitrobenzene-d5	0.07552	0	0.08	0	94.4	40 - 140				
LCS	Sample ID: LCS-148571	Units: ug/L			Analysis Date: 20-Dec-2019 08:16					
Client ID:	Run ID: SV-6_352996	SeqNo: 5402464		PrepDate: 12-Dec-2019		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,4-Dioxane	0.09506	0.010	0.08	0	119	40 - 140				
Surr: 2-Fluorobiphenyl	0.08857	0	0.08	0	111	40 - 140				
Surr: 4-Terphenyl-d14	0.07759	0	0.08	0	97.0	40 - 140				
Surr: Nitrobenzene-d5	0.08598	0	0.08	0	107	40 - 140				
LCSD	Sample ID: LCSD-148571	Units: ug/L			Analysis Date: 20-Dec-2019 08:36					
Client ID:	Run ID: SV-6_352996	SeqNo: 5402465		PrepDate: 12-Dec-2019		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,4-Dioxane	0.07033	0.010	0.08	0	87.9	40 - 140	0.09506	29.9	20	R
Surr: 2-Fluorobiphenyl	0.08451	0	0.08	0	106	40 - 140	0.08857	4.69	20	
Surr: 4-Terphenyl-d14	0.08034	0	0.08	0	100	40 - 140	0.07759	3.48	20	
Surr: Nitrobenzene-d5	0.07718	0	0.08	0	96.5	40 - 140	0.08598	10.8	20	
The following samples were analyzed in this batch:										
HS19120544-02		HS19120544-03		HS19120544-04		HS19120544-05				
HS19120544-06		HS19120544-07								

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Date: 23-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19120544

QC BATCH REPORT

Batch ID: R352551 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MBLK	Sample ID: VBLKW-191215	Units: UG/L			Analysis Date: 15-Dec-2019 14:40					
Client ID:	Run ID: VOA6_352551	SeqNo: 5391513	PrepDate:	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	0.50	1.0								U
1,1,1-Trichloroethane	0.50	1.0								U
1,1,2,2-Tetrachloroethane	0.50	1.0								U
1,1,2-Trichloroethane	0.50	1.0								U
1,1-Dichloroethane	0.50	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,1-Dichloropropene	0.50	1.0								U
1,2,3-Trichlorobenzene	0.50	1.0								U
1,2,3-Trichloropropane	0.50	1.0								U
1,2,4-Trichlorobenzene	0.50	1.0								U
1,2,4-Trimethylbenzene	0.50	1.0								U
1,2-Dibromo-3-chloropropane	0.50	1.0								U
1,2-Dibromoethane	0.50	1.0								U
1,2-Dichlorobenzene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
1,2-Dichloropropane	0.50	1.0								U
1,3,5-Trimethylbenzene	0.50	1.0								U
1,3-Dichlorobenzene	0.50	1.0								U
1,3-Dichloropropane	0.50	1.0								U
1,4-Dichlorobenzene	0.50	1.0								U
2,2-Dichloropropane	0.50	1.0								U
2-Butanone	1.0	2.0								U
2-Chlorotoluene	0.50	1.0								U
2-Hexanone	1.0	2.0								U
4-Chlorotoluene	0.50	1.0								U
4-Isopropyltoluene	0.50	1.0								U
4-Methyl-2-pentanone	1.0	2.0								U
Acetone	1.0	2.0								U
Benzene	0.50	1.0								U
Bromobenzene	0.50	1.0								U
Bromochloromethane	0.50	1.0								U
Bromodichloromethane	0.50	1.0								U
Bromoform	0.50	1.0								U
Bromomethane	0.50	1.0								U

ALS Houston, US

Date: 23-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19120544

QC BATCH REPORT

Batch ID: R352551 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MBLK	Sample ID: VBLKW-191215	Units: UG/L			Analysis Date: 15-Dec-2019 14:40					
Client ID:	Run ID: VOA6_352551	SeqNo: 5391513		PrepDate:		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	1.0	2.0								U
Carbon tetrachloride	0.50	1.0								U
Chlorobenzene	0.50	1.0								U
Chloroethane	0.50	1.0								U
Chloroform	0.50	1.0								U
Chloromethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
cis-1,3-Dichloropropene	0.50	1.0								U
Dibromochloromethane	0.50	1.0								U
Dibromomethane	0.50	1.0								U
Dichlorodifluoromethane	0.50	1.0								U
Ethylbenzene	0.50	1.0								U
Hexachlorobutadiene	0.50	1.0								U
Isopropylbenzene	0.50	1.0								U
m,p-Xylene	1.0	2.0								U
Methylene chloride	1.0	2.0								U
Naphthalene	0.50	1.0								U
n-Butylbenzene	0.50	1.0								U
n-Propylbenzene	0.50	1.0								U
o-Xylene	0.50	1.0								U
sec-Butylbenzene	0.50	1.0								U
Styrene	0.50	1.0								U
tert-Butylbenzene	0.50	1.0								U
Tetrachloroethene	0.50	1.0								U
Toluene	0.50	1.0								U
trans-1,2-Dichloroethene	0.50	1.0								U
trans-1,3-Dichloropropene	0.50	1.0								U
Trichloroethene	0.50	1.0								U
Trichlorofluoromethane	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>45.21</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>90.4</i>	<i>81 - 118</i>				
<i>Surr: 4-Bromofluorobenzene</i>	<i>49.93</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>99.9</i>	<i>85 - 114</i>				
<i>Surr: Dibromofluoromethane</i>	<i>46.64</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>93.3</i>	<i>80 - 119</i>				
<i>Surr: Toluene-d8</i>	<i>51.05</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>102</i>	<i>89 - 112</i>				

ALS Houston, US

Date: 23-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19120544

QC BATCH REPORT

Batch ID: R352551 (0)		Instrument: VOA6			Method: VOLATILES ORGANICS BY METHOD 8260C					
LCS	Sample ID: VLCSW-191215	Units: UG/L			Analysis Date: 15-Dec-2019 13:52					
Client ID:	Run ID: VOA6_352551	SeqNo: 5391512		PrepDate:		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	21.23	1.0	20	0	106	78 - 124				
1,1,1-Trichloroethane	21.44	1.0	20	0	107	74 - 131				
1,1,2,2-Tetrachloroethane	22.34	1.0	20	0	112	71 - 121				
1,1,2-Trichloroethane	21.28	1.0	20	0	106	80 - 119				
1,1-Dichloroethane	23.07	1.0	20	0	115	77 - 125				
1,1-Dichloroethene	18.02	1.0	20	0	90.1	71 - 131				
1,1-Dichloropropene	21.29	1.0	20	0	106	78 - 125				
1,2,3-Trichlorobenzene	30.81	1.0	20	0	154	69 - 129				S
1,2,3-Trichloropropane	22.41	1.0	20	0	112	73 - 122				
1,2,4-Trichlorobenzene	26.33	1.0	20	0	132	69 - 130				S
1,2,4-Trimethylbenzene	21.99	1.0	20	0	110	76 - 124				
1,2-Dibromo-3-chloropropane	22.84	1.0	20	0	114	62 - 128				
1,2-Dibromoethane	21.03	1.0	20	0	105	77 - 121				
1,2-Dichlorobenzene	21.09	1.0	20	0	105	80 - 119				
1,2-Dichloroethane	20.96	1.0	20	0	105	73 - 128				
1,2-Dichloropropane	21.82	1.0	20	0	109	78 - 122				
1,3,5-Trimethylbenzene	22.44	1.0	20	0	112	75 - 124				
1,3-Dichlorobenzene	21.7	1.0	20	0	109	80 - 119				
1,3-Dichloropropane	21.52	1.0	20	0	108	80 - 119				
1,4-Dichlorobenzene	21.2	1.0	20	0	106	79 - 118				
2,2-Dichloropropane	21.59	1.0	20	0	108	60 - 139				
2-Butanone	45.2	2.0	40	0	113	56 - 143				
2-Chlorotoluene	23.31	1.0	20	0	117	79 - 122				
2-Hexanone	41.53	2.0	40	0	104	57 - 139				
4-Chlorotoluene	22.47	1.0	20	0	112	78 - 122				
4-Isopropyltoluene	21.68	1.0	20	0	108	77 - 127				
4-Methyl-2-pentanone	42.83	2.0	40	0	107	67 - 130				
Acetone	34.88	2.0	40	0	87.2	39 - 160				
Benzene	22.88	1.0	20	0	114	79 - 120				
Bromobenzene	22.42	1.0	20	0	112	80 - 120				
Bromochloromethane	22.07	1.0	20	0	110	78 - 123				
Bromodichloromethane	21.39	1.0	20	0	107	79 - 125				
Bromoform	20.5	1.0	20	0	102	66 - 130				
Bromomethane	18.26	1.0	20	0	91.3	53 - 141				

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Date: 23-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19120544

QC BATCH REPORT

Batch ID: R352551 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
LCS	Sample ID: VLCSW-191215	Units: UG/L			Analysis Date: 15-Dec-2019 13:52					
Client ID:	Run ID: VOA6_352551	SeqNo: 5391512		PrepDate:		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	49.13	2.0	40	0	123	64 - 133				
Carbon tetrachloride	20.23	1.0	20	0	101	72 - 136				
Chlorobenzene	21.13	1.0	20	0	106	82 - 118				
Chloroethane	18.57	1.0	20	0	92.9	60 - 138				
Chloroform	20.78	1.0	20	0	104	79 - 124				
Chloromethane	18.28	1.0	20	0	91.4	50 - 139				
cis-1,2-Dichloroethene	23.16	1.0	20	0	116	78 - 123				
cis-1,3-Dichloropropene	22.33	1.0	20	0	112	75 - 124				
Dibromochloromethane	21.11	1.0	20	0	106	74 - 126				
Dibromomethane	20.95	1.0	20	0	105	79 - 123				
Dichlorodifluoromethane	22.29	1.0	20	0	111	32 - 152				
Ethylbenzene	21.05	1.0	20	0	105	79 - 121				
Hexachlorobutadiene	25.86	1.0	20	0	129	66 - 134				
Isopropylbenzene	20.87	1.0	20	0	104	72 - 131				
m,p-Xylene	42.95	2.0	40	0	107	80 - 121				
Methylene chloride	21.77	2.0	20	0	109	74 - 124				
Naphthalene	24.8	1.0	20	0	124	61 - 128				
n-Butylbenzene	21.45	1.0	20	0	107	75 - 128				
n-Propylbenzene	22.46	1.0	20	0	112	76 - 126				
o-Xylene	21.2	1.0	20	0	106	78 - 122				
sec-Butylbenzene	21.9	1.0	20	0	110	77 - 126				
Styrene	21.23	1.0	20	0	106	78 - 123				
tert-Butylbenzene	21.9	1.0	20	0	110	78 - 124				
Tetrachloroethene	20.12	1.0	20	0	101	74 - 129				
Toluene	21.78	1.0	20	0	109	80 - 121				
trans-1,2-Dichloroethene	22.73	1.0	20	0	114	75 - 124				
trans-1,3-Dichloropropene	21.65	1.0	20	0	108	73 - 127				
Trichloroethene	21.95	1.0	20	0	110	79 - 123				
Trichlorofluoromethane	17.48	1.0	20	0	87.4	65 - 141				
Vinyl chloride	18.95	1.0	20	0	94.8	58 - 137				
Surr: 1,2-Dichloroethane-d4	49.52	1.0	50	0	99.0	81 - 118				
Surr: 4-Bromofluorobenzene	49.42	1.0	50	0	98.8	85 - 114				
Surr: Dibromofluoromethane	49.06	1.0	50	0	98.1	80 - 119				
Surr: Toluene-d8	46.68	1.0	50	0	93.4	89 - 112				

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Date: 23-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19120544

QC BATCH REPORT

Batch ID: R352551 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MS	Sample ID: HS19120678-01MS	Units: UG/L			Analysis Date: 15-Dec-2019 17:52					
Client ID:	Run ID: VOA6_352551	SeqNo: 5391520	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	19.83	1.0	20	0	99.1	78 - 124				
1,1,1-Trichloroethane	18.56	1.0	20	0	92.8	74 - 131				
1,1,2,2-Tetrachloroethane	20.19	1.0	20	0	101	71 - 121				
1,1,2-Trichloroethane	19.42	1.0	20	0	97.1	80 - 119				
1,1-Dichloroethane	19.27	1.0	20	0	96.3	77 - 125				
1,1-Dichloroethene	14.21	1.0	20	0	71.0	71 - 131				
1,1-Dichloropropene	19.43	1.0	20	0	97.2	78 - 125				
1,2,3-Trichlorobenzene	20.18	1.0	20	0	101	69 - 129				
1,2,3-Trichloropropane	19.74	1.0	20	0	98.7	73 - 122				
1,2,4-Trichlorobenzene	19.77	1.0	20	0	98.8	69 - 130				
1,2,4-Trimethylbenzene	21.89	1.0	20	0	109	76 - 124				
1,2-Dibromo-3-chloropropane	18.21	1.0	20	0	91.0	62 - 128				
1,2-Dibromoethane	18.66	1.0	20	0	93.3	77 - 121				
1,2-Dichlorobenzene	19.75	1.0	20	0	98.7	80 - 119				
1,2-Dichloroethane	18.75	1.0	20	1.252	87.5	73 - 128				
1,2-Dichloropropane	19.17	1.0	20	0	95.9	78 - 122				
1,3,5-Trimethylbenzene	22.44	1.0	20	0	112	75 - 124				
1,3-Dichlorobenzene	21.01	1.0	20	0	105	80 - 119				
1,3-Dichloropropane	19.54	1.0	20	0	97.7	80 - 119				
1,4-Dichlorobenzene	20.3	1.0	20	0	102	79 - 118				
2,2-Dichloropropane	17.84	1.0	20	0	89.2	60 - 139				
2-Butanone	33.01	2.0	40	0	82.5	56 - 143				
2-Chlorotoluene	23.18	1.0	20	0	116	79 - 122				
2-Hexanone	34.55	2.0	40	0	86.4	57 - 139				
4-Chlorotoluene	21.88	1.0	20	0	109	78 - 122				
4-Isopropyltoluene	21.97	1.0	20	0	110	77 - 127				
4-Methyl-2-pentanone	36.61	2.0	40	0	91.5	67 - 130				
Acetone	21.74	2.0	40	0	54.4	39 - 160				
Benzene	20.1	1.0	20	0	101	79 - 120				
Bromobenzene	21.27	1.0	20	0	106	80 - 120				
Bromochloromethane	17.57	1.0	20	0	87.9	78 - 123				
Bromodichloromethane	18.42	1.0	20	0	92.1	79 - 125				
Bromoform	18.04	1.0	20	0	90.2	66 - 130				
Bromomethane	10.51	1.0	20	0	52.5	53 - 141				S

ALS Houston, US

Date: 23-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19120544

QC BATCH REPORT

Batch ID: R352551 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MS	Sample ID: HS19120678-01MS	Units: UG/L			Analysis Date: 15-Dec-2019 17:52					
Client ID:	Run ID: VOA6_352551	SeqNo: 5391520	PrepDate:	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	33.41	2.0	40	0	83.5	64 - 133				
Carbon tetrachloride	18.66	1.0	20	0	93.3	72 - 136				
Chlorobenzene	19.63	1.0	20	0	98.1	82 - 118				
Chloroethane	11.78	1.0	20	0	58.9	60 - 138				S
Chloroform	17.59	1.0	20	0	87.9	79 - 124				
Chloromethane	5.655	1.0	20	0	28.3	50 - 139				S
cis-1,2-Dichloroethene	56.78	1.0	20	37.62	95.8	78 - 123				
cis-1,3-Dichloropropene	19.14	1.0	20	0	95.7	75 - 124				
Dibromochloromethane	18.96	1.0	20	0	94.8	74 - 126				
Dibromomethane	17.85	1.0	20	0	89.3	79 - 123				
Dichlorodifluoromethane	2.723	1.0	20	0	13.6	32 - 152				S
Ethylbenzene	20.48	1.0	20	0	102	79 - 121				
Hexachlorobutadiene	21.83	1.0	20	0	109	66 - 134				
Isopropylbenzene	20.51	1.0	20	0	103	72 - 131				
m,p-Xylene	40.79	2.0	40	0	102	80 - 121				
Methylene chloride	19.4	2.0	20	1.926	87.4	74 - 124				
Naphthalene	17.48	1.0	20	0	87.4	61 - 128				
n-Butylbenzene	21.32	1.0	20	0	107	75 - 128				
n-Propylbenzene	22.7	1.0	20	0	113	76 - 126				
o-Xylene	19.81	1.0	20	0	99.0	78 - 122				
sec-Butylbenzene	22.27	1.0	20	0	111	77 - 126				
Styrene	19.69	1.0	20	0	98.4	78 - 123				
tert-Butylbenzene	22.7	1.0	20	0	114	78 - 124				
Tetrachloroethene	19.6	1.0	20	0	98.0	74 - 129				
Toluene	20.73	1.0	20	0	104	80 - 121				
trans-1,2-Dichloroethene	18.8	1.0	20	0	94.0	75 - 124				
trans-1,3-Dichloropropene	18.22	1.0	20	0	91.1	73 - 127				
Trichloroethene	27.41	1.0	20	6.751	103	79 - 123				
Trichlorofluoromethane	12.65	1.0	20	0	63.3	65 - 141				S
Vinyl chloride	9.004	1.0	20	0.493	42.6	58 - 137				S
Surr: 1,2-Dichloroethane-d4	45.04	1.0	50	0	90.1	81 - 118				
Surr: 4-Bromofluorobenzene	49.88	1.0	50	0	99.8	85 - 114				
Surr: Dibromofluoromethane	46.67	1.0	50	0	93.3	80 - 119				
Surr: Toluene-d8	50.66	1.0	50	0	101	89 - 112				

ALS Houston, US

Date: 23-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19120544

QC BATCH REPORT

Batch ID: R352551 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MSD	Sample ID: HS19120678-01MSD	Units: UG/L			Analysis Date: 15-Dec-2019 18:16					
Client ID:	Run ID: VOA6_352551	SeqNo: 5391521	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	19.19	1.0	20	0	96.0	78 - 124	19.83	3.25	20	
1,1,1-Trichloroethane	17.61	1.0	20	0	88.1	74 - 131	18.56	5.25	20	
1,1,2,2-Tetrachloroethane	20.08	1.0	20	0	100	71 - 121	20.19	0.524	20	
1,1,2-Trichloroethane	19.18	1.0	20	0	95.9	80 - 119	19.42	1.24	20	
1,1-Dichloroethane	18.52	1.0	20	0	92.6	77 - 125	19.27	3.93	20	
1,1-Dichloroethene	13.7	1.0	20	0	68.5	71 - 131	14.21	3.64	20	S
1,1-Dichloropropene	18.5	1.0	20	0	92.5	78 - 125	19.43	4.91	20	
1,2,3-Trichlorobenzene	21.11	1.0	20	0	106	69 - 129	20.18	4.52	20	
1,2,3-Trichloropropane	19.96	1.0	20	0	99.8	73 - 122	19.74	1.09	20	
1,2,4-Trichlorobenzene	20.11	1.0	20	0	101	69 - 130	19.77	1.69	20	
1,2,4-Trimethylbenzene	21.09	1.0	20	0	105	76 - 124	21.89	3.73	20	
1,2-Dibromo-3-chloropropane	17.8	1.0	20	0	89.0	62 - 128	18.21	2.25	20	
1,2-Dibromoethane	18.39	1.0	20	0	91.9	77 - 121	18.66	1.48	20	
1,2-Dichlorobenzene	19.61	1.0	20	0	98.1	80 - 119	19.75	0.7	20	
1,2-Dichloroethane	18.36	1.0	20	1.252	85.5	73 - 128	18.75	2.12	20	
1,2-Dichloropropane	18.82	1.0	20	0	94.1	78 - 122	19.17	1.85	20	
1,3,5-Trimethylbenzene	21.9	1.0	20	0	110	75 - 124	22.44	2.42	20	
1,3-Dichlorobenzene	20.23	1.0	20	0	101	80 - 119	21.01	3.74	20	
1,3-Dichloropropane	19.23	1.0	20	0	96.1	80 - 119	19.54	1.6	20	
1,4-Dichlorobenzene	19.86	1.0	20	0	99.3	79 - 118	20.3	2.22	20	
2,2-Dichloropropane	16.83	1.0	20	0	84.1	60 - 139	17.84	5.83	20	
2-Butanone	32.75	2.0	40	0	81.9	56 - 143	33.01	0.778	20	
2-Chlorotoluene	22.28	1.0	20	0	111	79 - 122	23.18	3.99	20	
2-Hexanone	34.24	2.0	40	0	85.6	57 - 139	34.55	0.895	20	
4-Chlorotoluene	21.16	1.0	20	0	106	78 - 122	21.88	3.34	20	
4-Isopropyltoluene	21.11	1.0	20	0	106	77 - 127	21.97	3.98	20	
4-Methyl-2-pentanone	36.05	2.0	40	0	90.1	67 - 130	36.61	1.55	20	
Acetone	21.28	2.0	40	0	53.2	39 - 160	21.74	2.14	20	
Benzene	19.17	1.0	20	0	95.9	79 - 120	20.1	4.75	20	
Bromobenzene	20.68	1.0	20	0	103	80 - 120	21.27	2.83	20	
Bromochloromethane	17.4	1.0	20	0	87.0	78 - 123	17.57	1.01	20	
Bromodichloromethane	18.07	1.0	20	0	90.3	79 - 125	18.42	1.93	20	
Bromoform	17.69	1.0	20	0	88.4	66 - 130	18.04	1.97	20	
Bromomethane	9.339	1.0	20	0	46.7	53 - 141	10.51	11.8	20	S

ALS Houston, US

Date: 23-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19120544

QC BATCH REPORT

Batch ID: R352551 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MSD	Sample ID: HS19120678-01MSD	Units: UG/L			Analysis Date: 15-Dec-2019 18:16					
Client ID:	Run ID: VOA6_352551	SeqNo: 5391521	PrepDate:	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	31.55	2.0	40	0	78.9	64 - 133	33.41	5.71	20	
Carbon tetrachloride	17.75	1.0	20	0	88.7	72 - 136	18.66	5.02	20	
Chlorobenzene	18.88	1.0	20	0	94.4	82 - 118	19.63	3.87	20	
Chloroethane	10.94	1.0	20	0	54.7	60 - 138	11.78	7.45	20	S
Chloroform	16.98	1.0	20	0	84.9	79 - 124	17.59	3.51	20	
Chloromethane	5.384	1.0	20	0	26.9	50 - 139	5.655	4.9	20	S
cis-1,2-Dichloroethene	55.13	1.0	20	37.62	87.5	78 - 123	56.78	2.95	20	
cis-1,3-Dichloropropene	18.75	1.0	20	0	93.8	75 - 124	19.14	2.06	20	
Dibromochloromethane	18.8	1.0	20	0	94.0	74 - 126	18.96	0.85	20	
Dibromomethane	17.7	1.0	20	0	88.5	79 - 123	17.85	0.864	20	
Dichlorodifluoromethane	2.615	1.0	20	0	13.1	32 - 152	2.723	4.03	20	S
Ethylbenzene	19.7	1.0	20	0	98.5	79 - 121	20.48	3.85	20	
Hexachlorobutadiene	21.07	1.0	20	0	105	66 - 134	21.83	3.54	20	
Isopropylbenzene	19.71	1.0	20	0	98.5	72 - 131	20.51	3.97	20	
m,p-Xylene	39.36	2.0	40	0	98.4	80 - 121	40.79	3.57	20	
Methylene chloride	18.67	2.0	20	1.926	83.7	74 - 124	19.4	3.83	20	
Naphthalene	18.12	1.0	20	0	90.6	61 - 128	17.48	3.59	20	
n-Butylbenzene	20.87	1.0	20	0	104	75 - 128	21.32	2.11	20	
n-Propylbenzene	21.92	1.0	20	0	110	76 - 126	22.7	3.46	20	
o-Xylene	19.49	1.0	20	0	97.5	78 - 122	19.81	1.6	20	
sec-Butylbenzene	21.51	1.0	20	0	108	77 - 126	22.27	3.5	20	
Styrene	19.2	1.0	20	0	96.0	78 - 123	19.69	2.52	20	
tert-Butylbenzene	21.65	1.0	20	0	108	78 - 124	22.7	4.73	20	
Tetrachloroethene	18.81	1.0	20	0	94.1	74 - 129	19.6	4.09	20	
Toluene	19.84	1.0	20	0	99.2	80 - 121	20.73	4.38	20	
trans-1,2-Dichloroethene	17.98	1.0	20	0	89.9	75 - 124	18.8	4.49	20	
trans-1,3-Dichloropropene	17.77	1.0	20	0	88.8	73 - 127	18.22	2.52	20	
Trichloroethene	25.67	1.0	20	6.751	94.6	79 - 123	27.41	6.54	20	
Trichlorofluoromethane	11.99	1.0	20	0	59.9	65 - 141	12.65	5.39	20	S
Vinyl chloride	8.359	1.0	20	0.493	39.3	58 - 137	9.004	7.43	20	S
Surr: 1,2-Dichloroethane-d4	45.73	1.0	50	0	91.5	81 - 118	45.04	1.51	20	
Surr: 4-Bromofluorobenzene	49.33	1.0	50	0	98.7	85 - 114	49.88	1.12	20	
Surr: Dibromofluoromethane	47.07	1.0	50	0	94.1	80 - 119	46.67	0.862	20	
Surr: Toluene-d8	50.93	1.0	50	0	102	89 - 112	50.66	0.541	20	

ALS Houston, US

Date: 23-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19120544

QC BATCH REPORT

Batch ID: R352551 (0)	Instrument: VOA6	Method: VOLATILES ORGANICS BY METHOD 8260C		
The following samples were analyzed in this batch:				
HS19120544-01	HS19120544-02	HS19120544-03	HS19120544-04	
HS19120544-05	HS19120544-06	HS19120544-07	HS19120544-08	

ALS Houston, US

Date: 23-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19120544

**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 Quantitation 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	19-028-0	27-Mar-2020
California	2919, 2019-2020	30-Apr-2020
Dept of Defense	ANAB L2231	20-Dec-2021
Florida	E87611-28	30-Jun-2020
Illinois	2000322019-2	09-May-2020
Kansas	E-10352 2019-2020	31-Jul-2020
Kentucky	123043, 2019-2020	30-Apr-2020
Louisiana	03087, 2019-2020	30-Jun-2020
Maryland	343, 2019-2020	30-Jun-2020
North Carolina	624-2019	31-Dec-2019
North Dakota	R-193 2019-2020	30-Apr-2020
Oklahoma	2019-067	31-Aug-2020
Texas	TX104704231-19-23	30-Apr-2020

Sample Receipt Checklist

Client Name: Bhate Environmental
 Work Order: HS19120544

Date/Time Received: **10-Dec-2019 09:15**
 Received by: **PMG**

Checklist completed by: RJ Modashia 12-Dec-2019
 eSignature Date

Reviewed by: RJ Modashia 12-Dec-2019
 eSignature Date

Matrices:

Carrier name: **FedEx**

- 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
- 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 IR11
 Cooler(s)/Kit(s): 45579
 Date/Time sample(s) sent to storage:

- 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:



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.: <u>LHAAP</u>							Sample Analysis Requested ⁽⁶⁾										Quality Assurance Samples ⁽⁶⁾							
Project/Site Name: <u>LHAAP / Site 18/24</u>							Number of containers	VOC	PERCHLORATE	TOTAL METALS	1, 4 - DIOXANE										Ambient Blank Lot Control Number	Equipment Blank Lot Control Number	Trip Blank Lot Control Number	Cooler ID
Client Name:																								
Collected by: <u>Scott Beesinger</u>																								
Field Sample ID (30 Characters Max)	Date Collected (dd-mm-yyyy)	Time Collected (Military) (hhmm)	Sample Depth (beginning - ending)	SA Code (2)	Sample Number (3)	Sample Matrix (4)																		
MW19-120919	09 Dec 2019	0815	-	N		WG	5	X	X	X														
18WW10-120919	09 Dec 2019	0905	-	N		WG	5	X	X	X														
18WW06-120919	09 Dec 2019	0955	-	N		WG	5	X	X	X														
18WW02-120919	09 Dec 2019	1045	-	N		WG	6	X	X	X	X													
MW16-120919	09 Dec 2019	1140	-	N		WG	5	X	X	X														
18PTMW23-120919	09 Dec 2019	1230	-	N		WG	5	X	X	X														
18CPTMW14-120919	09 Dec 2019	1320	-	N		WG	6	X	X	X	X													
TRIP BLANK	09 Dec 2019		-	TB		W	2	X																

HS19120544
 Bhate Environmental Associates, Inc.
 LHAAP 18 24




COMMENTS: _____

Relinquished By (Signed) _____ Date _____ Time _____ 1. <u>Scott Beesinger</u> 12/9/19 1430 2. _____ 3. _____			Custody Transfers Prior to Receipt by Laboratory Received by (signed) _____ Date _____ Time _____ 1. <u>[Signature]</u> 12/10/19 09:15 2. _____ 3. _____			Sample Delivery Details / Laboratory Receipt Delivered Directly to Lab: _____ Shipped _____ No.: _____ Method of Shipment: _____ Fed _____ Ex _____ Airbill _____ Number: _____ Analytical Lab: <u>ALS 10450 Stancliff Rd. Suite 210 Houston, TX 77099 (281) 530-5656</u> ATTN: SONIA WEST Lab Recipient: _____ Delivery Date/Time: _____		
--	--	--	--	--	--	--	--	--

1.) Chain of Custody Number = date collected + custody number (e.g. 09-02-1999-01)
 2.) Sample Type (SA) Codes: N = Normal Sample, TB = Trip Blank (-c) Sample, FD = Field Duplicate (-a) Samples, FR = Field Replicate (-b) Samples, EB = Equipment Blank (-d) Samples, MS = Matrix Spike, SD = Matrix Spike Duplicate, AB = Ambient Blank (-e)
 3.) Sample Number: Unique sample number collected from a particular location per day. (e.g. Groundwater sample collected from MW-1 on 10/10/99 = 01, if sampled again on 10/10/99 = 02, etc.)
 4.) Matrix Codes: GS = Soil Gas, WG = Groundwater, WS = Surface Water, SO = Soil, SE = Sediment, SL = Sludge, SS = Surface Soil Samples, WQ = Aqueous Blank Samples (trip, equipment, ambient, etc), SQ = Soil Blanks
 5.) Sample Analysis Requested: Analytical method requested and number of containers provided for each.
 6.) Quality assurance samples are assigned by date (ddmmyy) and the sample number associated with the sample (01, 02, etc) (e.g. Equipment blank collected in association with MW-1 on 10/10/99 will be designated 10109901 in the Equipment Blank Lot Control

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 # 11
 cfr-0.0"

 ALS 10450 Stancliff Rd., Suite 210 Houston, Texas 77099 Tel. +1 281 530 5656 Fax. +1 281 530 5887	CUSTODY SEAL		Seal Broken By: <i>SM</i>
	Date: <i>12/9/19</i>	Time: <i>1430</i>	Date:
	Name: <i>SCOTT BEESINER</i>		Date: <i>12/10/19</i>
		Company: <i>BHATE</i>	

45579 DEC 10 2019



Must Deliver Next Business Day
Time and Temperature Sensitive!

45579

Part #: 153488-434 RIT EXP 0720 **

ORIGIN ID:SGRA (903) 930-6193
SCOTT BEESINER
BHATE ENVIRONMENTAL ASSOCIATES
1203-B EAST GRAND AVE. PMB202
MARSHALL, TX 75670
UNITED STATES US

SHIP DATE: 02DEC19
ACTWTG: 1.00 LB MAIN
CAD: 300130/CAFE3211
DIMS: 26x14x14 IN

TO **CLIENT SERVICES**
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON TX 77099

(201) 530-5656
REF: LHAAP-18/24-BO 68900-RJ



FedEx
TRK# 1251 0292 4254
0221

TUE - 10 DEC 10:30A
PRIORITY OVERNIGHT

AB SGRA

77099
TX-US
IAH



FID 5898257 09DEC19 G6GA 56AC2/18DD/05A2



Case Narrative

Method: 6850
Analysis: Perchlorate
Analysis SOP: LC-MS-CLO4
ALS WO ID(s): 1934851; 1935316; 1935343

Client: ALS Laboratories (Houston, TX)
Matrix: Water
ELMS Batch (HBN): 2330 (254116)

General Set Information: There were seventeen field samples in these Work Orders. The samples were analyzed for perchlorate.

Method Summary: Each sample was prepared as noted below and analyzed using an Agilent 1100 LC/MSD system in select ion monitoring (SIM) mode at m/z 83 and 85, which corresponds to the loss of one oxygen atom from the perchlorate molecule. ChemStation software was used for instrument control and data analysis. The ion ratio of m/z 83 to 85 was used to positively identify the response peak as perchlorate. Quantitation was performed using the m/z 83 peak area. An internal standard (ISTD) of ¹⁸O labeled perchlorate was added to each sample to establish the perchlorate peak retention time and used in quantitation.

Sample Preparation: A 10.0mL aliquot of each sample was transferred into a 15-mL centrifuge tube. 50μL of an ¹⁸O labeled perchlorate solution was added to each sample as an internal standard. The samples were then capped, vortexed, and filtered into autosampler vial using Phenex PES membrane 0.45μm Syringe filters.

Holding Times: Holding times were met for all analyses.

Dilutions: Field sample 1934851007 was analyzed and reported from a 1:100 dilution. Field sample 1935343005 was analyzed and reported from a 1:10 dilution. Field samples 1935343004/06 were analyzed and reported from 1:1,000 dilutions. The reporting limits have been adjusted accordingly.

Method QC data: The method blank (LMB 689411) was less than 1/2 the CRDL. The recovery for the LCS (689408) was within acceptable parameters.



MS/MSD Analysis: MS/MSD was performed on sample 1934851001 (Client ID: MW19_120919). 3.0 μ L of Working Standard Solution Horizon ID 49947 was added to 10.0mL of sample preparation. The spike target was 3. μ g/L. The MS/MSD percent recoveries and relative percent difference (RPD) were within the performance limits.

Instrument QC: Instrument initial and continuing calibrations were performed in accordance with published procedures.

NC/CAR(s): NA

Sample Calculation: Samples were reported in μ g/L. Results were calculated in μ g/L by the equation (A)x(B),

where: A = Analyte concentration from the standard curve (μ g/L)

B = Dilution performed at time of analysis

Miscellaneous Comments: These samples were analyzed in accordance with the requirements found in the DOD QSM Version 5.1.1. The Reporting Limit Verification Standard (RLVS – 689409) is reported from the analysis of the Laboratory Control Sample (LCS – 689408) at a level of 3.0 μ g/L. Due to limitations of the Chemstation Software, some of the chromatographic peaks may require manual integrations. A manual integration was performed for one of the Initial Calibration analyses (datafile: 20SEPI03) along with datafiles 20DEC19D14/16/18/19.

Thomas Bosch December 23, 2019
Analyst Date



ANALYTICAL REPORT

Report Date: December 23, 2019

RJ Modashia
ALS Environmental (Houston)
10450 Stancliff Road
Suite 210
Houston, TX 77099

Phone: 281 530-5656

E-mail: RJ.Modashia@ALSGlobal.com

Workorder: **34-1934851**

Project ID: HS19120544

Purchase Order: HS19120544

Project Manager Kevin W. Griffiths

Client Sample ID	Lab ID	Collect Date	Receive Date	Sampling Site
MW19_120919	1934851001	12/09/19	12/13/19	
18WW10_120919	1934851002	12/09/19	12/13/19	
18WW06_120919	1934851003	12/09/19	12/13/19	
18WW02_120919	1934851004	12/09/19	12/13/19	
MW16_120919	1934851005	12/09/19	12/13/19	
18CPTMW23_120919	1934851006	12/09/19	12/13/19	
18CPTMW14_120919	1934851007	12/09/19	12/13/19	



ANALYTICAL REPORT

Workorder: **34-1934851**Client: ALS Environmental
(Houston)

Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: MW19_120919	Sampling Site: NA	Collected: 12/09/2019				
Lab ID: 1934851001	Media: 125 mL Nalgene	Received: 12/13/2019				
Matrix: Water	Sampling Parameter: NA					
Analysis Method - EPA 6850, DoD QSM						
Preparation: Not Applicable	Analysis: EPA 6850, DoD QSM Water Batch: ELMS/2330 (HBN: 254116) Analyzed: 12/20/2019 14:15	Instrument ID: LCMS04 %Solids: NA Report Basis: Wet				
Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Sample ID: 18WW10_120919	Sampling Site: NA	Collected: 12/09/2019				
Lab ID: 1934851002	Media: 125 mL Nalgene	Received: 12/13/2019				
Matrix: Water	Sampling Parameter: NA					
Analysis Method - EPA 6850, DoD QSM						
Preparation: Not Applicable	Analysis: EPA 6850, DoD QSM Water Batch: ELMS/2330 (HBN: 254116) Analyzed: 12/20/2019 14:57	Instrument ID: LCMS04 %Solids: NA Report Basis: Wet				
Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Sample ID: 18WW06_120919	Sampling Site: NA	Collected: 12/09/2019				
Lab ID: 1934851003	Media: 125 mL Nalgene	Received: 12/13/2019				
Matrix: Water	Sampling Parameter: NA					
Analysis Method - EPA 6850, DoD QSM						
Preparation: Not Applicable	Analysis: EPA 6850, DoD QSM Water Batch: ELMS/2330 (HBN: 254116) Analyzed: 12/20/2019 15:11	Instrument ID: LCMS04 %Solids: NA Report Basis: Wet				
Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Sample ID: 18WW02_120919	Sampling Site: NA	Collected: 12/09/2019				
Lab ID: 1934851004	Media: 125 mL Nalgene	Received: 12/13/2019				
Matrix: Water	Sampling Parameter: NA					
Analysis Method - EPA 6850, DoD QSM						
Preparation: Not Applicable	Analysis: EPA 6850, DoD QSM Water Batch: ELMS/2330 (HBN: 254116) Analyzed: 12/20/2019 15:25	Instrument ID: LCMS04 %Solids: NA Report Basis: Wet				
Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U



ANALYTICAL REPORT

Workorder: **34-1934851**Client: ALS Environmental
(Houston)

Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: MW16_120919	Sampling Site: NA	Collected: 12/09/2019				
Lab ID: 1934851005	Media: 125 mL Nalgene	Received: 12/13/2019				
Matrix: Water	Sampling Parameter: NA					
Analysis Method - EPA 6850, DoD QSM						
Preparation: Not Applicable	Analysis: EPA 6850, DoD QSM Water Batch: ELMS/2330 (HBN: 254116) Analyzed: 12/20/2019 15:39	Instrument ID: LCMS04 %Solids: NA Report Basis: Wet				
Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	1.8	1.0	2.0	4.0	1	J

Sample ID: 18CPTMW23_120919	Sampling Site: NA	Collected: 12/09/2019				
Lab ID: 1934851006	Media: 125 mL Nalgene	Received: 12/13/2019				
Matrix: Water	Sampling Parameter: NA					
Analysis Method - EPA 6850, DoD QSM						
Preparation: Not Applicable	Analysis: EPA 6850, DoD QSM Water Batch: ELMS/2330 (HBN: 254116) Analyzed: 12/20/2019 15:53	Instrument ID: LCMS04 %Solids: NA Report Basis: Wet				
Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	73	1.0	2.0	4.0	1	

Sample ID: 18CPTMW14_120919	Sampling Site: NA	Collected: 12/09/2019				
Lab ID: 1934851007	Media: 125 mL Nalgene	Received: 12/13/2019				
Matrix: Water	Sampling Parameter: NA					
Analysis Method - EPA 6850, DoD QSM						
Preparation: Not Applicable	Analysis: EPA 6850, DoD QSM Water Batch: ELMS/2330 (HBN: 254116) Analyzed: 12/20/2019 16:07	Instrument ID: LCMS04 %Solids: NA Report Basis: Wet				
Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	2600	100	200	400	100	

Comments

Quality Control: EPA 6850, DoD QSM - (HBN: 254116)

Field sample 1934851007 was analyzed and reported from a 1:100 dilution. Field sample 1935343005 was analyzed and reported from a 1:10 dilution. Field samples 1935343004/06 were analyzed and reported from 1:1,000 dilutions. The reporting limits have been adjusted accordingly.

Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Method	Analyst	Peer Review
EPA 6850, DoD QSM	/S/ Thomas Bosch 12/23/2019 10:15	/S/ Stephen Brose 12/23/2019 13:19



ANALYTICAL REPORT

Workorder: 34-1934851

Client: ALS Environmental
(Houston)

Project Manager: Kevin W. Griffiths

Laboratory Contact Information

ALS Environmental
960 W Levoy Drive
Salt Lake City, Utah 84123Phone: (801) 266-7700
Email: als.lt.lab@ALSGlobal.com
Web: www.alslc.com

General Lab Comments

The results provided in this report relate only to the items tested.
 Samples were received in acceptable condition unless otherwise noted.
 Samples have not been blank corrected unless otherwise noted.
 This test report shall not be reproduced, except in full, without written approval of ALS.

ALS provides professional analytical services for all samples submitted. ALS is not in a position to interpret the data and assumes no responsibility for the quality of the samples submitted.

All quality control samples processed with the samples in this report yielded acceptable results unless otherwise noted.

ALS is accredited for specific fields of testing (scopes) in the following testing sectors. The quality system implemented at ALS conforms to accreditation requirements and is applied to all analytical testing performed by ALS. The following table lists testing sector, accreditation body, accreditation number and website. Please contact these accrediting bodies or your ALS project manager for the current scope of accreditation that applies to your analytical testing.

Testing Sector	Accreditation Body (Standard)	Certificate Number	Website
Environmental	PJLA (DoD ELAP)	L17-506	http://www.pjllabs.com
	PJLA (ISO 17025)	L17-507-R1	http://www.pjllabs.com
	Utah (TNI)	UT00953	http://lams.nelac-institute.org/search
	Iowa (TNI)	IA# 376	http://www.shl.uiowa.edu/labcert/idnr/
	Kansas	E-10416	http://www.kdheks.gov/envlab/disclaimer.html
Industrial Hygiene	AIHA (ISO 17025 & AIHA IHLAP)	101574	http://www.aihaaccreditedlabs.org
	DOECAP-AP	L18-606	http://www.pjllabs.com
	Washington	C596	https://ecology.wa.gov/Regulations-Permits/Permits-certifications/Laboratory-Accreditation
Dietary Supplements	PJLA (ISO 17025)	L17-507-R1	http://www.pjllabs.com

Result Symbol Definitions

MDL = Method Detection Limit, a statistical estimate of method/media/instrument sensitivity.

RL = Reporting Limit, a verified value of method/media/instrument sensitivity.

CRDL = Contract Required Detection Limit

Reg. Limit = Regulatory Limit.

ND = Not Detected, testing result not detected above the MDL or RL.

< Means this testing result is less than the numerical value.

** No result could be reported, see sample comments for details.

Qualifier Symbol Definitions

U = Qualifier indicates that the analyte was not detected above the MDL.

J = Qualifier Indicates that the analyte value is between the MDL and the RL. It is also used to indicate an estimated value for tentatively identified compounds in mass spectrometry where a 1:1 response is assumed.

B = Qualifier indicates that the analyte was detected in the blank.

E = Qualifier indicates that the analyte result exceeds calibration range.

P = Qualifier indicates that the RPD between the two columns is greater than 40%.



Quality Control Sample Batch Report

00957688

Analysis Information

Workorder: 1934851

Limits: Client SOW/Contract Specified
Basis: DoD QSM

Preparation: NA
Batch: NA
Prepared By: NA

Analysis: EPA 6850, DoD QSM
Batch: ELMS/2330 (HBN: 254116)
Analyzed By: Thomas Bosch

Blank

LMB: 689411 Analyzed: 12/20/2019 14:02 Units: ug/L			
Analyte	Result	MDL	RL
Perchlorate	ND	1	2.00

Laboratory Control Sample

LCS: 689408 Analyzed: 12/20/2019 13:34 Dilution: 1 Units: ug/L				
Analyte	Result	Target	% Rec	QC Limits
Perchlorate	3.31	3.00	110	78.8 123.8

Matrix Spike - Matrix Spike Duplicate

Sample: 1934851001 Analyzed: 12/20/2019 14:15 Dilution: 1 Units: ug/L		MS: 689412 Analyzed: 12/20/2019 14:29 Dilution: 1 Units: ug/L				MSD: 689413 Analyzed: 12/20/2019 14:43 Dilution: 1 Units: ug/L			
Analyte	Result	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits
Perchlorate	ND	2.84	3	94.6	78.8 123.8	2.81	93.7	0.934	0.0 20.0

Comments

Field sample 1934851007 was analyzed and reported from a 1:100 dilution. Field sample 1935343005 was analyzed and reported from a 1:10 dilution. Field samples 1935343004/06 were analyzed and reported from 1:1,000 dilutions. The reporting limits have been adjusted accordingly.

QC Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Analyst	Peer Review
/S/ Thomas Bosch 12/23/2019 10:57	/S/ Stephen Brose 12/23/2019 13:19

Symbols and Definitions

- * - Analyte above reporting limit or outside of control limits
- ▲ - Sample result is greater than 4 times the spike added
- - Sample and Matrix Duplicate less than 5 times the reporting limit
- - Result is above the calibration range
- # - The Matrix Spike, Matrix Spike duplicate or Matrix Duplicate is reported for your information only. The sample matrix may be inappropriate for the method selected.

- RPD - Relative % Difference (Spike / Spike Duplicate)
- ND - Not Detected (U - Qualifier also flags analyte as not detected)
- NA - Not Applicable
- QC results are not adjusted for moisture correction, where applicable



W

1934851

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

18698/#2

COC ID: 12826

1934851

SAMPLING STATE: Texas

SUBCONTRACT TO:

ALS Laboratory Group
960 LeVoy Dr
Salt Lake City, UT 84123

Phone: +1 801 266 7700

CUSTOMER INFORMATION:

Company: ALS Houston
Contact: RJ Modashia
Address: 10450 Stancliff Rd, Ste 210
Phone: +1 281 530 5656
Email: RJ.Modashia@alsglobal.com
Alternate Contact: Jumoke M. Lawal
Email: jumoke.lawal@alsglobal.com

INVOICE INFORMATION:

Company: ALS Houston
Contact: Accounts Payable
Address: 10450 Stancliff Rd, Ste 210
Phone: +1 281 530 5656
Reference: HS19120544
TSR: Danielle Winnings

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	HS19120544-01	MW19_120919	Groundwater	09 Dec 2019 08:15
	SUB_Perch-6850			18 Dec 2019
2.	HS19120544-02	18WW10_120919	Groundwater	09 Dec 2019 09:05
	SUB_Perch-6850			18 Dec 2019
3.	HS19120544-03	18WW06_120919	Groundwater	09 Dec 2019 09:55
	SUB_Perch-6850			18 Dec 2019
4.	HS19120544-04	18WW02_120919	Groundwater	09 Dec 2019 10:45
	SUB_Perch-6850			18 Dec 2019
5.	HS19120544-05	MW16_120919	Groundwater	09 Dec 2019 11:40
	SUB_Perch-6850			18 Dec 2019
6.	HS19120544-06	18CptMW23_120919	Groundwater	09 Dec 2019 12:30
	SUB_Perch-6850			18 Dec 2019
7.	HS19120544-07	18CptMW14_120919	Groundwater	09 Dec 2019 13:20
	SUB_Perch-6850			18 Dec 2019

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



Subcontract Chain of Custody

SAMPLING STATE: **Texas**

COC ID: **12826**

QC Level: DOD IV (DoD Data Package)

Relinquished By: *NA*

Date/Time: 12.12.19 19.00

Received By: *[Signature]*

Date/Time: 12/13/19 0854

Cooler ID(s): _____

Temperature(s): _____



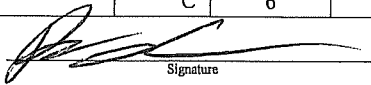
ALS Environmental
CHAIN-OF-CUSTODY

Project / Job / Task: HS19120544		Split:	Workorder ID: 1934851	Level: ENV_LVL4	Requested Analysis	
Client: ALS Environmental (Houston)		Account: 8101		Type: 125Poly		
Comments:						
Item	Collect Date/Time	Sample ID	Lab ID	QC	Matrix	Count
1	12/09/2019 08:15	MW19_120919	1934851001		Water	1
2	12/09/2019 09:05	18WW10_120919	1934851002		Water	1
3	12/09/2019 09:55	18WW06_120919	1934851003		Water	1
4	12/09/2019 10:45	18WW02_120919	1934851004		Water	1
5	12/09/2019 11:40	MW16_120919	1934851005		Water	1
6	12/09/2019 12:30	18CPTMW23_120919	1934851006		Water	1
7	12/09/2019 13:20	18CPTMW14_120919	1934851007		Water	1
8						
9						
10						

ORIGINAL FIELD SAMPLE CHAIN-OF-CUSTODY				SAMPLE PREPARATION / ANALYSIS CHAIN-OF-CUSTODY			
Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location	Sample Prep / Analysis for:	Lab Notebook No.:	Prepared / Analyzed by:	Date / Time:
<i>Warath, Julie</i>	12/13/2019 08:54	ALS Sample Receiving	Sample Login				
<i>Julie Warath</i>	12/19/19 1400	<i>LSB</i>	storage				
<i>R-33.1</i>	12-19-19 14:00	<i>T. Bush</i>	CLD analysis				

ALS-SALT LAKE CITY-RELATED INFORMATION REPORT (CRIR)

COOLER OR CONTAINER INFORMATION CHECKLIST (Fill In or Circle)

Client Name: <u>ALS Houston</u>		Project/Task/Site: <u>HS19120544</u>							
Date/Time of Receipt: <u>12/13/19</u> <u>0854</u>		Number of Coolers Received: <u>1</u> <u>193485</u>							
Condition of Coolers: <u>Acceptable/Unacceptable</u>		Temperature Control: <u>Present/Not Included</u>							
Cooler Custody Seals: <u>Present/Absent/NA</u>		Location Temp Taken: <u>Control/Between Samples</u>							
Container Custody Seals: <u>Intact/Broken/NA</u>		Are all temperatures within project specific guidelines? Yes/No/ <u>NA</u>							
Ice Present: <u>Present/Absent/NA</u>		VOA Headspace Present? Yes/No/ <u>NA</u>							
Ice Present: <u>Yes/No/NA</u>									
Ice Present: <u>Frozen/Melted/NA</u>									
pH Check Performed:	Metals	Yes/No/NA	Total Phenolics	Yes/No/NA	NO3/NO2	Yes/No/NA			
	Cyanide	Yes/No/NA	TPH - 418.1	Yes/No/NA	Oil & Grease	Yes/No/NA			
	Sulfide	Yes/No/NA	COD	Yes/No/NA	Total Phosphorous	Yes/No/NA			
	Ammonia	Yes/No/NA	TKN	Yes/No/NA	Gross A.B, Gamma Spec	Yes/No/NA			
Cooler Received	Cooler Condition	Temp.	Cooler Received	Cooler Condition	Temp.	Cooler Received	Cooler Condition	Temp.	
1	<u>Good</u>	<u>6</u> °C	4		°C	7		°C	
2		°C	5		°C	8		°C	
3		°C	6		°C	9		°C	
Taken By: 		Signature		<u>Rebecca Wise</u>		Printed Name		<u>12/13/19</u>	Date

CLIENT-RELATED INFORMATION

<input type="checkbox"/> Missing Cooler	<input type="checkbox"/> Missing Samples/Bottles	<input type="checkbox"/> Incorrect Preservation	<input type="checkbox"/> Insufficient Sample Volume
<input type="checkbox"/> Cooler Conditions	<input type="checkbox"/> Broken/Leaking Samples	<input type="checkbox"/> pH Criteria Not Met	<input type="checkbox"/> Chain of Custody Problems
<input type="checkbox"/> Missing Paperwork	<input type="checkbox"/> Incorrect Bottle Type	<input type="checkbox"/> Residual Chlorine Present	<input type="checkbox"/> Other:
<input type="checkbox"/> Missing/Incorrect Bottle Labels	<input type="checkbox"/> Cooler Temperatures Out of Range	<input type="checkbox"/> Head Space in Bottles	

BRIEFLY DESCRIBE THE PROBLEM AND THE ACTION TAKEN:

Client Notified? YES NO

Response Required Within 24 Hours

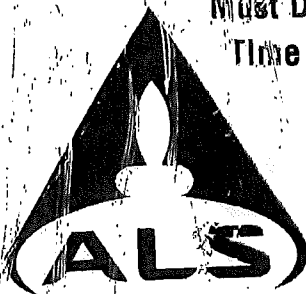
PROJECT MANAGEMENT

PROJECT MANAGER COMMENTS:

ALS Project Manager: _____ Returned to Sample Receipt by: _____ Date: _____

Printed Name Signature

Must Deliver Next Business Day
Time and Temperature Sensitive!



Part 2 12/13/99-12/17/02 EXP 10/20 00

ORIGIN ID:SGRA (281) 530-5856
CLIENT SERVICES
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON, TX 77089
UNITED STATES US

SHIP DATE: 12DEC19
ACTWGT: 29.05 LB
CAD: 300130/CAFE9211
DIMS: 18x16x13 IN

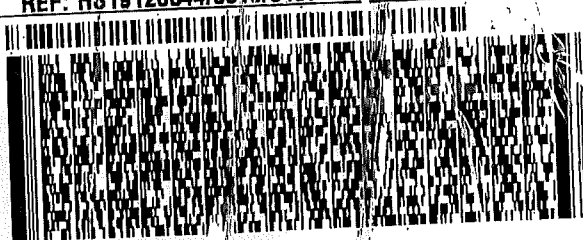
BILL THIRD PARTY

TO **SAMPLE RECEIVING
ALS ENVIRONMENTAL
960 W. LEVOY DRIVE**

SALT LAKE CITY UT 84123

(801) 266-7700

REF: HS18120544/0610/0497 - R/W/W



**FedEx
Express**



A10509081131J

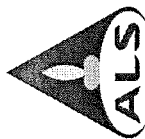
TRK# 1251 0292 8694
0201

**FRI -- 13 DEC 10:30A
PRIORITY OVERNIGHT**

AX BTFA

**84123
UT-US SLC**





Batch Worklist

HBN: 254116

Instrument:

Created: 12/20/2019 13:12

Batch: ELMS/2330



Status: WP

Analyst: T. Bosch

Rule: EPA 6850, DoD QSM Water

Workorder: 1934851 [ENV_LVL4]

Workorder: 1935316 [ENV_LVL4]

Workorder: 1935343 [ENV_LVL4]

Pos	Lab ID	Sample ID	Prep Initial	Prep Final	Dust Weight	Type	Mx	Container	Procedure	Mgr	Expire Date	Due Date	Run Date
1	689407	CCV for HBN 254116 [ELMS/2330]				CCV	3		E685041C3Q	5311		12/27/2019	
2	689408	LCS for HBN 254116 [ELMS/2330]				LCS	3		E6850Q413Q	5311		12/27/2019	
3	689409	RLVS for HBN 254116 [ELMS/2330]				RLVS	3		E685041C3Q	5311		12/27/2019	
4	689410	ICS for HBN 254116 [ELMS/2330]				ICS	3		E6850.D3Q	5311		12/27/2019	
5	689411	LMB for HBN 254116 [ELMS/2330]				LMB	3		E6850Q413Q	5311		12/27/2019	
6	1934851001	MW19_120919				SAMPLE	3	1934851001-A	E6850Q41.3	5480	1/6/2020	12/27/2019	
7	689412	MW19_120919(1934851001MS)				MS	3		E6850Q413Q	5311		12/27/2019	
8	689413	MW19_120919(1934851001MSD)				MSD	3		E6850Q413Q	5311		12/27/2019	
9	1934851002	18WW10_120919				SAMPLE	3	1934851002-A	E6850Q41.3	5480	1/6/2020	12/27/2019	
10	1934851003	18WW06_120919				SAMPLE	3	1934851003-A	E6850Q41.3	5480	1/6/2020	12/27/2019	
11	1934851004	18WW02_120919				SAMPLE	3	1934851004-A	E6850Q41.3	5480	1/6/2020	12/27/2019	
12	1934851005	MW16_120919				SAMPLE	3	1934851005-A	E6850Q41.3	5480	1/6/2020	12/27/2019	
13	1934851006	18CPTMW23_120919				SAMPLE	3	1934851006-A	E6850Q41.3	5480	1/6/2020	12/27/2019	
14	1934851007	18CPTMW14_120919				SAMPLE	3	1934851007-A	E6850Q41.3	5480	1/6/2020	12/27/2019	
15	1935316001	MW2_121319				SAMPLE	3	1935316001-A	E6850Q41.3	5480	1/10/2020	12/31/2019	
16	689414	CCV for HBN 254116 [ELMS/2330]				CCV	3		E685041C3Q	5311		12/27/2019	
17	1935316002	MW2_121319_a				SAMPLE	3	1935316002-A	E6850Q41.3	5480	1/10/2020	12/31/2019	
18	1935316003	18CPTMW01SW_121319				SAMPLE	3	1935316003-A	E6850Q41.3	5480	1/10/2020	12/31/2019	
19	1935316004	AWD1_121319				SAMPLE	3	1935316004-A	E6850Q41.3	5480	1/10/2020	12/31/2019	
20	1935343001	18CpTMW16_121319				SAMPLE	3	1935343001-A	E6850Q41.3	5480	1/10/2020	12/31/2019	
21	1935343002	AWD3_121319				SAMPLE	3	1935343002-A	E6850Q41.3	5480	1/10/2020	12/31/2019	
22	1935343003	AWD3_121319_a				SAMPLE	3	1935343003-A	E6850Q41.3	5480	1/10/2020	12/31/2019	
23	1935343004	MW5_121319				SAMPLE	3	1935343004-A	E6850Q41.3	5480	1/10/2020	12/31/2019	
24	1935343005	18CpTMW08DW_121319				SAMPLE	3	1935343005-A	E6850Q41.3	5480	1/10/2020	12/31/2019	
25	1935343006	18CpTMW08SW_121319				SAMPLE	3	1935343006-A	E6850Q41.3	5480	1/10/2020	12/31/2019	
26	689415	CCV for HBN 254116 [ELMS/2330]				CCV	3		E685041C3Q	5311		12/27/2019	



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Analytical Documentation

Analyst Write-upALS Work Order #'s & Sample #(')s: 1934851 (001-07); 1935316 (001-04); 1935343 (001-06)ELMS Batch/HBN ID: 2330 (254116)Prep Date: 12/19/2019 Analysis Date: 12/20/2019 Analyst: Tom BoschAnalyte: **Perchlorate** Matrix: **Water** Method: **6850**Sequence: \\HPCHEM\1\SEQUENCE\CLO4\2019\DEC\20DEC19D.sReported DL: **1.0µg/L** Reported LOD: **2.0µg/L** Reported LOQ: **4.0µg/L**SAMPLE PREPARATION/ANALYSIS:

Water: Samples were prepared by Tom Bosch. 10.0mL of each sample was pipetted into a 15-mL centrifuge tube, and 50µL of an oxygen-18 labeled perchlorate solution was added as an internal standard. The samples were capped, vortexed, and filtered with Phenex PES membrane 0.45µm Syringe filters prior to analysis.

REAGENTS: Eluent A1: 95% ASTM Type II water (ALS)/5%ACN (B&J Lot DU461-US)/0.1% glacial acetic acid (JT-Baker Lot 122550).
Eluent B1: 95% ACN (B&J Lot DU461-US)/5% ASTM Type II water (ALS)/0.1% glacial acetic acid (JT-Baker Lot 122550).

STANDARDS: Internal Standard Spiking Solution Horizon# 47863. Dilutions of Working Standards (Horizon: 49947/48) used for ICAL, CCV's, RLVS and ICS.

CALIBRATION CURVE: Used curve from 09/20/2019, sequence 20SEP19D.s Offline Quantitation Method: CLO4-DP3.M

INSTRUMENT CONDITIONS: Samples were analyzed with an Agilent 1100 LC/MSD system, in negative SIM mode, monitoring m/z 83, 85, and 89.

Instrument ID: LCMS04 Online Acquisition Method: CLO4-AQN.M Fragmentor: 160 Output Gain: 8 Injection Volume: 35µL
Column: KP-RPPX C8 separator, 250mm Mobile Phase: 70% Eluent A1; 30% Eluent B1 Run time: 12.0min.

FLOW GRADIENT:

Time (min.)	Flow (mL/min)
0	0.65
5.8	0.65
5.9	0.25
10.3	0.25
10.5	0.65
12.0	0.65

QC DATA: 3.0µL of QC Solution Horizon ID 47516 was used for LCS 689408; Target = 3.0µg/L. ASTM type II water was used for LMB 689411.

MS/MSD: The Matrix Spike and duplicate (MS/MSD) was performed on sample 1934851001 (Client ID's: MW19_120919). 3.0µl of Working Standard Solution Horizon ID 49947 was added to 10.0mL of sample preparation. Spike target = 3.0µg/L.

COMMENTS:

- 1) Results reported in µg/L. Field sample 1934851007 was analyzed and reported from a 1:100 dilution. Field sample 1935343005 was analyzed and reported from a 1:10 dilution. Field samples 1935343004/06 were analyzed and reported from 1:1,000 dilutions. The reporting limits have been adjusted accordingly.
- 2) All QC, Blank, CCV, and MS/MSD results were within method parameters.
- 3) Sample data can be viewed at two directories within the ALS system: \\ALSLTWS013\LCMS\LCMS04\2019\DEC\HBN# or through NuGenesis\Tree\PrintData\LCMS\DefaultView.
- 4) Notebook: \\alsltws013\ORGANIC\BOSCH\LCMS\Perchlorates\Waters\2019\254116-DoD-ALS-Hstn LCMS4 or through \\ALSLTWS013\DATA\REVIEW\HBN#
- 5) The Reporting Limit Verification Standard (RLVS – 689409) is reported from the analysis of the Laboratory Control Sample (LCS – 689408) at a level of 3.0µg/L.
- 6) Due to limitations of the Chemstation Software, some of the chromatographic peaks require manual integration. Manual Integrations were performed for one of the Initial Calibration analyses (datafile: 20SEPI03) along with datafile 20DEC19D14/16/18/19.

5.5 Chromatography (GC, HPLC and LC/MS) Technical Review

Note: It is the peer reviewer's responsibility to ensure that appropriate criteria are used as defined in the HORIZON PROFILE. The evaluation criteria are prioritized as per Section 2.2 of this SOP. These items must be checked for all projects. The following checklist will be completed by both the analyst and the peer reviewer and scanned into the HBN folder with the raw data.

Chromatography (GC, HPLC, LC/MS) Technical Review Criteria	Analyst Initials	Reviewer Initials
Batch(es)/SDG: <u>ELMS: 2330 HBN: 254116</u>		
Sample Set IDs if Applicable: <u>1934851 / 1935316 / 1935343</u>		
<u>Sample positions on autosampler verified against instrument sequence</u>	TB	NA
Calibration standards analyzed and meets criteria	TB	SB
Standards traceability checked and meets criteria	TB	SB
Standard curve coefficients evaluated and meet criteria	TB	SB
ICVs analyzed and meet acceptance criteria	TB	SB
CCVs analyzed and meet acceptance criteria	TB	SB
Retention Time Windows checked	TB	SB
For method 8081A, Endrin/DDT Breakdown is checked for compliance	—	—
Surrogate recoveries checked and appropriately addressed	—	—
Method Preparation Blanks analyzed and meet acceptance criteria	TB	SB
MSs, MSDs, and/or MDs analyzed and calculations checked; applicable	TB	SB
RLVS analyzed	TB	SB
Preparation and analysis hold times met	TB	SB
Preparation deviations and re-preparations noted when performed	TB	SB
Analysis deviations and re-analyses noted when performed	TB	SB
Sample dilution factors noted on reports	TB	SB
Electronic records in HBN transcription accuracy and completeness	TB	SB
Preparation and analysis calculations checked	TB	SB
NCRs are completed as necessary NC/CAR# _____	TB	SB
Report forms are complete and accurate	TB	SB
Manual integrations checked	TB	SB



STANDARD REPORT

Working Standard - CLO4ISTDWRK

CLO4ISTDWRK		Description - Perchlorate ISTD Wrk 1,000ug/L			
Standard: 49946		Created By: Thomas Bosch		Amount: 25 mL	
MFG: ALS/SLC		Create Date: 09/23/2019 03:09PM		Expires: 09/19/2020	
MFG Lot: TNB: 09/20/2019		Verified By: Thomas Bosch		Usable: Yes	
Pipette ID: Not Provided		Verify Date:		Lab Lot: CLO4ISTDWRK	
Pos.	Analyte	Name	Concentration		
1	14797-73-0-8385	Perchlorate 83:85 Ratio	1000 ug/L		
2	14797-73-0-89	Perchlorate 89	1000 ug/L		
Composition					
Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
47863	CLO4ISTDSTK	Perchlorate ISTD Stock	CLO4ISTDSTK	0.25 mL	12/05/2028



STANDARD REPORT

Constituent

Stock Standard - CLO4ISTDSTK

CLO4ISTDSTK		Description - Perchlorate ISTD Stock	
Standard: 47863		Created By: Thomas Bosch	Amount: 1 mL
MFG: Cambridge Isotope		Create Date: 05/23/2019 10:05AM	Expires: 12/05/2028
MFG Lot: SDIH-016		Verified By: Thomas Bosch	Usable: Yes
Part ID: OLM-7310-S		Verify Date:	Lab Lot: CLO4ISTDSTK
Pos.	Analyte	Name	Concentration
1	14797-73-0-8385	Perchlorate 83:85 Ratio	100 ug/mL
2	14797-73-0-89	Perchlorate 89	100 ug/mL



STANDARD REPORT

Working Standard - CLO4 WRK

CLO4 WRK		Description - 6850 WKG Std 100.ug/L			
Standard: 49948		Created By: Thomas Bosch		Amount: 10 mL	
MFG: ALS/SLC		Create Date: 09/20/2019 03:09PM		Expires: 07/25/2020	
MFG Lot: TNB: 09/20/2019				Usable: Yes	
Pipette ID: Not Provided				Lab Lot: CLO4 WRK	
Pos.	Analyte	Name	Concentration		
1	14797-73-0	Perchlorate	0.1 ug/mL		
2	14797-73-0-8385	Perchlorate 83:85 Ratio	0.1 ug/mL		
Composition					
Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
49947	CLO4 INT	6850 Intermdt AccStd 10.ug/mL	CLO4 INT	0.1 mL	07/25/2020



STANDARD REPORT

Constituent

Stock Standard - CLO4 STOCK

CLO4 STOCK		Description - 6850 Stock AccStd 1,000ug/mL	
Standard: 43659		Created By: Thomas Bosch	
MFG: AccuStandard		Create Date: 09/17/2018 09:09AM	
MFG Lot: 218065075		Amount: 100 mL	
Part ID: IC-PER-10X-1		Expires: 07/25/2020	
		Usable: Yes	
		Lab Lot: CLO4 STOCK	
Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	1000 ug/mL
2	14797-73-0-8385	Perchlorate 83:85 Ratio	1000 ug/mL



STANDARD REPORT

Constituent

Solvent Standard - ASTM H2O

ASTM H2O		Description - ASTM Type II Water	
Standard: 109	Created By: ALS Support (Lims)	Amount: 1000 L	
MFG: DCL In House	Create Date: 10/06/2005 09:10AM	Expires: 11/07/2025	
MFG Lot: Not Provided		Usable: Yes	
Part ID: Not Provided		Lab Lot: LAB 109	
Pos.	Analyte	Name	Concentration
Solvent - Analyte(s) not applicable			



STANDARD REPORT

Constituent

Working Standard - CLO4 INT

CLO4 INT		Description - 6850 Intermdt AccStd 10.ug/mL			
Standard: 49947		Created By: Thomas Bosch		Amount: 10 mL	
MFG: ALS/SLC		Create Date: 09/23/2019 03:09PM		Expires: 07/25/2020	
MFG Lot: TNB: 09/20/2019				Usable: Yes	
Pipette ID: Not Provided				Lab Lot: CLO4 INT	
Pos.	Analyte	Name	Concentration		
1	14797-73-0	Perchlorate	10 ug/mL		
2	14797-73-0-8385	Perchlorate 83:85 Ratio	10 ug/mL		
Composition					
Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
43659	CLO4 STOCK	6850 Stock AccStd 1,000ug/mL	CLO4 STOCK	0.1 mL	07/25/2020



STANDARD REPORT

Working Standard - CLO4 QC WRK

CLO4 QC WRK		Description - 6850 QC WKG STD 100ug/L			
Standard: 47516		Created By: Thomas Bosch		Amount: 10 mL	
MFG: ALS/SLC		Create Date: 05/06/2019 03:05PM		Expires: 03/31/2020	
MFG Lot: TNB: 05/06/2019				Usable: Yes	
Pipette ID: Not Provided		Lab Lot: CLO4 QC WRK 100.ug/L			
Pos.	Analyte	Name	Concentration		
1	14797-73-0	Perchlorate	100 ug/L		
Composition					
Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
47515	CLO4 QC INT	6850 QC Intrmdt Std-QC 10ug/mL	CLO4 QC INT 10.ug/mL	0.1 mL	03/31/2020



STANDARD REPORT

Constituent

Solvent Standard - ASTM H2O

ASTM H2O		Description - ASTM Type II Water	
Standard: 109	Created By: ALS Support (Lims)	Amount: 1000 L	
MFG: DCL In House	Create Date: 10/06/2005 09:10AM	Expires: 11/07/2025	
MFG Lot: Not Provided		Usable: Yes	
Part ID: Not Provided		Lab Lot: LAB 109	
Pos.	Analyte	Name	Concentration
Solvent - Analyte(s) not applicable			



STANDARD REPORT

Constituent

Stock Standard - CLO4 QCSTOCK

CLO4 QCSTOCK		Description - 6850 QC Stock STD 1,000ug/mL	
Standard: 36748		Created By: Thomas Bosch	
MFG: Ultra Scientific		Create Date: 05/11/2017 01:05PM	
MFG Lot: CP-0860		Amount: 100 mL	
Part ID: ICC-013		Expires: 03/31/2020	
		Usable: Yes	
		Lab Lot: CLO4 QC STOCK	
Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	1000 ug/mL



STANDARD REPORT

Constituent

Working Standard - CLO4 QC INT

CLO4 QC INT		Description - 6850 QC Intrmdt Std-QC 10ug/mL			
Standard: 47515		Created By: Thomas Bosch		Amount: 10 mL	
MFG: ALS/SLC		Create Date: 05/06/2019 03:05PM		Expires: 03/31/2020	
MFG Lot: TNB: 05/06/2019				Usable: Yes	
Pipette ID: Not Provided				Lab Lot: CLO4 QC INT 10.ug/mL	
Pos.	Analyte	Name		Concentration	
1	14797-73-0	Perchlorate		10 ug/mL	
Composition					
Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
36748	CLO4 QCSTOCK	6850 QC Stock STD 1,000ug/mL	CLO4 QC STOCK	0.1 mL	03/31/2020

125 Market Street
New Haven, CT 06513
USA



Tel (203)786-5290
Fax (203)786-5287
www.AccuStandard.com

CERTIFICATE OF ANALYSIS



43659

AccuTrace™ Reference Standard

Catalog No: IC-PER-10X-1
Description: Perchlorate Standard
Element: Perchlorate (ClO₄)
SRM: Ind. Std.
Lot: 218065075
Matrix: Water
Hazards: Refer to SDS for complete safety information

Date Certified: Jun 25, 2018
Expiration: Jul 25, 2020
Sample Size: 100 mL
Components: 1
Storage Condition: Ambient (>5 °C)
Included on ISO/IEC 17025 Scope of Accreditation: Yes
Included on ISO 17034 Scope of Accreditation: Yes



Signal Word: None

Component	SRM #	Prepared Concentration (µg/mL)
ClO ₄ Perchlorate	Ind. Std.	1000

The gravimetric uncertainty for this product is $\pm 0.24\%$.

The final solution was checked against an independent standard to verify its concentration.

We use the highest purity raw materials available to minimize impurity levels in the final solution. Typically 99.999%+ pure starting materials are used as well as ASTM Type I 18 megohm deionized water.

All solutions are filtered through a 0.2 µm filter prior to being bottled.

All glassware used in preparation is Class A and calibrated regularly.

All weights are traceable through NIST; Test No. 822-275872-11

All bottles are triple rinsed with deionized water prior to use.

Shake bottle prior to use and do not pipette directly out of the bottle. Use only cleaned Class A volumetric glassware.

We certify the accuracy of this standard to be $\pm 0.5\%$ of the stated value until its expiration date provided it is kept tightly capped and stored under the conditions stated above.

Certified By:

Meigan O'Leary

Meigan O'Leary, Inorganic QC Manager

Page 1 of 1

For use in routine laboratory analysis.

AccuStandard is accredited to ISO 17034, ISO/IEC 17025 and certified to ISO 9001:2015

QR-ORG/INO-001
Rev. 5/18



Certificate of Analysis



ISO Guide 34 Reference Material

Product Number: ICC-013
Lot Number: CP-0860



Lot Issue Date: 29-Feb 2016
Expiration Date: 31-Mar 2020

Product Name: Perchlorate IC Standard

Description:

This Reference Material (RM) was gravimetrically prepared in accordance with ISO Guide 34 and under ULTRA Scientific's ISO 9001 registered quality system. The neat materials used for this product have been verified by ULTRA's ISO 17025 laboratory and under ULTRA's ISO Guide 34 accreditation. The analyte concentrations were verified by ULTRA's ISO 17025 accredited laboratory. For each analyte, the true value, with its uncertainty value calculated at the 95% confidence level, is reported below.

Analyte	Starting Material	Lot Number	Purity (%)	Calculated Value	True Value	Traceability & Method
perchlorate	potassium perchlorate	RM07987	100	1001 ± 5 µg/mL	976 ± 6 µg/mL	NIST SRM 3141A; ICP-OES

Solvent: water (low TOC, < 50 ppb)

Storage: Store at Room Temperature (15° to 30°C).

Traceability:

Traceability has been established through an unbroken chain of comparisons, each having stated uncertainties. Comparisons are based on appropriate physical or chemical measurements, including gravimetric or volumetric dilution, where the mass or volume of a solution before and after dilution is measured. The balances used for these measurements are calibrated with weights traceable to NIST in compliance with ANSI/NCCL Z-540-1, ISO 9001, ISO 17025, and ISO Guide 34. Calibrated Class A glassware is used for volumetric measurements. Thermometers are calibrated against a NIST traceable thermometer in accordance with NIST Special Publication 819.

Estimation of Uncertainties:

The true value is reported, with its uncertainty value calculated at the 95% confidence level.

Homogeneity:

This RM was formulated and unitized according to an in-house procedure and is guaranteed to be homogeneous. There is no minimum sub-sample size required.

Intended Use:

This RM is intended for the preparation of working reference samples for use in routine laboratory analyses, calibration of instruments, validation of analytical methods, assessments of measurement methods and continuing calibration verification.

Instructions for Use:

Sample aliquots for analysis should be withdrawn at 20°C to 25°C immediately after opening and should be processed without delay for the true value to be valid within the stated uncertainties. Do not pipet from the bottle. Do not return any material removed for pipetting to the bottle. Tightly cap the bottle after removing any material and store according to the instructions noted above.

Hazards:

Refer to the Safety Data Sheet for information regarding this RM.

Expiration of Certification:

The certification of this RM is valid, within the measurement uncertainty specified, until the expiration date specified above, provided the RM is handled and stored in accordance with the instructions given in this certificate. This certification is nullified if the RM is damaged, contaminated, or otherwise modified.



ISO 9001 Registered Quality System – TUV USA

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Certificate of Analysis

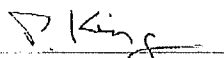



ISO Guide 34 Reference Material

Product Number: ICC-013 Lot Issue Date: 29-Feb 2016
 Lot Number: CP-0860 Expiration Date: 31-Mar 2020

Maintenance of Certification:

The real-time, long term stability of the RM may be monitored over the lifetime of the certification. If substantive changes occur that affect the certification before the expiration of this certificate, ULTRA Scientific will notify the purchaser.


 Peter A. King, Ph.D.
 VP, Technical Operations


 Daniel J. Lamendola
 Director of QA/RA



ISO 9001 Registered Quality System – TUV USA

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Cambridge Isotope Laboratories, Inc.

Certificate of Analysis



Product Name: PERCHLORIC ACID, SODIUM SALT
(Isotopic Label & Enrichment Specification) (18O4, 90%+) 100 UG/ML IN WATER

Lot Number: SDIH-016

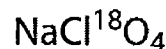
Catalog Number: OLM-7310-S

Product Information

Chemical Purity Specification: $\geq 98\%$

MW*: 130.44
* For Isotopically labeled compounds, MW listed is for the fully enriched product.

Labeled CAS Number: NA



Unlabeled CAS Number: 7601-89-0

Chemical Formula: NaCl*O4

Storage: Store at room temperature away from light and moisture.

Stability: See storage and expiration date.

Certification

Cambridge Isotope Laboratories, Inc. guarantees that this material meets or exceeds the specifications stated. Absolute identity as well as chemical and isotopic purities are assured by the use of unambiguous synthetic routes and multiple chemical analyses whenever possible. Results are representative of QC testing at time of release from Quality Control unless otherwise stated. CIL Certificates of Analysis are occasionally updated with new data following recertification. We recommend checking the website for the latest version.

Volumetric measurements were made with Class A glassware. Gravimetry is traceable to the NIST through calibrated balances and certified, calibrated, standard weights. The calibrations are traceable to the NIST under Test No. 822/270236-04. The calibrations also meet specifications outlined in ISO 9001, ISO/IEC 17025, ANSI/NSCL Z540-1-1994, NCR Document 10CFR50 Appendix B, and applicable subdocuments.

This COA references the bulk catalog number before packaging. The COA also applies to the CIL finished good catalog number. Some possible packaging sizes and their corresponding suffix are -1.2, -1, -0.5, -10, or -0.1.

Approved by: Sashi Sivendran-Basak

Sashi Sivendran-Basak, Ph.D., Quality Review

Quality Control Tests and Results

QC Release Date	12/05/2018
Expiration Date	12/05/2028
Concentration Based on Gravimetry	100.0 \pm 1.0 $\mu\text{g/mL}$ (k=2)
Chemical Purity of Neat Material(s)	98%
LC/MS for Concentration	105.4 \pm 1.1 $\mu\text{g/mL}$ (k=2)



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Batch Review Method:

C:\HPCHEM\1\METHODS\CLO4-DP3.M

['#' ==> Run has not been reprocessed with Batch Review Method
 '*' ==> Run has been saved with batch file]

#*	Sample	Location	Inj	SampleType	Run	Perchlorate Area	Perchlorat RT	Perchlorate Amount		
*	689407	CCV@25	Vial 71	1	Control	1	2.04111e6	7.471	26.70894	
*	689408	QC@3.0	Vial 72	1	Control	2	2.12147e5	7.304	3.31347	
*	689410	ICS@3.0	Vial 73	1	Control	3	1.66491e5	7.340	3.40481	
*	689411	LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000	
*	1934851001		Vial 75	1	Sample	5	0.00000	0.000	0.00000	
*	689412	348511S	Vial 76	1	Sample	6	1.38253e5	7.037	2.83835	
*	689413	348511D	Vial 77	1	Sample	7	1.40128e5	7.058	2.81186	
*	1934851002		Vial 78	1	Sample	8	0.00000	0.000	0.00000	
*	1934851003		Vial 79	1	Sample	9	0.00000	0.000	0.00000	
*	1934851004		Vial 80	1	Sample	10	0.00000	0.000	0.00000	
*	1934851005		Vial 81	1	Sample	11	9.83459e4	7.243	1.78789	
*	1934851006		Vial 82	1	Sample	12	5.44257e6	7.287	72.53538	
*	1934851007	100	Vial 83	1	Sample	13	1.73953e6	7.475	2605.96119	
*	1935316001		Vial 84	1	Sample	14	3.52468e4	7.247	5.74894e-1	<RL
*	689414	CCV@25	Vial 71	1	Control	15	1.84036e6	7.451	26.75450	
*	1935316002		Vial 85	1	Sample	16	3.77116e4	7.221	6.01872e-1	
*	1935316003		Vial 86	1	Sample	17	0.00000	0.000	0.00000	
*	1935316004		Vial 87	1	Sample	18	7.95168e4	7.352	1.36838	
*	1935343001		Vial 88	1	Sample	19	4.74847e4	7.368	6.12339e-1	<RL
*	1935343002		Vial 89	1	Sample	20	2.21821e6	7.450	31.67406	
*	1935343003		Vial 90	1	Sample	21	2.24522e6	7.455	28.95321	
*	1935343004	1K	Vial 91	1	Sample	22	2.15597e6	7.560	3.16912e4	
*	1935343005	10X	Vial 92	1	Sample	23	2.14251e6	7.460	306.28091	
*	1935343006	1K	Vial 93	1	Sample	24	1.59545e6	7.560	2.44498e4	
*	689415	CCV@25	Vial 71	1	Control	26	1.93976e6	7.449	27.06627	

#*	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount	
*	689407	CCV@25	Vial 71	1	Control	1	2.59291e5	7.493	5.00000
*	689408	QC@3.0	Vial 72	1	Control	2	2.35842e5	7.331	5.00000
*	689410	ICS@3.0	Vial 73	1	Control	3	1.80164e5	7.367	5.00000
*	689411	LMB	Vial 74	1	Control	4	2.03065e5	7.582	5.00000
*	1934851001		Vial 75	1	Sample	5	1.95221e5	7.066	5.00000
*	689412	348511S	Vial 76	1	Sample	6	1.79080e5	7.059	5.00000
*	689413	348511D	Vial 77	1	Sample	7	1.83192e5	7.075	5.00000
*	1934851002		Vial 78	1	Sample	8	1.96897e5	7.325	5.00000
*	1934851003		Vial 79	1	Sample	9	2.13267e5	7.369	5.00000
*	1934851004		Vial 80	1	Sample	10	2.55178e5	7.427	5.00000
*	1934851005		Vial 81	1	Sample	11	1.99854e5	7.262	5.00000
*	1934851006		Vial 82	1	Sample	12	2.13698e5	7.303	5.00000
*	1934851007	100	Vial 83	1	Sample	13	2.27091e5	7.495	500.00000
*	1935316001		Vial 84	1	Sample	14	2.04618e5	7.262	5.00000
*	689414	CCV@25	Vial 71	1	Control	15	2.33347e5	7.471	5.00000
*	1935316002		Vial 85	1	Sample	16	2.10291e5	7.237	5.00000
*	1935316003		Vial 86	1	Sample	17	2.35612e5	7.318	5.00000
*	1935316004		Vial 87	1	Sample	18	2.08671e5	7.360	5.00000
*	1935343001		Vial 88	1	Sample	19	2.60797e5	7.401	5.00000
*	1935343002		Vial 89	1	Sample	20	2.32847e5	7.471	5.00000
*	1935343003		Vial 90	1	Sample	21	2.60703e5	7.474	5.00000
*	1935343004	1K	Vial 91	1	Sample	22	2.26176e5	7.573	5000.00000
*	1935343005	10X	Vial 92	1	Sample	23	2.33572e5	7.478	50.00000
*	1935343006	1K	Vial 93	1	Sample	24	2.23474e5	7.585	5000.00000
*	689415	CCV@25	Vial 71	1	Control	26	2.42807e5	7.466	5.00000

Batch Report: C:\HPCHEM\1\DATA\20DEC19D\20DEC19S.B

#*	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount	
*	689407	CCV@25	Vial 71	1	Control	1	5.93972e5	7.487	25.61044
*	689408	QC@3.0	Vial 72	1	Control	2	6.76074e4	7.319	3.37214
*	689410	ICS@3.0	Vial 73	1	Control	3	5.88058e4	7.363	3.85429
*	689411	LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
*	1934851001		Vial 75	1	Sample	5	0.00000	0.000	0.00000
*	689412	348511S	Vial 76	1	Sample	6	4.66372e4	7.052	3.05269
*	689413	348511D	Vial 77	1	Sample	7	4.60206e4	7.076	2.94032
*	1934851002		Vial 78	1	Sample	8	0.00000	0.000	0.00000
*	1934851003		Vial 79	1	Sample	9	0.00000	0.000	0.00000
*	1934851004		Vial 80	1	Sample	10	0.00000	0.000	0.00000
*	1934851005		Vial 81	1	Sample	11	3.27990e4	7.260	1.87240
*	1934851006		Vial 82	1	Sample	12	1.62653e6	7.303	72.09762
*	1934851007	100	Vial 83	1	Sample	13	5.14969e5	7.496	2537.47075
*	1935316001		Vial 84	1	Sample	14	1.31713e4	7.258	6.37095e-1
*	689414	CCV@25	Vial 71	1	Control	15	5.38679e5	7.465	25.79127
*	1935316002		Vial 85	1	Sample	16	1.63168e4	7.250	8.01605e-1
*	1935316003		Vial 86	1	Sample	17	0.00000	0.000	0.00000
*	1935316004		Vial 87	1	Sample	18	2.26779e4	7.376	1.18748
*	1935343001		Vial 88	1	Sample	19	1.63337e4	7.429	6.15421e-1
*	1935343002		Vial 89	1	Sample	20	6.46838e5	7.469	30.49596
*	1935343003		Vial 90	1	Sample	21	6.55399e5	7.466	27.86984
*	1935343004	1K	Vial 91	1	Sample	22	6.33070e5	7.573	3.07034e4
*	1935343005	10X	Vial 92	1	Sample	23	6.46073e5	7.474	303.78698
*	1935343006	1K	Vial 93	1	Sample	24	4.66349e5	7.577	2.35134e4
*	689415	CCV@25	Vial 71	1	Control	26	5.67687e5	7.463	26.09198

*** End of Report ***

Sequence Table:

Method and Injection Info Part:

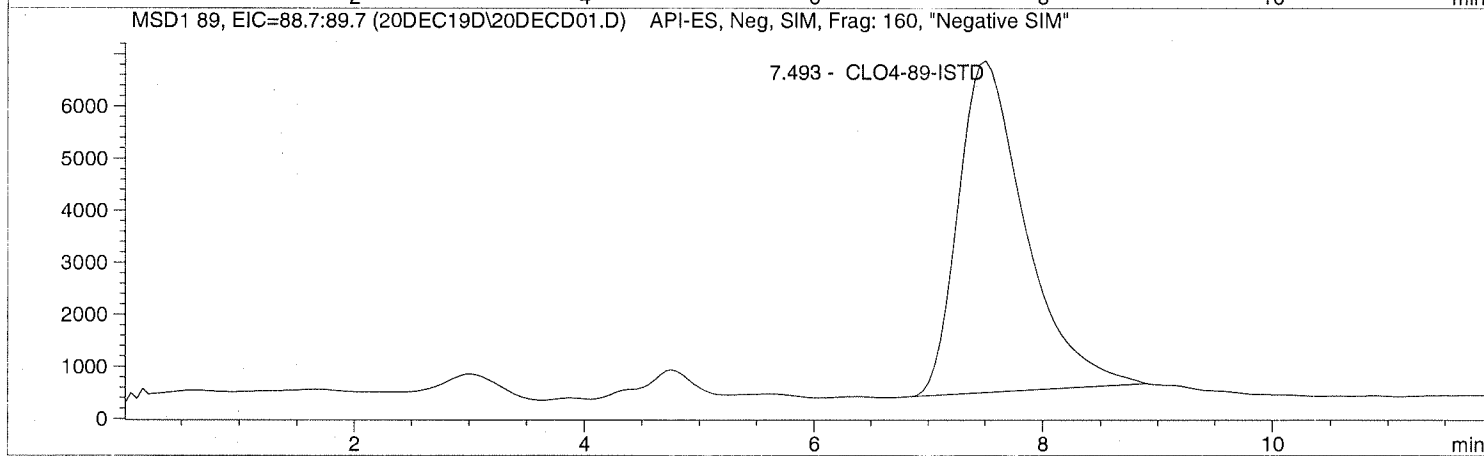
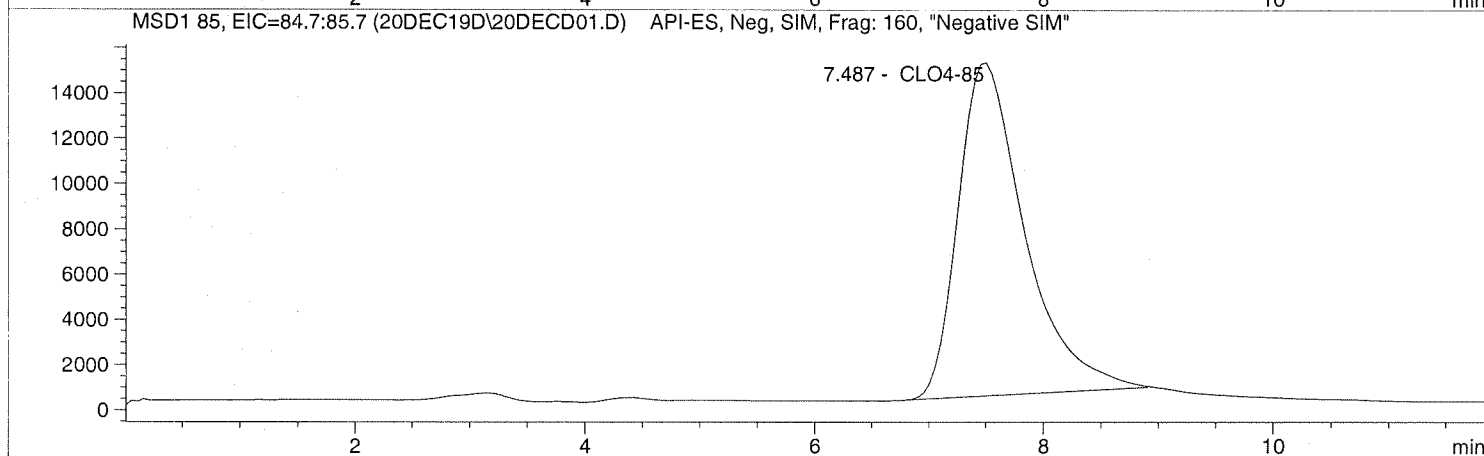
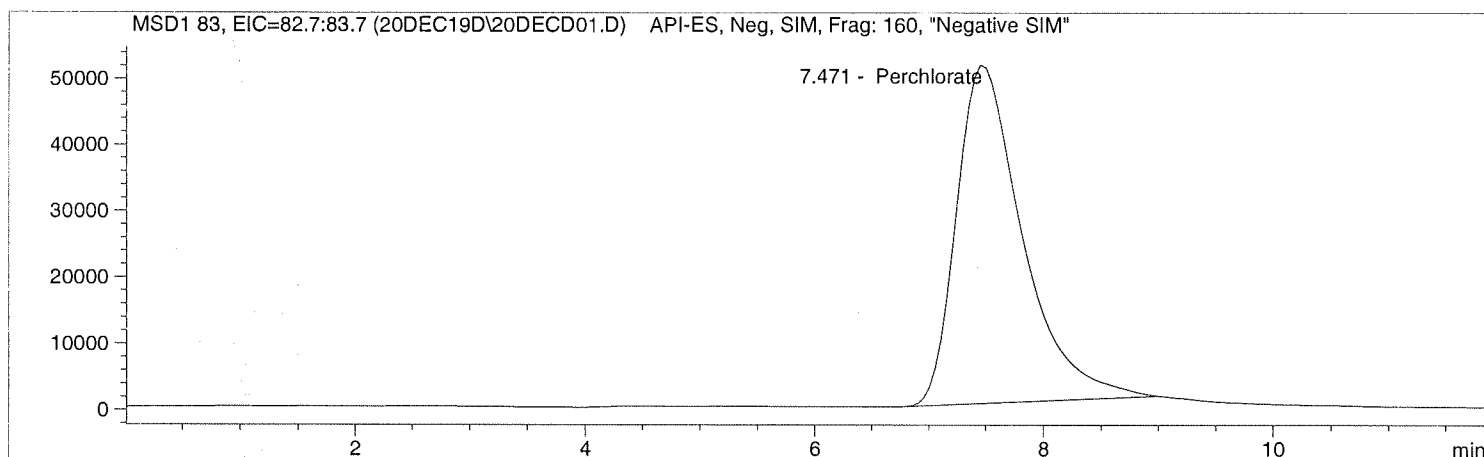
Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
====	=====	=====	=====	===	=====	=====	=====
1	Vial 71	689407	CCV@25	CLO4-AQN	1		Ctrl Samp
2	Vial 72	689408	QC@3.0	CLO4-AQN	1		Ctrl Samp
3	Vial 73	689410	ICS@3.0	CLO4-AQN	1		Ctrl Samp
4	Vial 74	689411	LMB	CLO4-AQN	1		Ctrl Samp
5	Vial 75	1934851001		CLO4-AQN	1		Sample
6	Vial 76	689412	348511S	CLO4-AQN	1		Sample
7	Vial 77	689413	348511D	CLO4-AQN	1		Sample
8	Vial 78	1934851002		CLO4-AQN	1		Sample
9	Vial 79	1934851003		CLO4-AQN	1		Sample
10	Vial 80	1934851004		CLO4-AQN	1		Sample
11	Vial 81	1934851005		CLO4-AQN	1		Sample
12	Vial 82	1934851006		CLO4-AQN	1		Sample
13	Vial 83	1934851007	100	CLO4-AQN	1		Sample
14	Vial 84	1935316001		CLO4-AQN	1		Sample
15	Vial 71	689414	CCV@25	CLO4-AQN	1		Ctrl Samp
16	Vial 85	1935316002		CLO4-AQN	1		Sample
17	Vial 86	1935316003		CLO4-AQN	1		Sample
18	Vial 87	1935316004		CLO4-AQN	1		Sample
19	Vial 88	1935343001		CLO4-AQN	1		Sample
20	Vial 89	1935343002		CLO4-AQN	1		Sample
21	Vial 90	1935343003		CLO4-AQN	1		Sample
22	Vial 91	1935343004	1K	CLO4-AQN	1		Sample
23	Vial 92	1935343005	10X	CLO4-AQN	1		Sample
24	Vial 93	1935343006	1K	CLO4-AQN	1		Sample
25	Vial 94	1934851006	10X	CLO4-AQN	1		Sample
26	Vial 71	689415	CCV@25	CLO4-AQN	1		Ctrl Samp

Data file: C:\HPCHEM\1\DATA\20DEC19D\20DECD01.D Sample Name: 689407 CCV@25

```
=====
Injection Date: 12/20/2019 13:20:20 Seq Line: 1
Sample Name: 689407 CCV@25 Location: Vial 71
Acq Operator: TNB Inj. No.: 1
Inj. Vol.: 35 µl
=====
```

```
Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45
```

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20DEC19D\20DEC19D01.D Sample Name: 689407 CCV@25

```

=====
Injection Date: 12/20/2019 13:20:20      Seq Line: 1
Sample Name: 689407 CCV@25              Location: Vial 71
Acq Operator: TNB                        Inj. No.: 1
                                           Inj. Vol.: 35 µl
=====

```

```

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By: Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 25.000
=====

```

```

=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.471	PBA	2041110.1	26.7089	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.487	PBA	593972.4	25.6104	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.493	PBA	259291.4	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

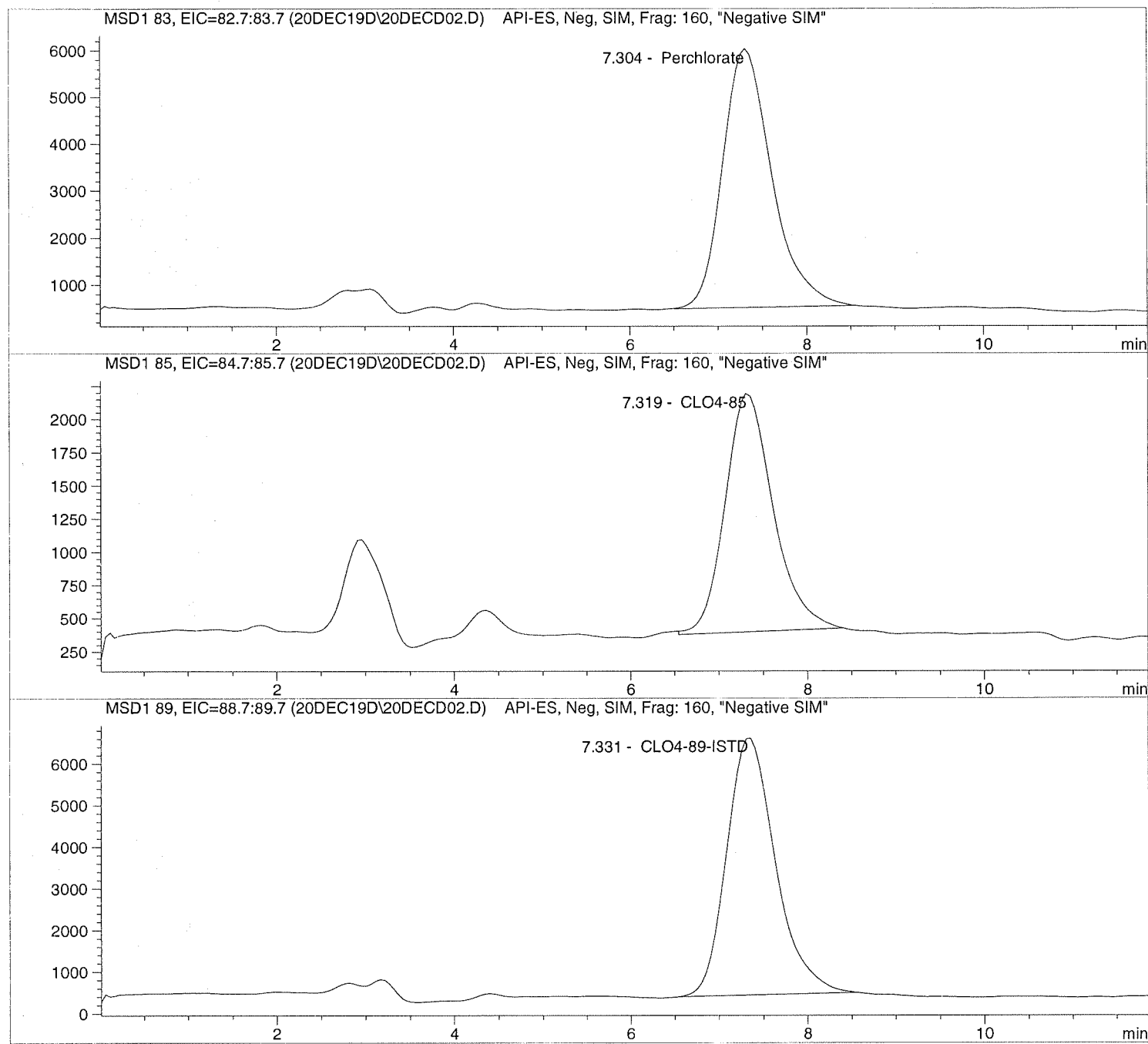
```

Data file: C:\HPCHEM\1\DATA\20DEC19D\20DECD02.D Sample Name: 689408 QC@3.0

```
=====
Injection Date: 12/20/2019 13:34:12      Seq Line:      2
Sample Name:    689408 QC@3.0             Location:      Vial 72
Acq Operator:   TNB                       Inj. No.:     1
                                           Inj. Vol.:    35 µl
=====
```

```
Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   11/5/2019 08:44:45
=====
```

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20DEC19D\20DECD02.D Sample Name: 689408 QC@3.0

```

=====
Injection Date: 12/20/2019 13:34:12      Seq Line:      2
Sample Name:    689408 QC@3.0            Location:      Vial 72
Acq Operator:   TNB                      Inj. No.:     1
                                           Inj. Vol.:    35 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   11/5/2019 08:44:45
=====

```

Perchlorate analysis

Sample Information

```

=====
Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  3.000
=====

```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.304	BBA	212146.7	3.3135	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.319	BBA	67607.4	3.3721	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.331	PBA	235841.7	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

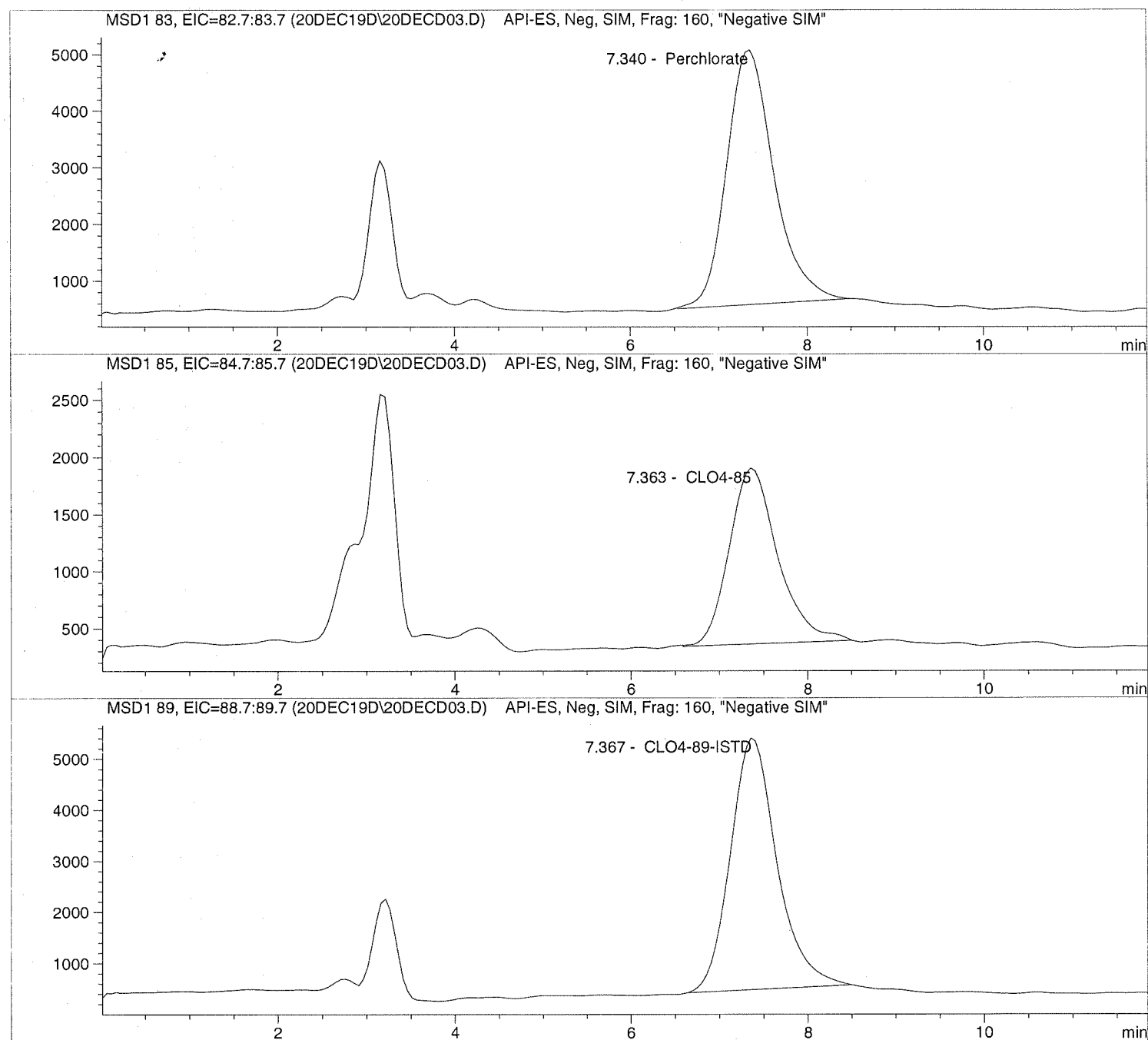
```


Data file: C:\HPCHEM\1\DATA\20DEC19D\20DEC19D03.D Sample Name: 689410 ICS@3.0

```
=====
Injection Date: 12/20/2019 13:48:05      Seq Line:          3
Sample Name:    689410 ICS@3.0           Location:          Vial 73
Acq Operator:   TNB                      Inj. No.:         1
                                           Inj. Vol.:        35 µl
=====
```

```
Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   11/5/2019 08:44:45
```

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20DEC19D\20DECD03.D Sample Name: 689410 ICS@3.0

=====
Injection Date: 12/20/2019 13:48:05 Seq Line: 3
Sample Name: 689410 ICS@3.0 Location: Vial 73
Acq Operator: TNB Inj. No.: 1
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis

=====
Sample Information
=====

Sorted By: Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 3.000

=====
LCMS Results
=====

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.340	BBA	166491.5	3.4048	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.363	BBA	58805.8	3.8543	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.367	BBA	180164.4	5.0000	CLO4-89-ISTD

=====
*** End of Report ***
=====

Data file: C:\HPCHEM\1\DATA\20DEC19D\20DEC19D04.D

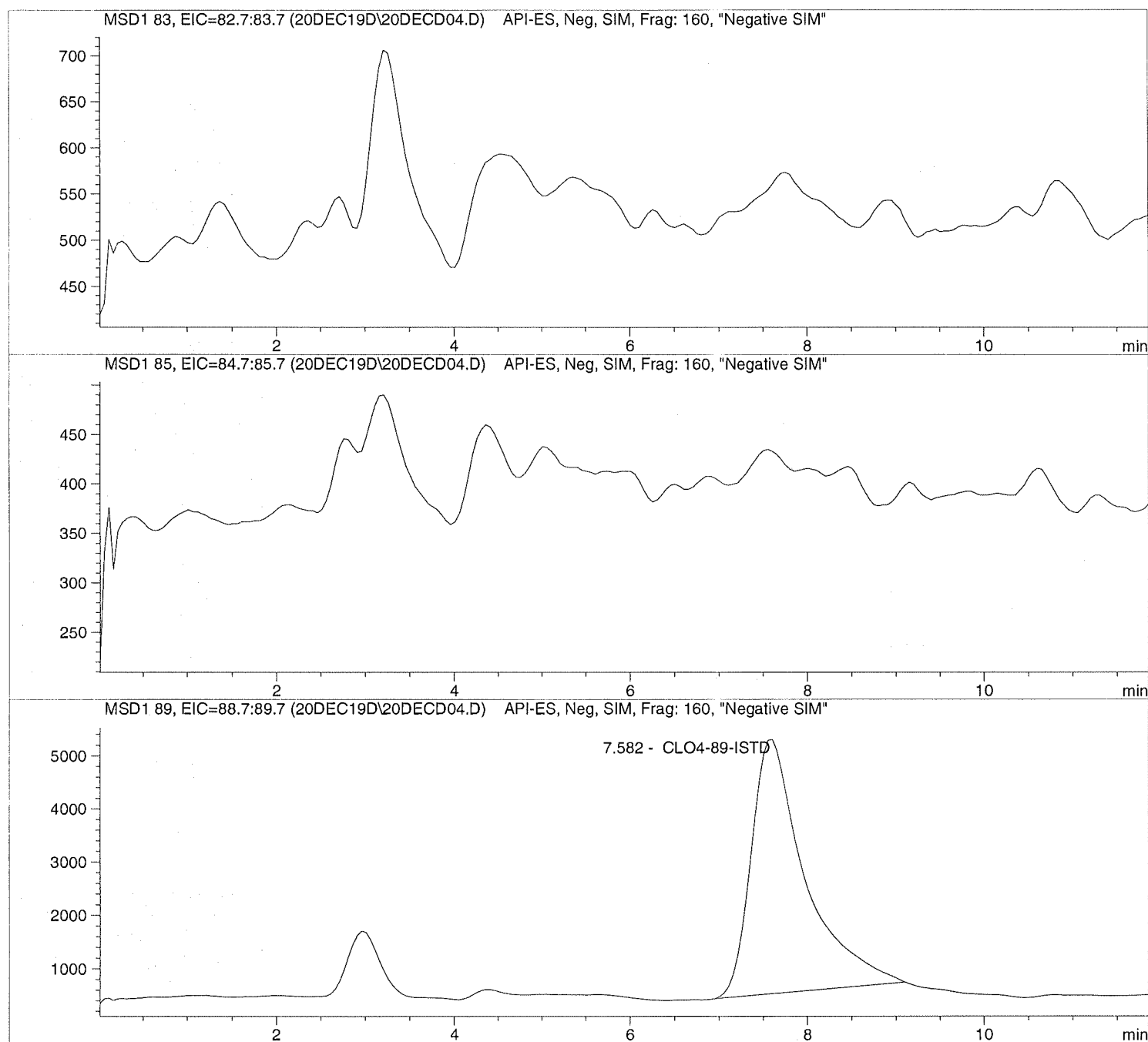
Sample Name: 689411 LMB

=====
Injection Date: 12/20/2019 14:02:00
Sample Name: 689411 LMB
Acq Operator: TNB

Seq Line: 4
Location: Vial 74
Inj. No.: 1
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20DEC19D\20DEC04.D Sample Name: 689411 LMB

```

=====
Injection Date: 12/20/2019 14:02:00      Seq Line:          4
Sample Name:    689411 LMB                Location:          Vial 74
Acq Operator:  TNB                       Inj. No.:         1
                                           Inj. Vol.:        35 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  0.000
=====

```

```

=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.582	PBA	203064.9	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

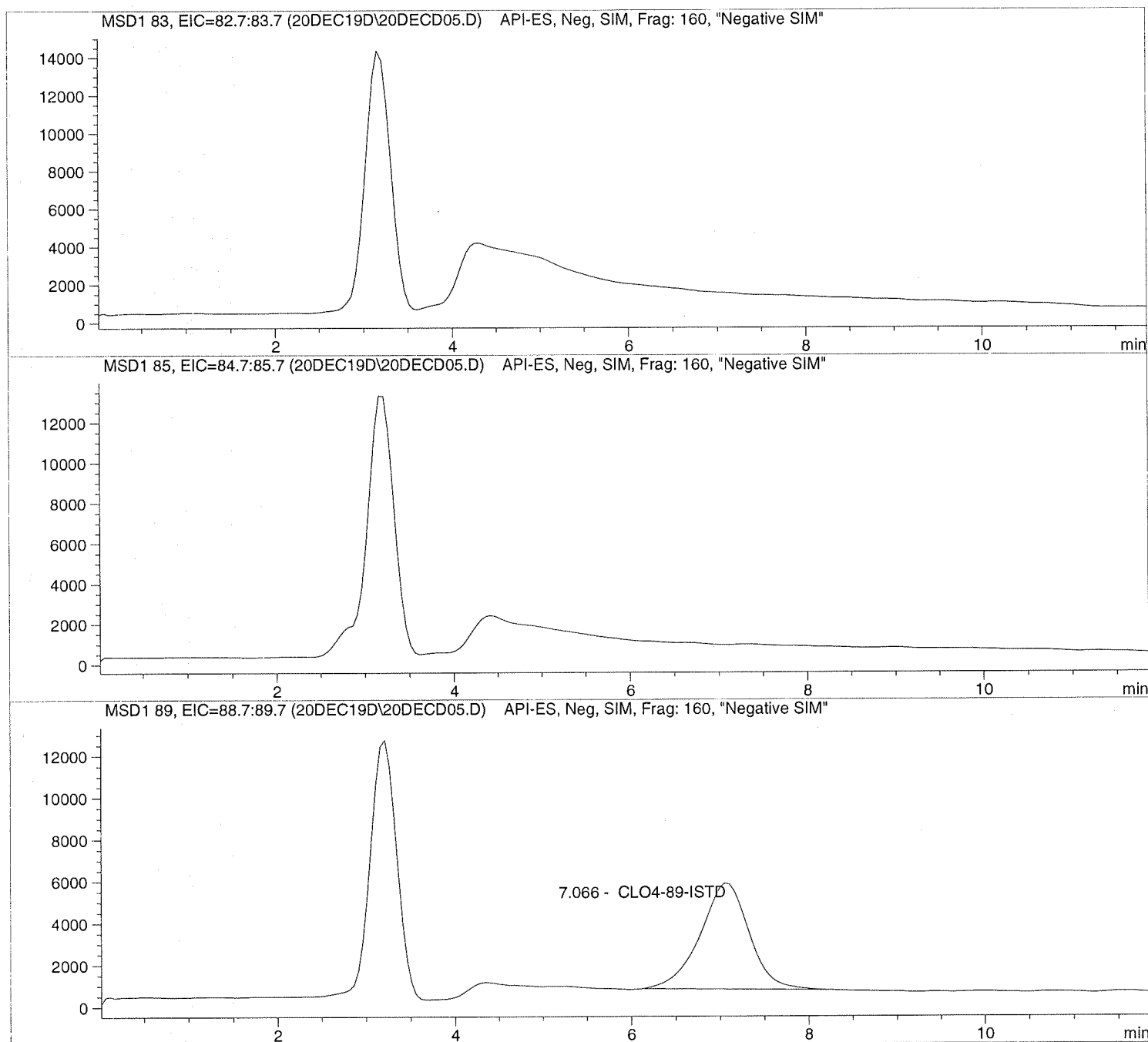
```

Data file: C:\HPCHEM\1\DATA\20DEC19D\20DEC05.D Sample Name: 1934851001

```
=====
Injection Date: 12/20/2019 14:15:58      Seq Line: 5
Sample Name: 1934851001                  Location: Vial 75
Acq Operator: TNB                         Inj. No.: 1
                                           Inj. Vol.: 35 µl
=====
```

```
Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45
```

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20DEC19D\20DECD05.D

Sample Name: 1934851001

```

=====
Injection Date: 12/20/2019 14:15:58      Seq Line:          5
Sample Name:   1934851001                Location:          Vial 75
Acq Operator:  TNB                       Inj. No.:         1
                                           Inj. Vol.:        35 µl
=====

```

```

Acq. Method:   CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:  11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:    1.000000
Dilution:      1.000000
Sample Amount: 0.000
=====

```

```

=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.066	PBA	195221.4	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\20DEC19D\20DECD06.D

Sample Name: 689412 348511S

Injection Date: 12/20/2019 14:29:51

Seq Line: 6

Sample Name: 689412 348511S

Location: Vial 76

Acq Operator: TNB

Inj. No.: 1

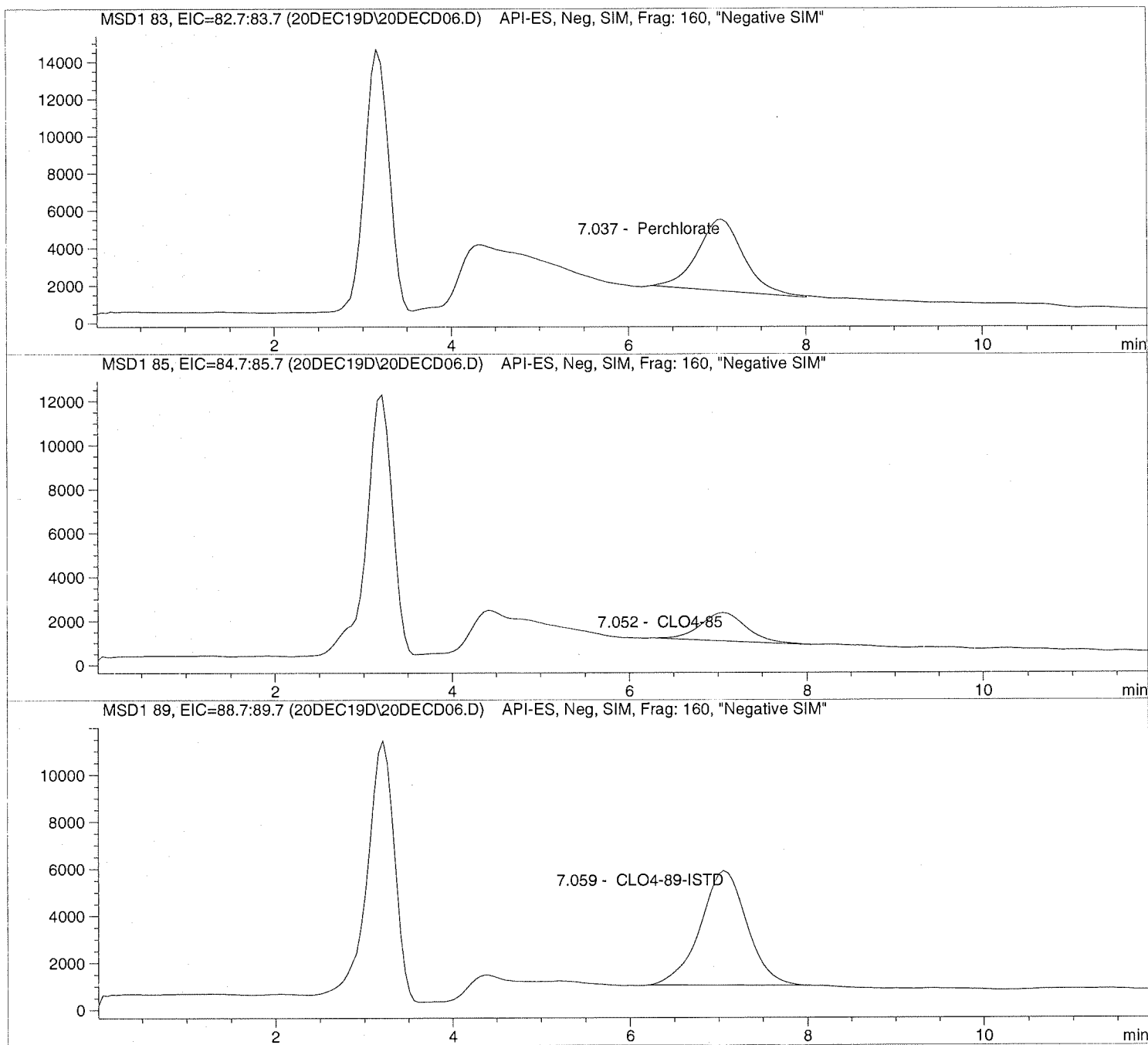
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M

Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20DEC19D\20DEC06.D Sample Name: 689412 348511S

```

=====
Injection Date: 12/20/2019 14:29:51      Seq Line: 6
Sample Name:    689412 348511S           Location:  Vial 76
Acq Operator:   TNB                      Inj. No.: 1
                                           Inj. Vol.: 35 µl

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   11/5/2019 08:44:45

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:    1.000000
Dilution:      1.000000
Sample Amount: 0.000

```

```

=====
                          LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.037	PBA	138252.7	2.8383	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.052	PBA	46637.2	3.0527	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.059	PBA	179079.6	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***

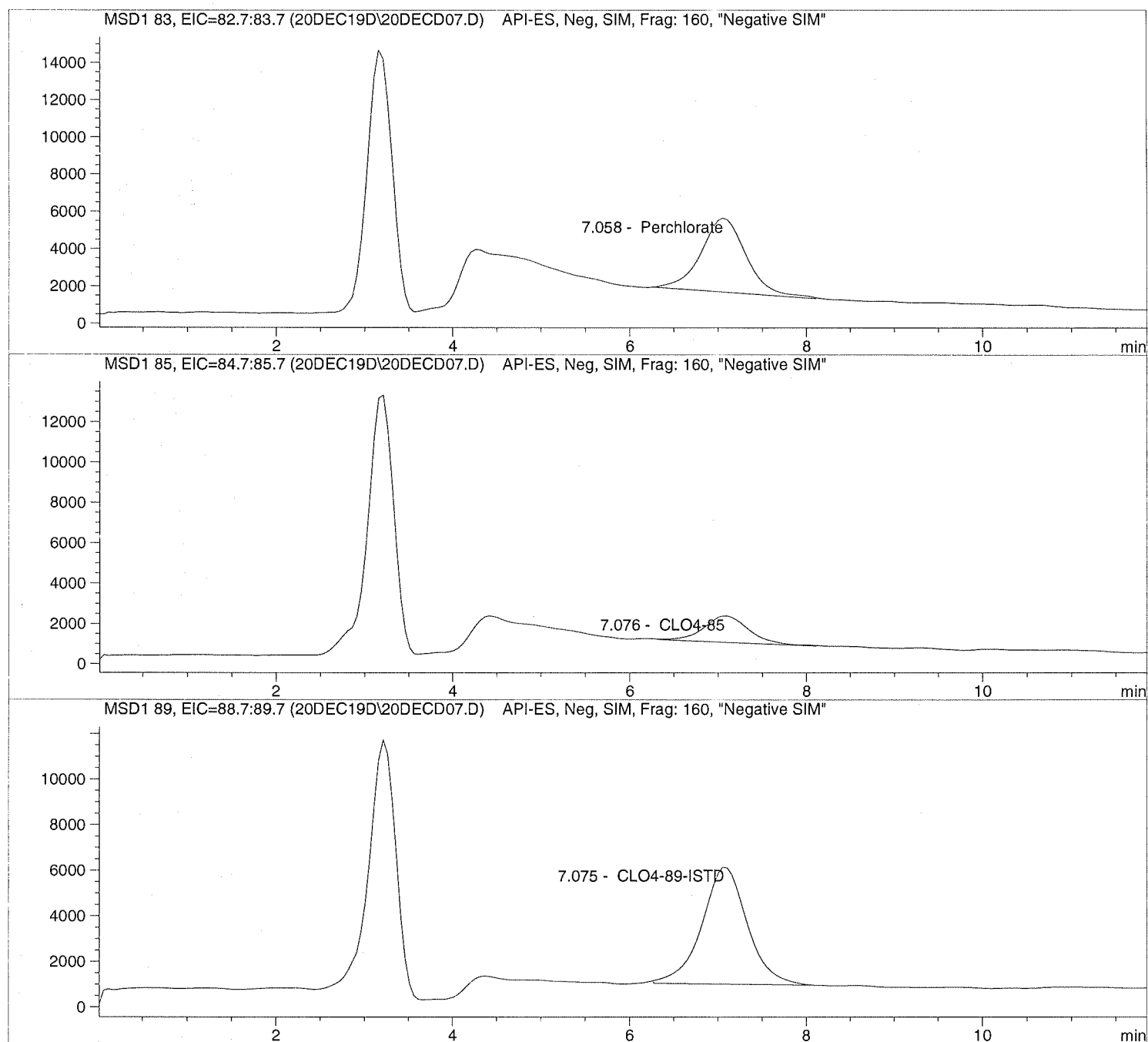
```


Data file: C:\HPCHEM\1\DATA\20DEC19D\20DECD07.D Sample Name: 689413 348511D

```
=====
Injection Date: 12/20/2019 14:43:48      Seq Line: 7
Sample Name: 689413 348511D             Location: Vial 77
Acq Operator: TNB                       Inj. No.: 1
                                           Inj. Vol.: 35 µl
=====
```

```
Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45
```

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20DEC19D\20DEC07.D Sample Name: 689413 348511D

```

=====
Injection Date: 12/20/2019 14:43:48      Seq Line: 7
Sample Name: 689413 348511D            Location: Vial 77
Acq Operator: TNB                      Inj. No.: 1
                                           Inj. Vol.: 35 µl
=====

```

```

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By: Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 0.000
=====

```

```

=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.058	PBA	140128.3	2.8119	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.076	BBA	46020.6	2.9403	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.075	BBA	183191.7	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\20DEC19D\20DECD08.D

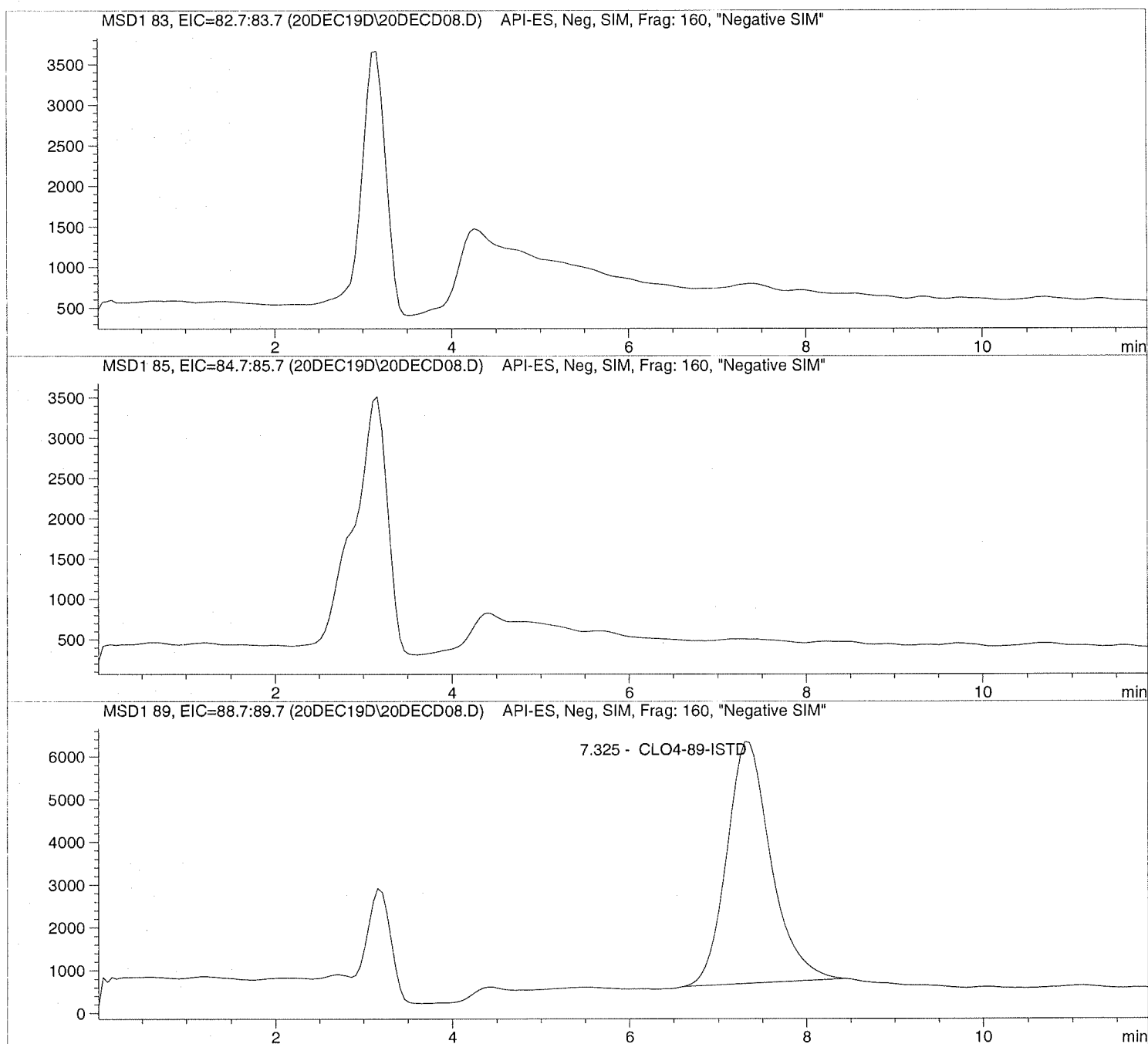
Sample Name: 1934851002

Injection Date: 12/20/2019 14:57:42
Sample Name: 1934851002
Acq Operator: TNB

Seq Line: 8
Location: Vial 78
Inj. No.: 1
Inj. Vol.: 35 μ l

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20DEC19D\20DECD08.D

Sample Name: 1934851002

```

=====
Injection Date: 12/20/2019 14:57:42      Seq Line:      8
Sample Name:   1934851002                Location:      Vial 78
Acq Operator:  TNB                       Inj. No.:     1
                                           Inj. Vol.:    35 µl
=====

```

```

Acq. Method:   CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:  11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:    1.000000
Dilution:      1.000000
Sample Amount: 0.000
=====

```

```

=====
                          LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.325	PBA	196897.1	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\20DEC19D\20DECD09.D

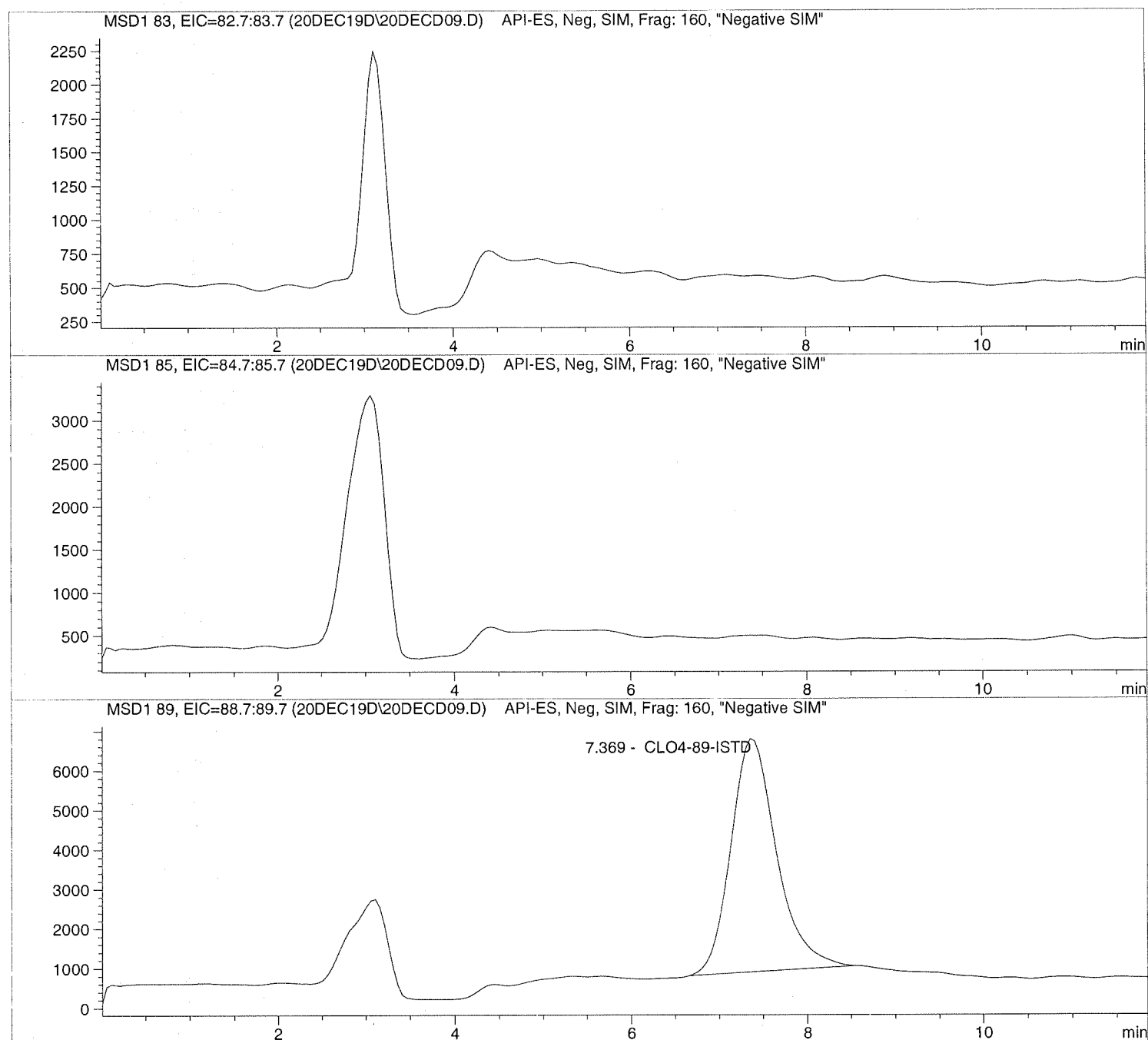
Sample Name: 1934851003

=====
Injection Date: 12/20/2019 15:11:34
Sample Name: 1934851003
Acq Operator: TNB

Seq Line: 9
Location: Vial 79
Inj. No.: 1
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20DEC19D\20DECD09.D Sample Name: 1934851003

```

=====
Injection Date: 12/20/2019 15:11:34      Seq Line:          9
Sample Name:    1934851003                Location:         Vial 79
Acq Operator:   TNB                       Inj. No.:        1
                                           Inj. Vol.:       35 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  0.000
=====

```

```

=====
                          LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.369	PBA	213267.4	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\20DEC19D\20DECD10.D

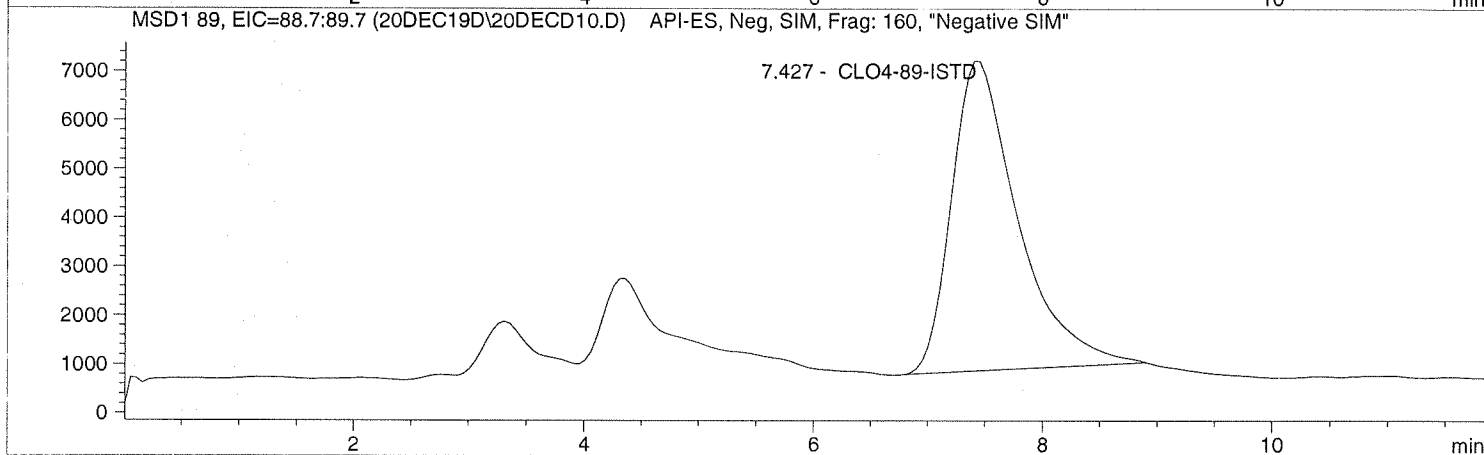
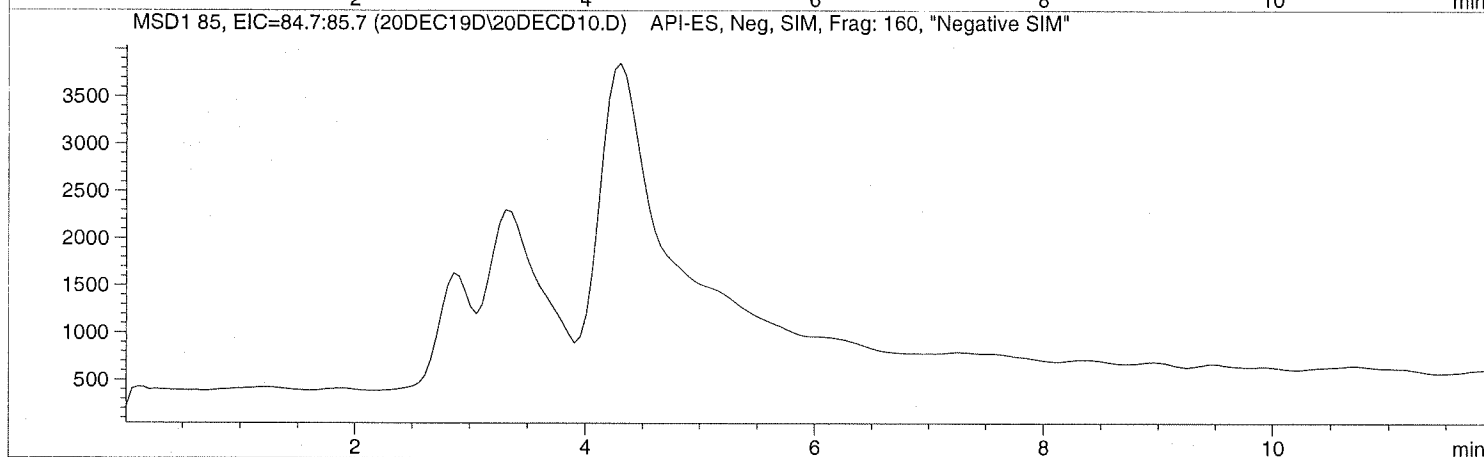
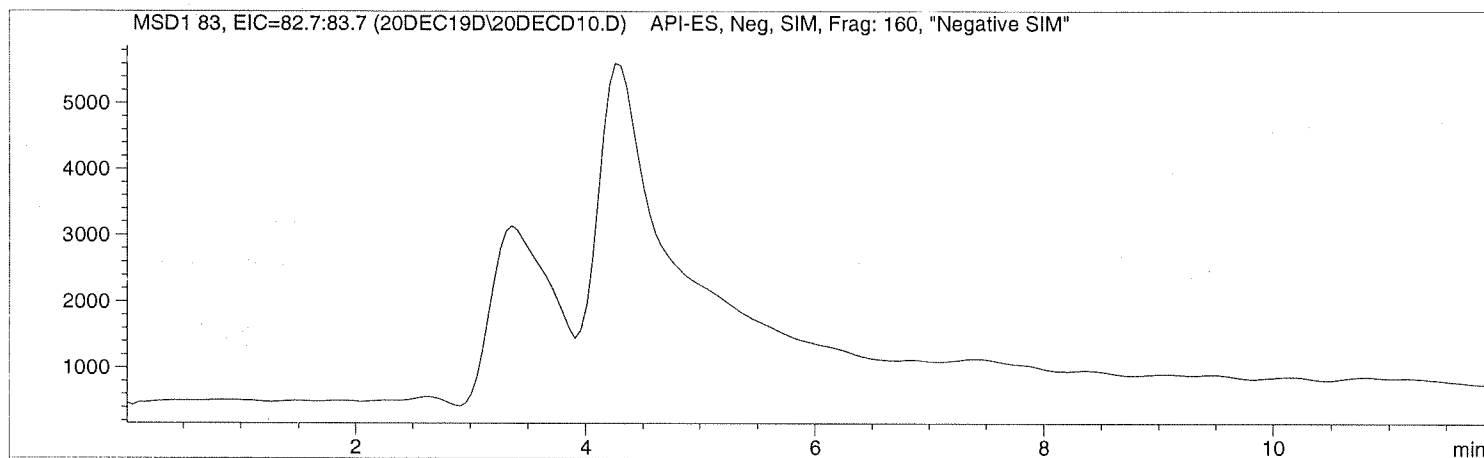
Sample Name: 1934851004

Injection Date: 12/20/2019 15:25:34
Sample Name: 1934851004
Acq Operator: TNB

Seq Line: 10
Location: Vial 80
Inj. No.: 1
Inj. Vol.: 35 μ l

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20DEC19D\20DECD10.D

Sample Name: 1934851004

```

=====
Injection Date: 12/20/2019 15:25:34      Seq Line:          10
Sample Name:   1934851004                Location:         Vial 80
Acq Operator:  TNB                       Inj. No.:        1
                                           Inj. Vol.:       35 µl
=====

```

```

Acq. Method:   CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:  11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:    1.000000
Dilution:      1.000000
Sample Amount: 0.000
=====

```

```

=====
                          LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.427	PBA	255177.9	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```


Data file: C:\HPCHEM\1\DATA\20DEC19D\20DECD11.D

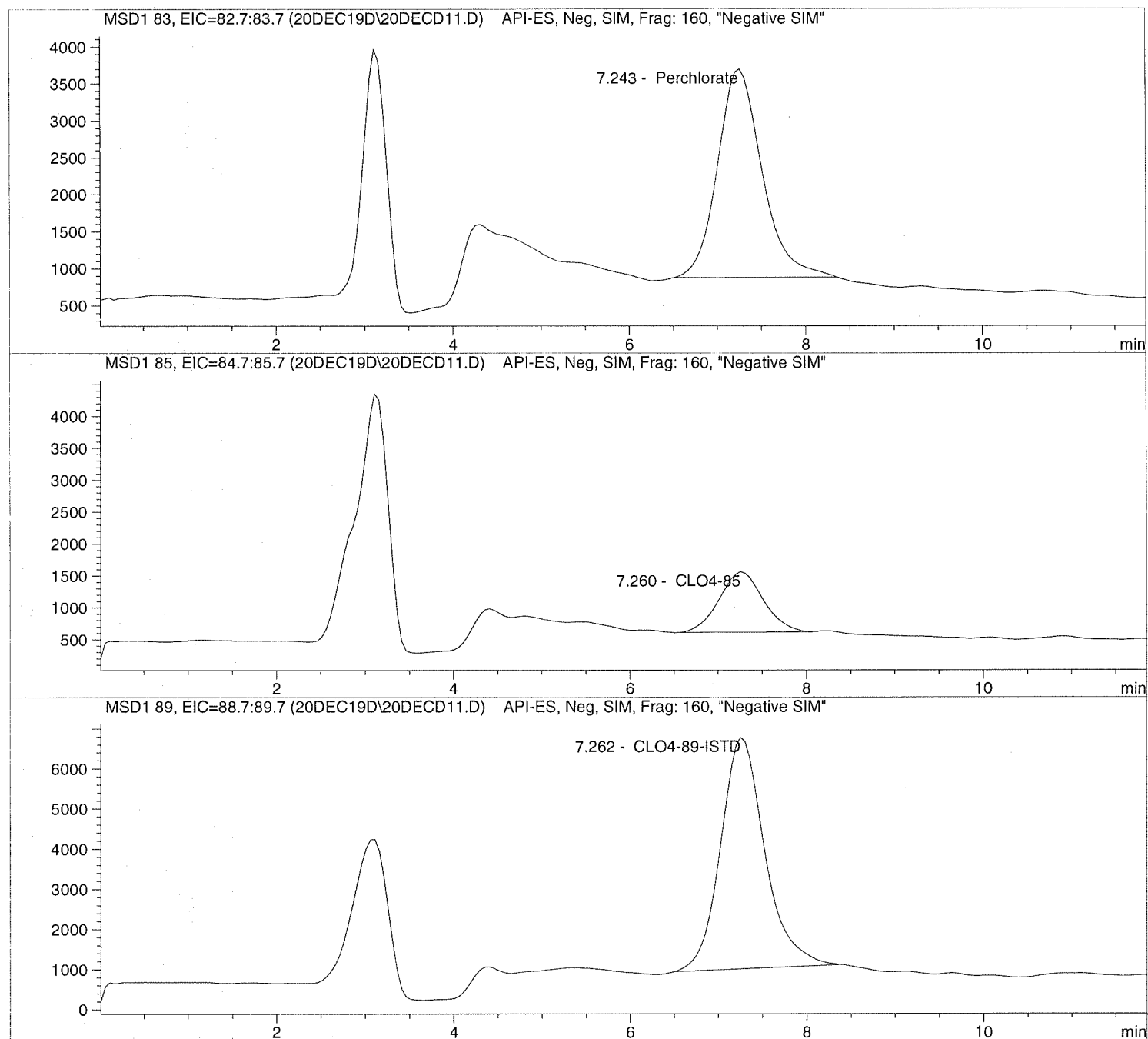
Sample Name: 1934851005

Injection Date: 12/20/2019 15:39:24
Sample Name: 1934851005
Acq Operator: TNB

Seq Line: 11
Location: Vial 81
Inj. No.: 1
Inj. Vol.: 35 μ l

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20DEC19D\20DEC11.D

Sample Name: 1934851005

```

=====
Injection Date: 12/20/2019 15:39:24      Seq Line:          11
Sample Name:    1934851005              Location:         Vial 81
Acq Operator:   TNB                     Inj. No.:        1
                                           Inj. Vol.:       35 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:      1.000000
Sample Amount:  0.000
=====

```

```

=====
                          LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.243	PBA	98345.9	1.7879	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.260	PBA	32799.0	1.8724	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.262	PBA	199853.9	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\20DEC19D\20DECD12.D

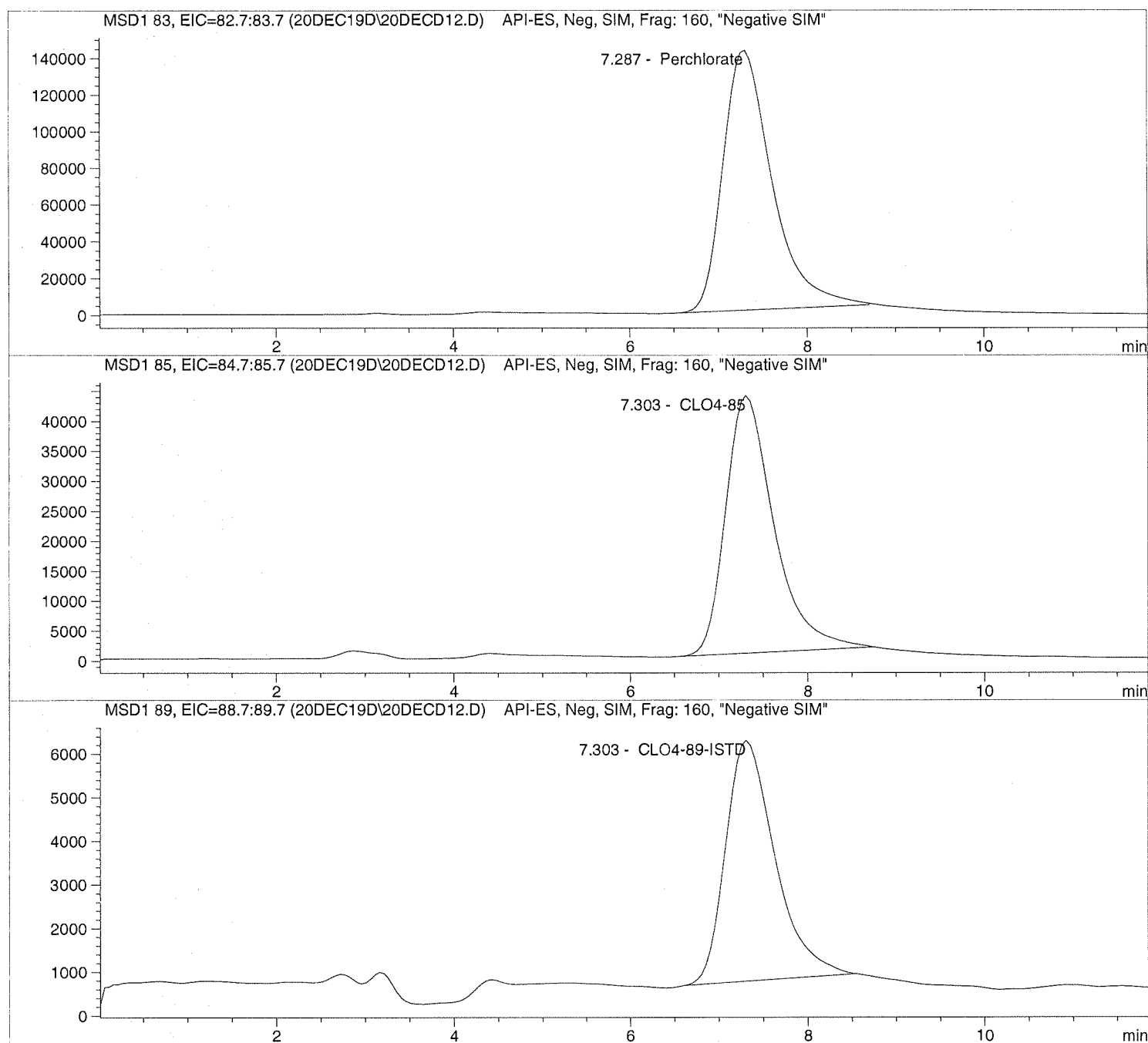
Sample Name: 1934851006

Injection Date: 12/20/2019 15:53:16
Sample Name: 1934851006
Acq Operator: TNB

Seq Line: 12
Location: Vial 82
Inj. No.: 1
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20DEC19D\20DEC12.D Sample Name: 1934851006

```

=====
Injection Date: 12/20/2019 15:53:16      Seq Line:          12
Sample Name:   1934851006                Location:          Vial 82
Acq Operator:  TNB                       Inj. No.:         1
                                           Inj. Vol.:        35 µl

```

```

Acq. Method:   CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:  11/5/2019 08:44:45

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:    1.000000
Dilution:      1.000000
Sample Amount: 0.000

```

```

=====
                          LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.287	PBA	5442572.0	72.5354	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.303	PBA	1626533.5	72.0976	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.303	PBA	213698.1	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***

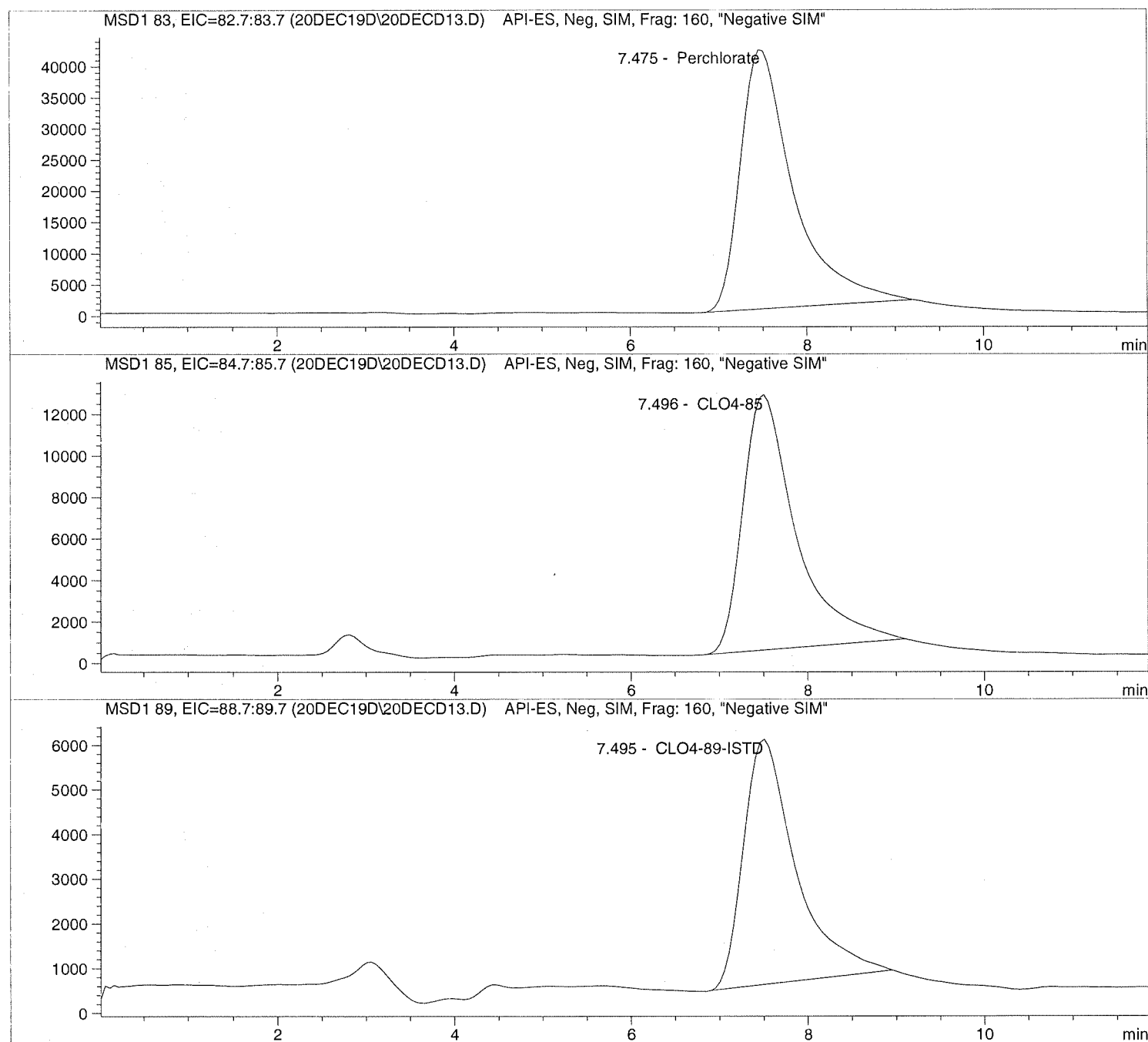
```

Data file: C:\HPCHEM\1\DATA\20DEC19D\20DECD13.D Sample Name: 1934851007 100

=====
Injection Date: 12/20/2019 16:07:07 Seq Line: 13
Sample Name: 1934851007 100 Location: Vial 83
Acq Operator: TNB Inj. No.: 1
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20DEC19D\20DECD13.D Sample Name: 1934851007 100

```
=====
Injection Date: 12/20/2019 16:07:07      Seq Line:          13
Sample Name:    1934851007 100           Location:          Vial 83
Acq Operator:   TNB                      Inj. No.:         1
                                           Inj. Vol.:       35 µl
=====
```

```
Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   11/5/2019 08:44:45
```

Perchlorate analysis

Sample Information

```
Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:    1.000000
Dilution:      100.000000
Sample Amount: 0.000
```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.475	PBA	1739525.5	2605.9612	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.496	PBA	514969.0	2537.4708	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.495	PBA	227091.5	500.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\20DEC19D\20DECD14.D

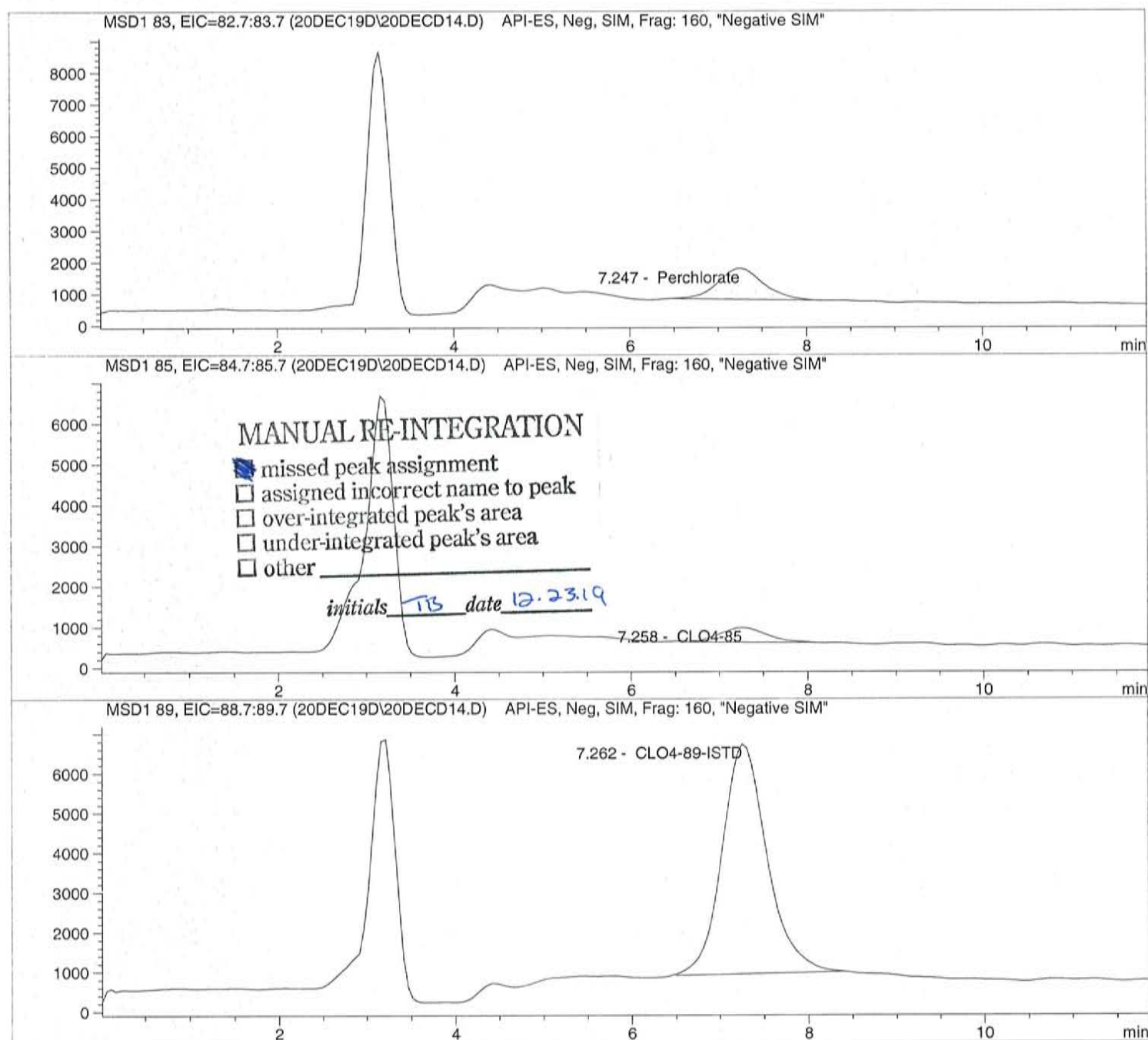
Sample Name: 1935316001

Injection Date: 12/20/2019 16:20:57
 Sample Name: 1935316001
 Acq Operator: TNB

Seq Line: 14
 Location: Vial 84
 Inj. No.: 1
 Inj. Vol.: 35 μ l

Acq. Method: CLO4-AQN.M
 Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
 Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20DEC19D\20DEC14.D Sample Name: 1935316001

```

=====
Injection Date: 12/20/2019 16:20:57      Seq Line:      14
Sample Name:   1935316001                Location:      Vial 84
Acq Operator:  TNB                       Inj. No.:     1
                                           Inj. Vol.:    35 µl
=====

```

```

Acq. Method:   CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:  11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  0.000
=====

```

```

=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.247	PBA	35246.8	0.5749	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.258	MM	13171.3	0.6371	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.262	BBA	204617.7	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```


Data file: C:\HPCHEM\1\DATA\20DEC19D\20DECD15.D

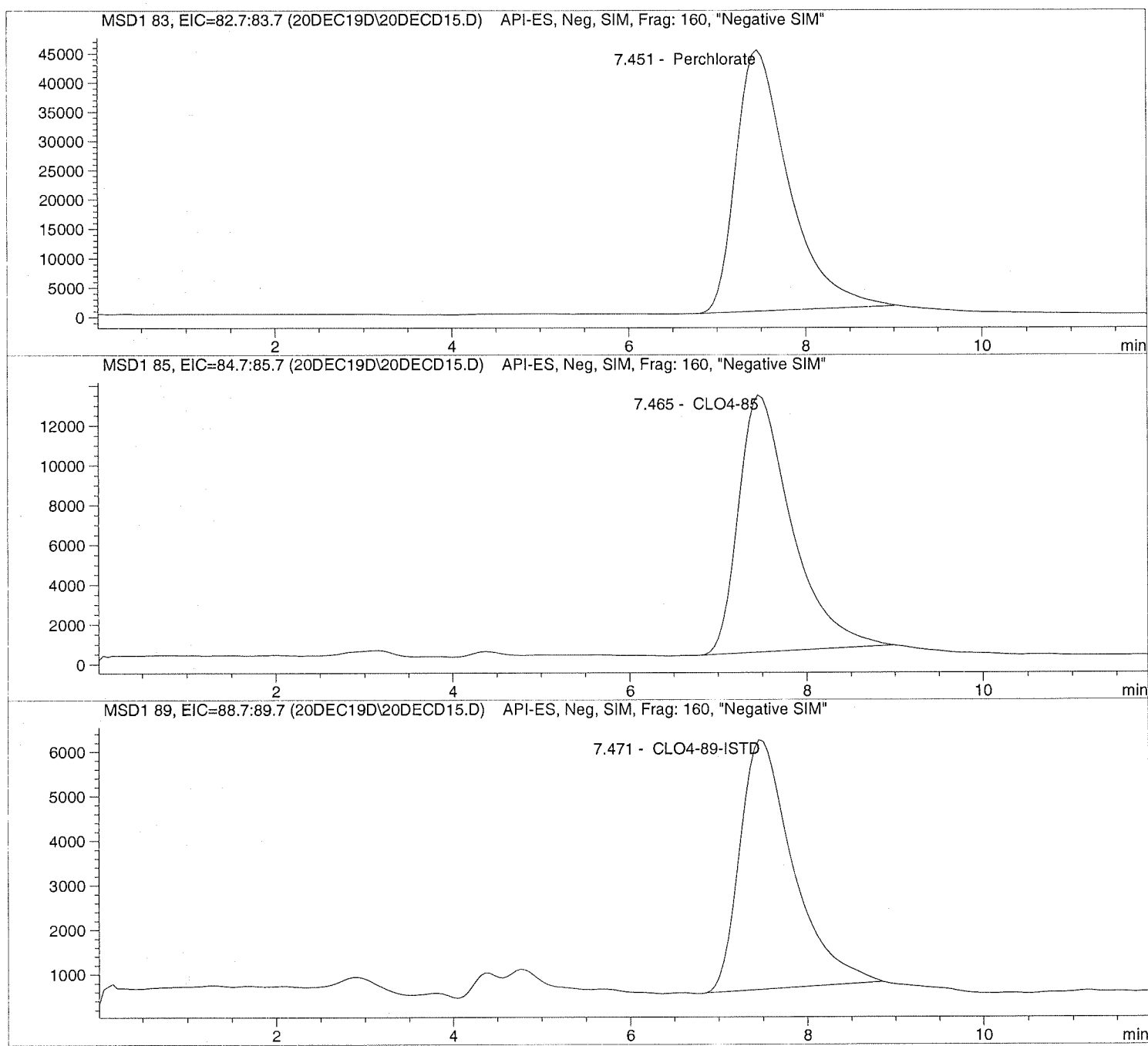
Sample Name: 689414 CCV@25

Injection Date: 12/20/2019 16:34:50
Sample Name: 689414 CCV@25
Acq Operator: TNB

Seq Line: 15
Location: Vial 71
Inj. No.: 1
Inj. Vol.: 35 μ l

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20DEC19D\20DEC15.D Sample Name: 689414 CCV@25

```

=====
Injection Date: 12/20/2019 16:34:50      Seq Line:      15
Sample Name:   689414   CCV@25          Location:      Vial 71
Acq Operator:  TNB                Inj. No.:     1
                                           Inj. Vol.:    35 µl
  
```

```

Acq. Method:   CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:  11/5/2019 08:44:45
  
```

Perchlorate analysis

=====
Sample Information
=====

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:    1.000000
Dilution:      1.000000
Sample Amount: 25.000
  
```

=====
LCMS Results
=====

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.451	PBA	1840359.7	26.7545	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.465	PBA	538678.8	25.7913	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.471	PBA	233347.4	5.0000	CLO4-89-ISTD

=====
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\20DEC19D\20DEC16.D

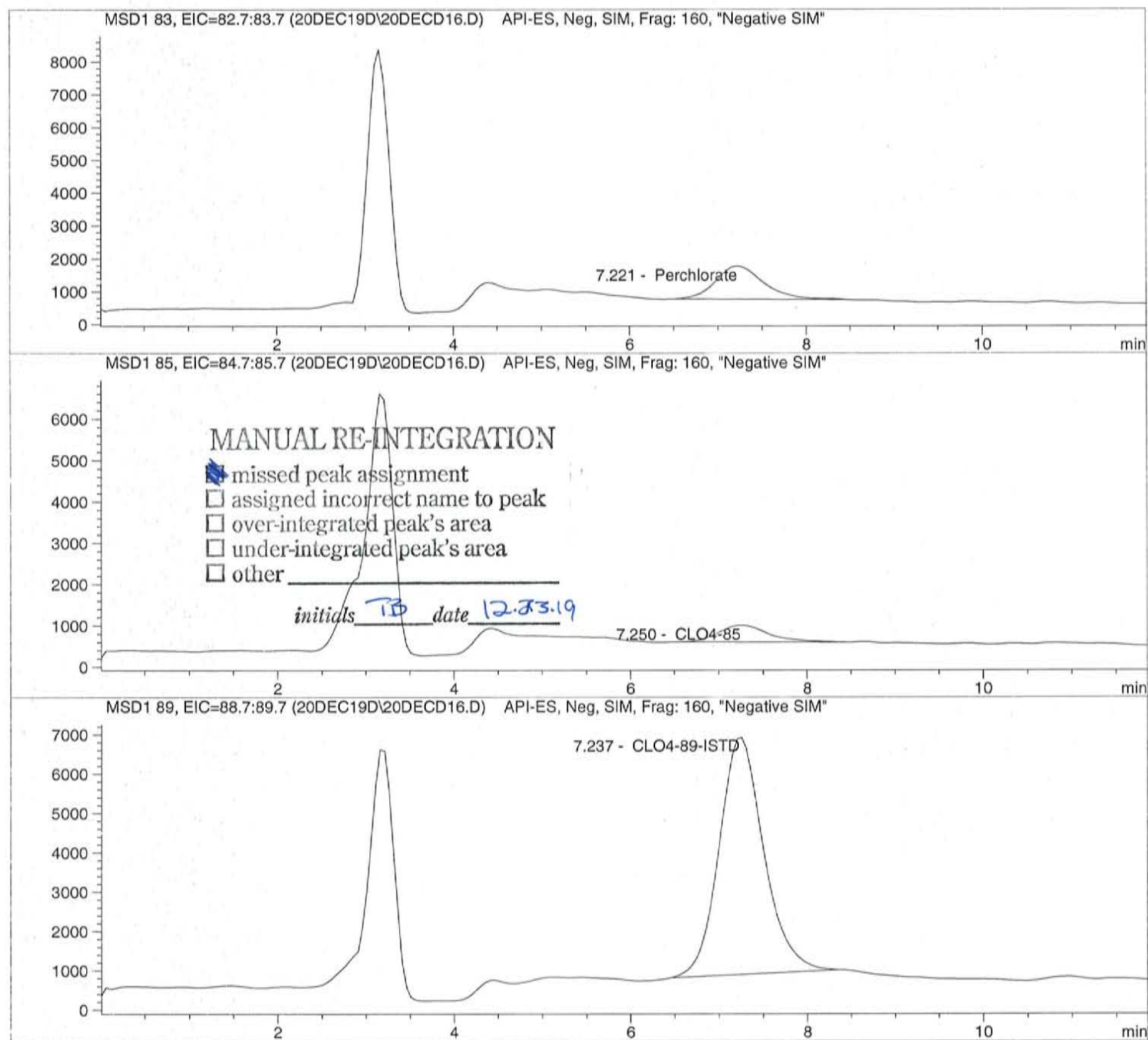
Sample Name: 1935316002

=====
 Injection Date: 12/20/2019 16:48:43
 Sample Name: 1935316002
 Acq Operator: TNB

Seq Line: 16
 Location: Vial 85
 Inj. No.: 1
 Inj. Vol.: 35 μ l

Acq. Method: CLO4-AQN.M
 Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
 Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20DEC19D\20DECD16.D Sample Name: 1935316002

```

=====
Injection Date: 12/20/2019 16:48:43      Seq Line:          16
Sample Name:   1935316002                Location:          Vial 85
Acq Operator:  TNB                       Inj. No.:         1
                                           Inj. Vol.:       35 µl
=====

```

```

Acq. Method:   CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:  11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:    1.000000
Dilution:     1.000000
Sample Amount: 0.000
=====

```

```

=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.221	PBA	37711.6	0.6019	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.250	MM	16316.8	0.8016	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.237	PBA	210291.4	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\20DEC19D\20DECD17.D

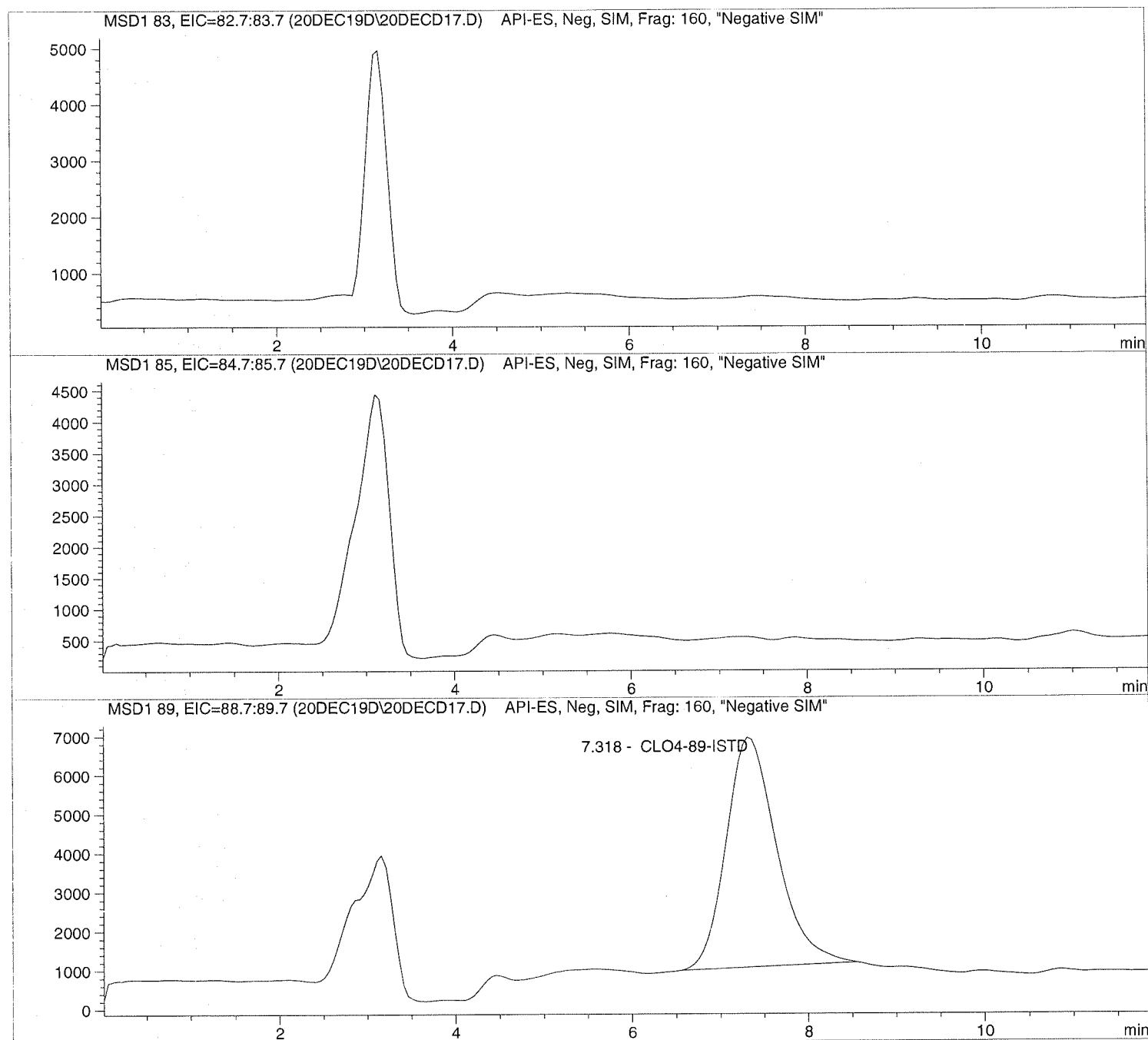
Sample Name: 1935316003

Injection Date: 12/20/2019 17:02:35
Sample Name: 1935316003
Acq Operator: TNB

Seq Line: 17
Location: Vial 86
Inj. No.: 1
Inj. Vol.: 35 μ l

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20DEC19D\20DECD17.D

Sample Name: 1935316003

```

=====
Injection Date: 12/20/2019 17:02:35      Seq Line:          17
Sample Name:   1935316003                Location:          Vial 86
Acq Operator:  TNB                       Inj. No.:         1
                                           Inj. Vol.:        35 µl
=====

```

```

Acq. Method:   CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:  11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:           Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:         1.000000
Dilution:           1.000000
Sample Amount:      0.000
=====

```

```

=====
                          LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.318	PBA	235611.6	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\20DEC19D\20DEC18.D

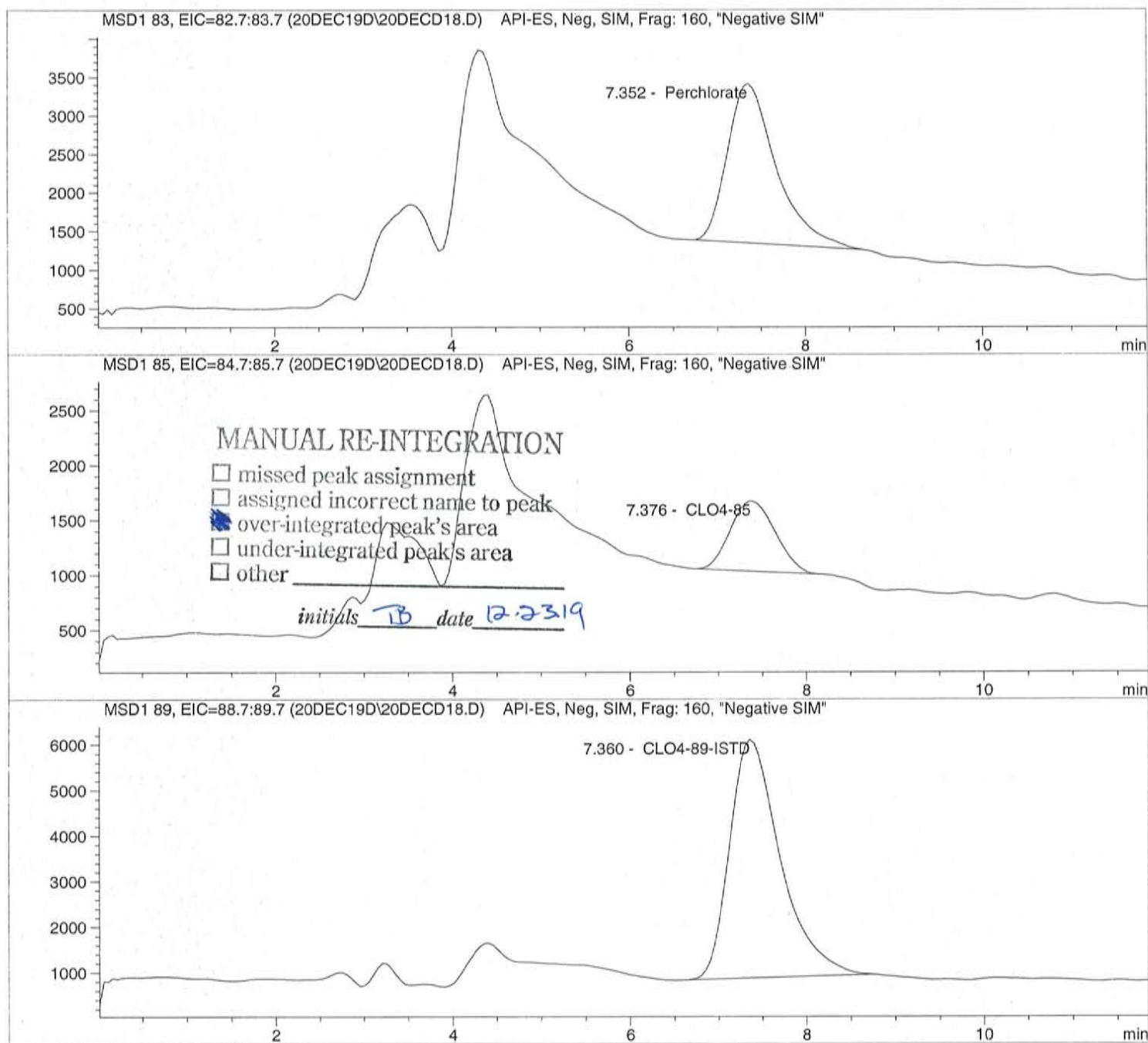
Sample Name: 1935316004

Injection Date: 12/20/2019 17:16:32
Sample Name: 1935316004
Acq Operator: TNB

Seq Line: 18
Location: Vial 87
Inj. No.: 1
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20DEC19D\20DECD18.D

Sample Name: 1935316004

```

=====
Injection Date: 12/20/2019 17:16:32      Seq Line:          18
Sample Name:   1935316004                Location:         Vial 87
Acq Operator:  TNB                       Inj. No.:        1
                                           Inj. Vol.:       35 µl
=====

```

```

Acq. Method:   CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:  11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:    1.000000
Dilution:      1.000000
Sample Amount: 0.000
=====

```

```

=====
                          LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.352	PBA	79516.8	1.3684	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.376	MM	22677.9	1.1875	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.360	PBA	208671.3	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```


Data file: C:\HPCHEM\1\DATA\20DEC19D\20DEC19.D

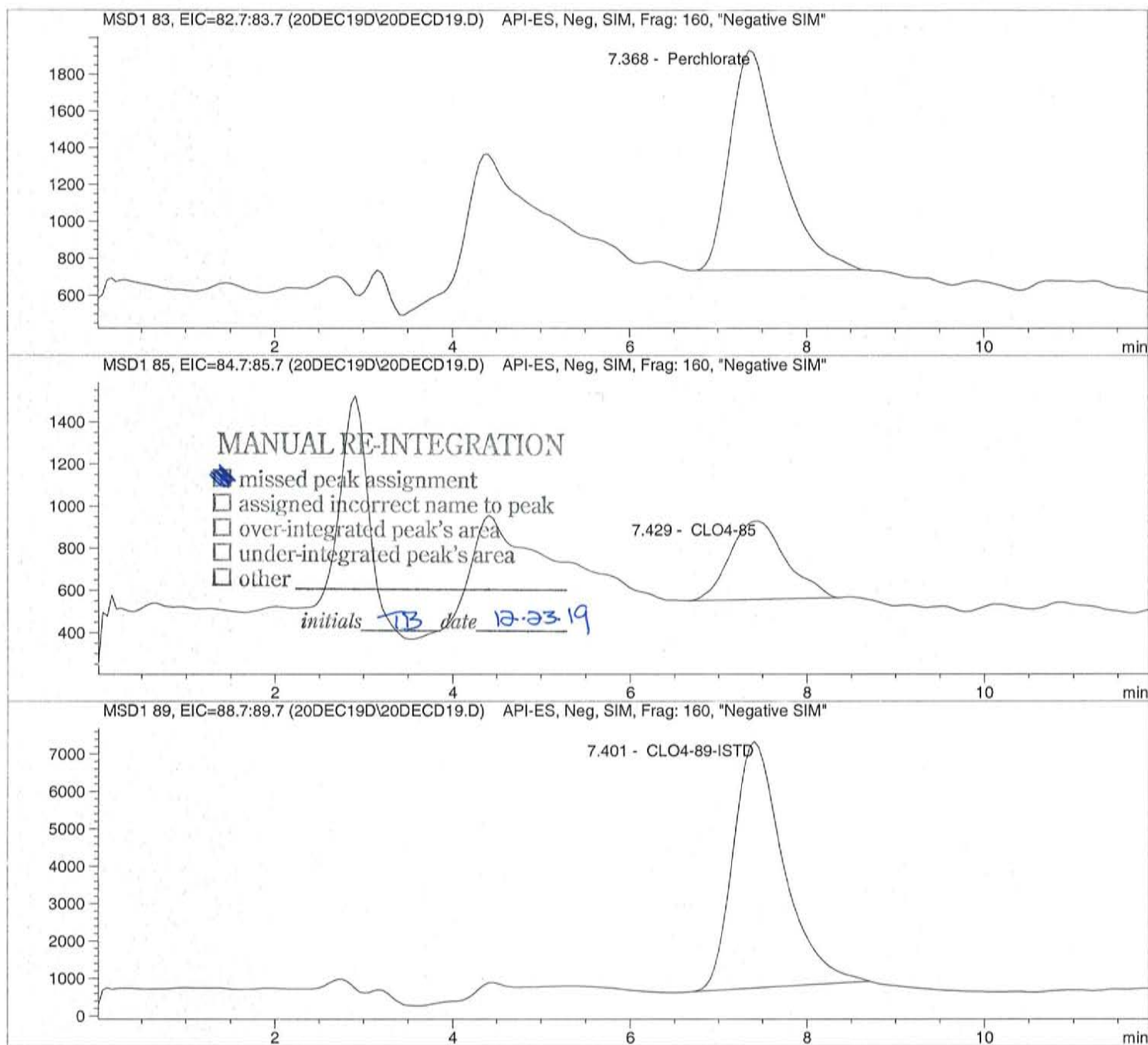
Sample Name: 1935343001

=====
Injection Date: 12/20/2019 17:30:23
Sample Name: 1935343001
Acq Operator: TNB

Seq Line: 19
Location: Vial 88
Inj. No.: 1
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20DEC19D\20DEC19.D Sample Name: 1935343001

```

=====
Injection Date: 12/20/2019 17:30:23      Seq Line:          19
Sample Name:   1935343001                Location:          Vial 88
Acq Operator:  TNB                       Inj. No.:         1
                                           Inj. Vol.:       35 µl
=====

```

```

Acq. Method:   CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:  11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:          Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:        1.000000
Dilution:          1.000000
Sample Amount:     0.000
=====

```

```

=====
                          LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.368	PBA	47484.7	0.6123	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.429	MM	16333.7	0.6154	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.401	PBA	260797.0	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\20DEC19D\20DECD20.D

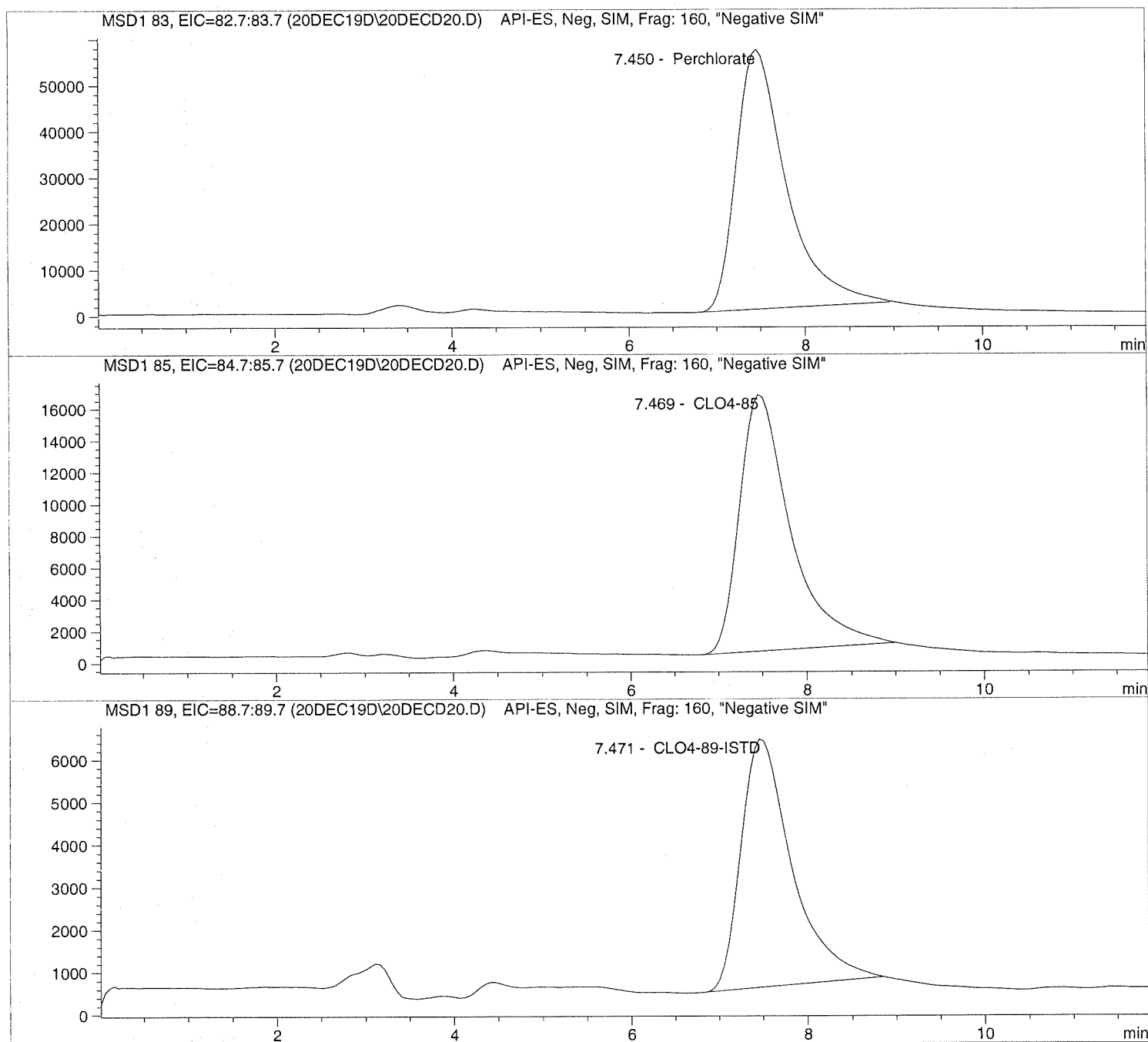
Sample Name: 1935343002

=====
Injection Date: 12/20/2019 17:44:18
Sample Name: 1935343002
Acq Operator: TNB

Seq Line: 20
Location: Vial 89
Inj. No.: 1
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20DEC19D\20DECD20.D

Sample Name: 1935343002

```

=====
Injection Date: 12/20/2019 17:44:18      Seq Line: 20
Sample Name:    1935343002                Location:  Vial 89
Acq Operator:   TNB                       Inj. No.: 1
                                           Inj. Vol.: 35 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  0.000
=====

```

```

=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.450	PBA	2218208.3	31.6741	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.469	PBA	646837.8	30.4960	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.471	PBA	232847.2	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\20DEC19D\20DECD21.D

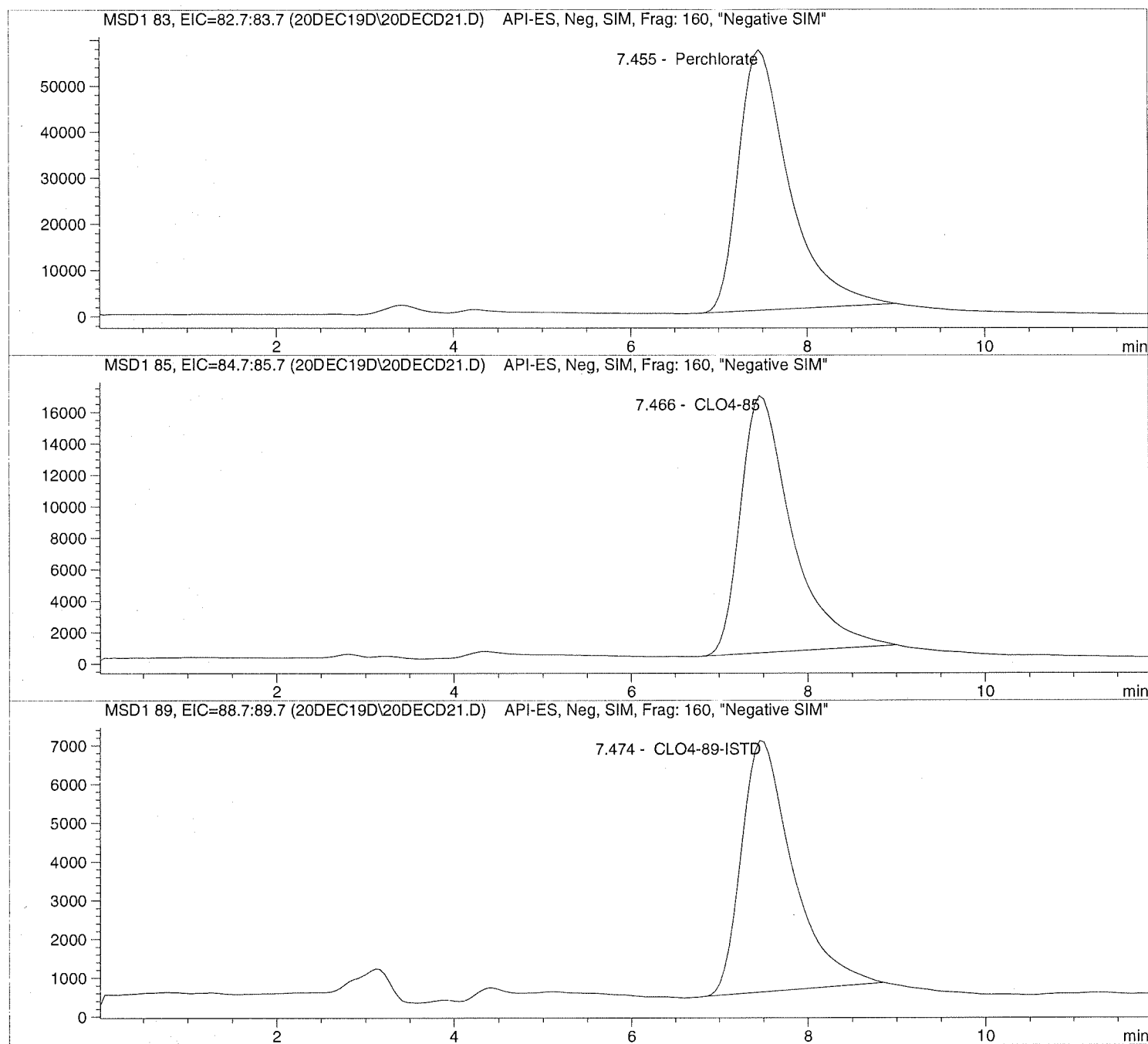
Sample Name: 1935343003

=====
Injection Date: 12/20/2019 17:58:10
Sample Name: 1935343003
Acq Operator: TNB

=====
Seq Line: 21
Location: Vial 90
Inj. No.: 1
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20DEC19D\20DECD21.D Sample Name: 1935343003

```

=====
Injection Date: 12/20/2019 17:58:10      Seq Line:          21
Sample Name:    1935343003                Location:          Vial 90
Acq Operator:   TNB                       Inj. No.:         1
                                           Inj. Vol.:        35 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  0.000
=====

```

```

=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.455	PBA	2245223.3	28.9532	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.466	PBA	655399.1	27.8698	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.474	PBA	260703.4	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\20DEC19D\20DECD22.D

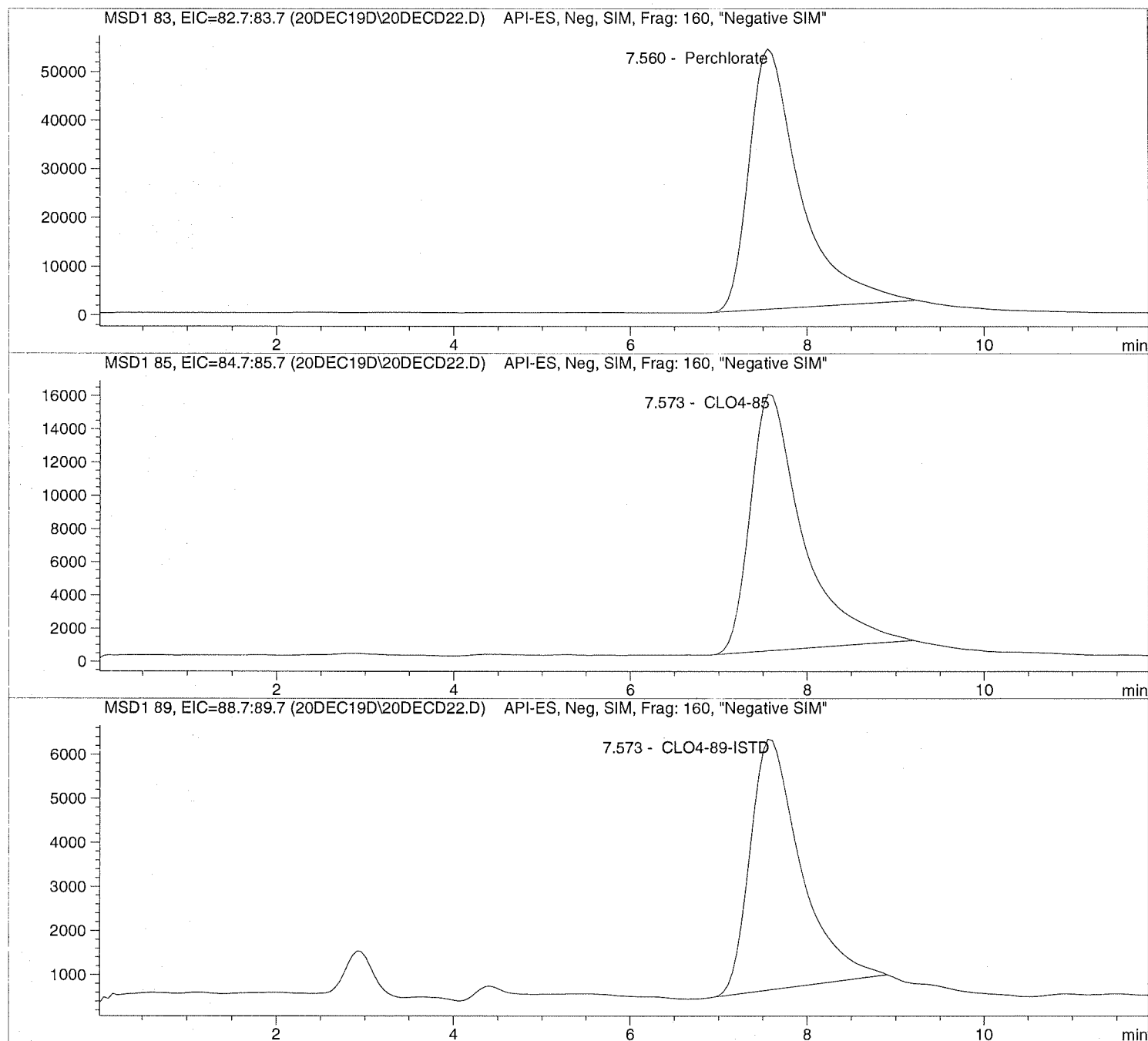
Sample Name: 1935343004 1K

Injection Date: 12/20/2019 18:12:05
Sample Name: 1935343004 1K
Acq Operator: TNB

Seq Line: 22
Location: Vial 91
Inj. No.: 1
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20DEC19D\20DECD22.D Sample Name: 1935343004 1K

```

=====
Injection Date: 12/20/2019 18:12:05      Seq Line:          22
Sample Name:   1935343004 1K             Location:         Vial 91
Acq Operator:  TNB                       Inj. No.:        1
                                           Inj. Vol.:      35 µl
=====

```

```

Acq. Method:   CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:  11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:    1.000000
Dilution:      1000.000000
Sample Amount: 0.000
=====

```

```

=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.560	PBA	2155972.7	31691.1790	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.573	PBA	633070.0	30703.4059	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.573	PBA	226176.3	5000.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

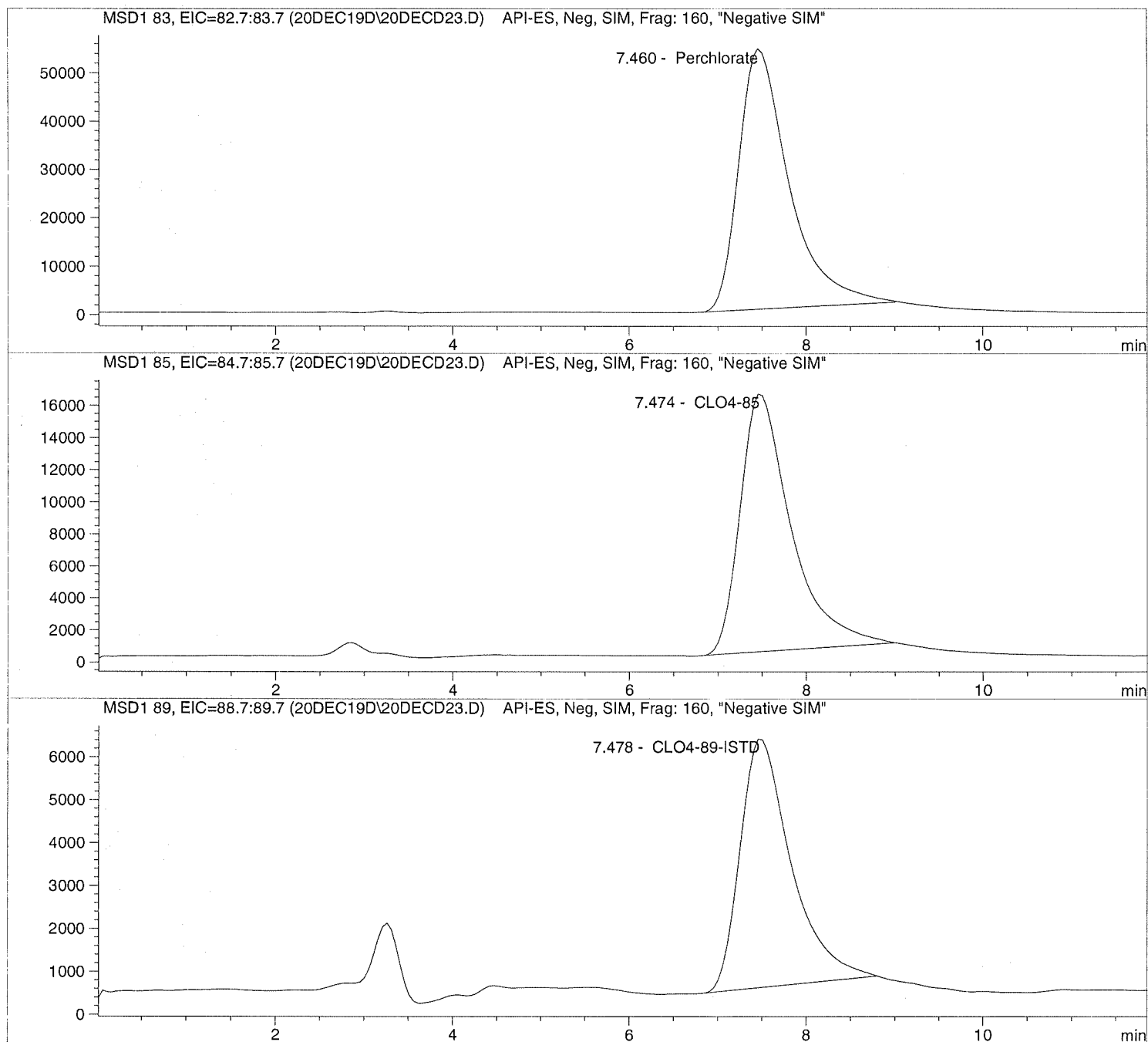
```


Data file: C:\HPCHEM\1\DATA\20DEC19D\20DECD23.D Sample Name: 1935343005 10X

```
=====
Injection Date: 12/20/2019 18:25:57      Seq Line:      23
Sample Name:    1935343005 10X           Location:      Vial 92
Acq Operator:   TNB                      Inj. No.:     1
                                           Inj. Vol.:    35 µl
=====
```

```
Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   11/5/2019 08:44:45
```

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20DEC19D\20DECD23.D Sample Name: 1935343005 10X

```
=====
Injection Date: 12/20/2019 18:25:57      Seq Line:      23
Sample Name:    1935343005 10X          Location:      Vial 92
Acq Operator:   TNB                    Inj. No.:     1
                                           Inj. Vol.:    35 µl
=====
```

```
Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   11/5/2019 08:44:45
```

Perchlorate analysis

=====

Sample Information

=====

```
Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       10.000000
Sample Amount:  0.000
```

=====

LCMS Results

=====

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.460	PBA	2142509.0	306.2809	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.474	PBA	646073.3	303.7870	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.478	PBA	233571.8	50.0000	CLO4-89-ISTD

=====

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\20DEC19D\20DECD24.D

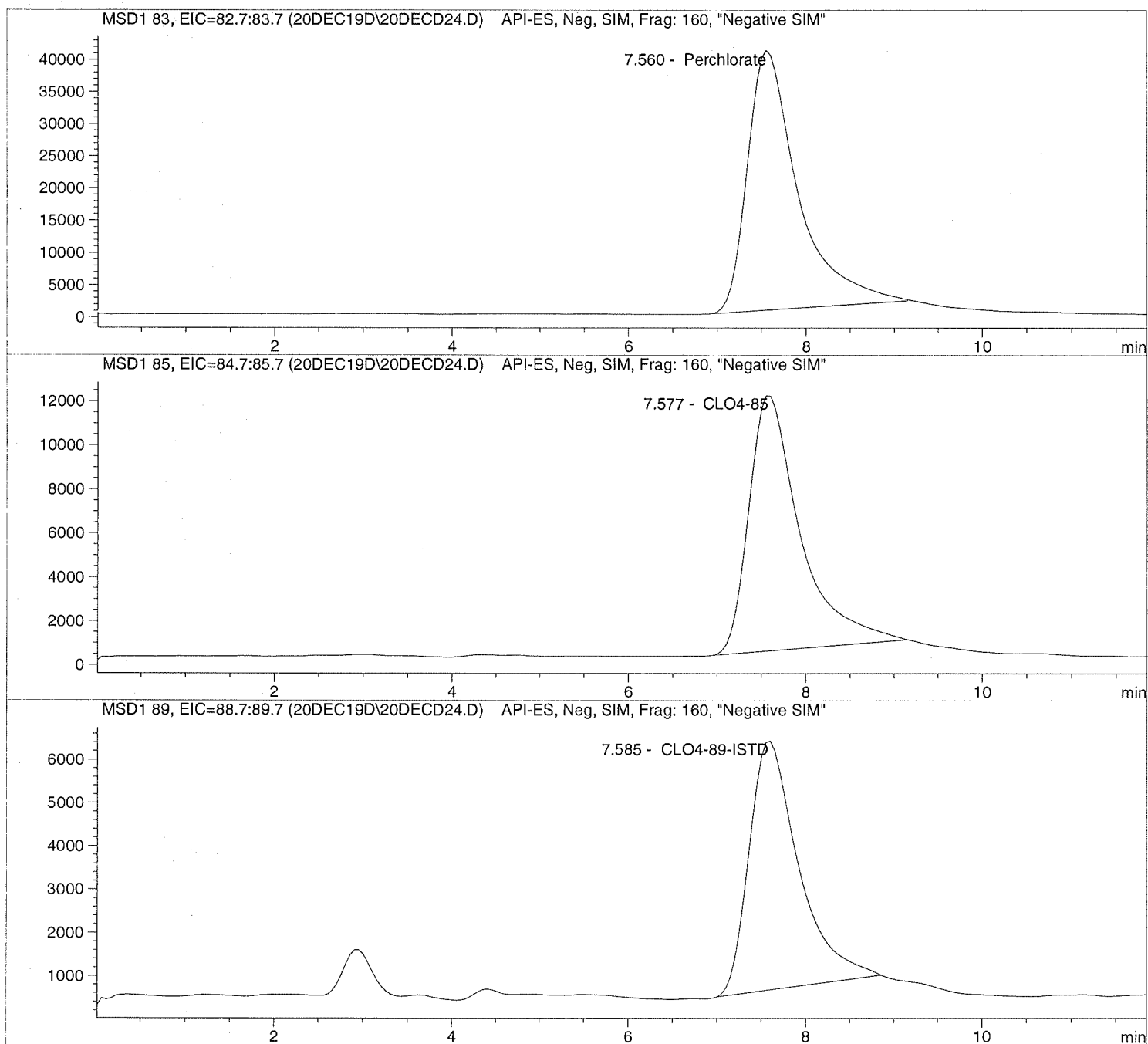
Sample Name: 1935343006 1K

=====
Injection Date: 12/20/2019 18:39:48
Sample Name: 1935343006 1K
Acq Operator: TNB

Seq Line: 24
Location: Vial 93
Inj. No.: 1
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20DEC19D\20DECD24.D Sample Name: 1935343006 1K

```

=====
Injection Date: 12/20/2019 18:39:48      Seq Line:      24
Sample Name:   1935343006 1K             Location:      Vial 93
Acq Operator:  TNB                       Inj. No.:     1
                                           Inj. Vol.:    35 µl
=====

```

```

Acq. Method:   CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:  11/5/2019 08:44:45
=====

```

Perchlorate analysis

Sample Information

```

=====
Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:    1.000000
Dilution:      1000.000000
Sample Amount: 0.000
=====

```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.560	PBA	1595449.5	24449.8022	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.577	PBA	466349.3	23513.4271	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.585	PBA	223474.0	5000.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\20DEC19D\20DECD26.D

Sample Name: 689415 CCV@25

Injection Date: 12/20/2019 19:07:32

Seq Line: 26

Sample Name: 689415 CCV@25

Location: Vial 71

Acq Operator: TNB

Inj. No.: 1

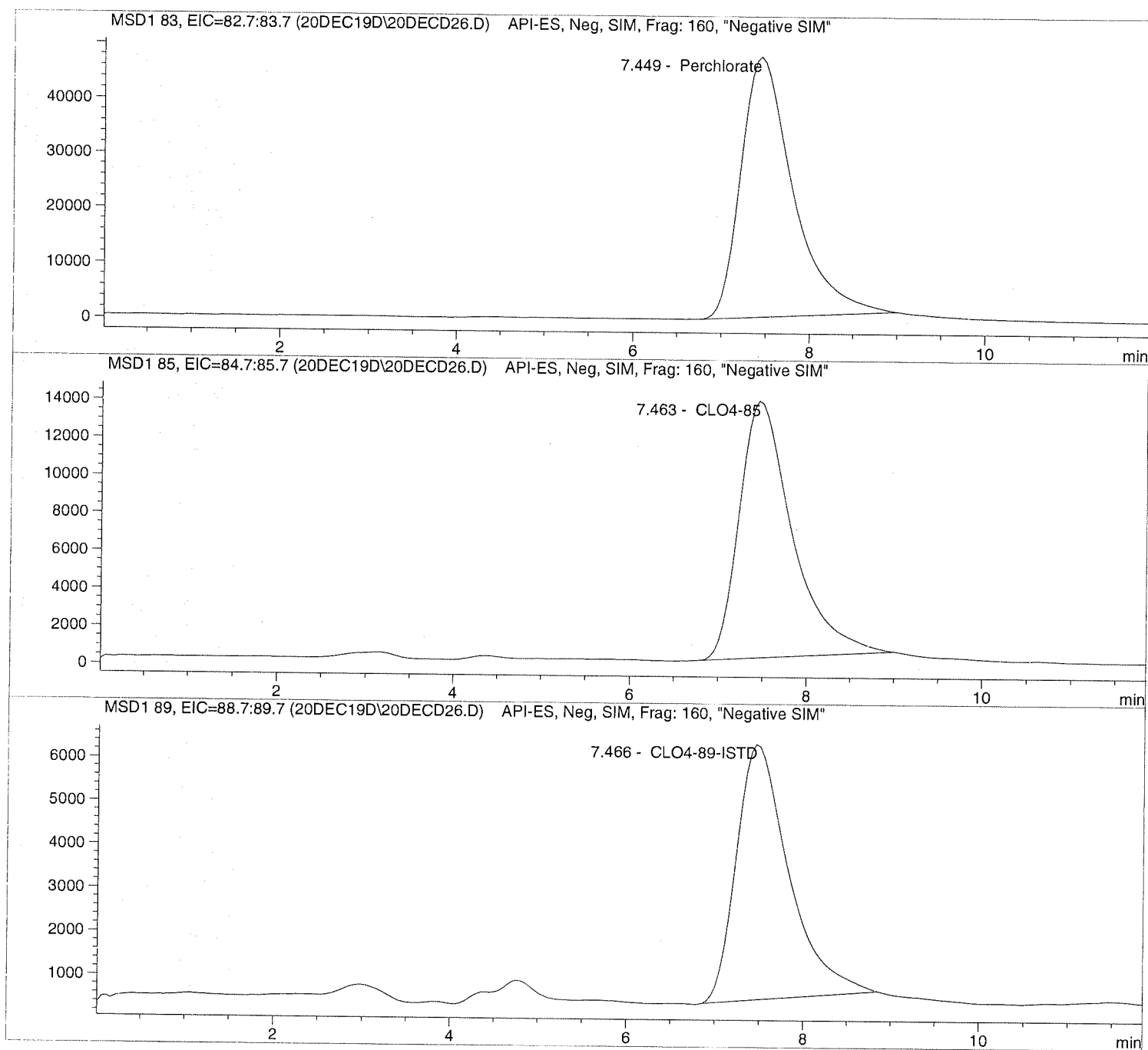
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M

Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20DEC19D\20DECD26.D Sample Name: 689415 CCV@25

```

=====
Injection Date: 12/20/2019 19:07:32      Seq Line:          26
Sample Name:    689415   CCV@25          Location:          Vial 71
Acq Operator:   TNB                Inj. No.:         1
                                           Inj. Vol.:       35 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   11/5/2019 08:44:45
=====

```

Perchlorate analysis

Sample Information

```

=====
Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:    1.000000
Dilution:      1.000000
Sample Amount: 25.000
=====

```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.449	PBA	1939760.0	27.0663	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.463	PBA	567687.4	26.0920	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.466	PBA	242806.7	5.0000	CLO4-89-ISTD

*** End of Report ***



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Initial Calibration

=====
 Calibration Table
 =====

Perchlorate

Calib. Data Modified : 9/23/2019 12:20:59 PM
 Calculate : Internal Standard
 Based on : Peak Area
 Rel. Reference Window : 20.000 %
 Abs. Reference Window : 0.000 min
 Rel. Non-ref. Window : 20.000 %
 Abs. Non-ref. Window : 0.000 min
 Use Multiplier & Dilution Factor with ISTDs
 Uncalibrated Peaks : not reported
 Partial Calibration : No recalibration if peaks missing
 Curve Type : Quadratic (some peaks differ, see below)
 Origin : Ignored (some peaks differ, see below)
 Weight : Linear (Amnt) (some peaks differ, see below)
 Recalibration Settings:
 Average Response : Average all calibrations
 Average Retention Time: Floating Average New 75%

Calibration Report Options :
 Printout of recalibrations within a sequence:
 Calibration Table after Recalibration
 Normal Report after Recalibration
 If the sequence is done with bracketing:
 Results of first cycle (ending previous bracket)

Default Sample ISTD Information (if not set in sample table):

ISTD #	ISTD Amount	Name
1	5.00000	CLO4-89-ISTD

Signal 1: MSD1 83, EIC=82.7:83.7
 Signal 2: MSD1 85, EIC=84.7:85.7
 Signal 3: MSD1 89, EIC=88.7:89.7

RetTime [min]	Lvl Sig	Amount	Area	Amt/Area	Ref Grp	Name
7.750	1 3	1.00000	5.39218e4	1.85454e-5	1	Perchlorate
	4	2.00000	1.32825e5	1.50574e-5		
	5	5.00000	2.76271e5	1.80982e-5		
	6	10.00000	5.61298e5	1.78159e-5		
	7	25.00000	1.51820e6	1.64669e-5		
	8	50.00000	3.31156e6	1.50986e-5		
	9	75.00000	5.23914e6	1.43153e-5		
7.767	3 3	5.00000	2.14568e5	2.33026e-5	+I1	CLO4-89-ISTD
	4	5.00000	2.04758e5	2.44190e-5		
	5	5.00000	2.13407e5	2.34294e-5		
	6	5.00000	2.09246e5	2.38953e-5		
	7	5.00000	2.07403e5	2.41077e-5		
	8	5.00000	2.02929e5	2.46391e-5		
	9	5.00000	1.97933e5	2.52611e-5		
7.778	2 3	1.00000	1.70436e4	5.86732e-5	1	CLO4-85
	4	2.00000	4.20754e4	4.75337e-5		
	5	5.00000	9.24707e4	5.40712e-5		
	6	10.00000	1.68622e5	5.93041e-5		
	7	25.00000	4.63724e5	5.39114e-5		
	8	50.00000	9.95933e5	5.02042e-5		

RetTime [min]	Lvl Sig	Amount	Area	Amt/Area	Ref	Grp	Name
9		75.00000	1.58066e6	4.74484e-5			

More compound-specific settings:

Compound: Perchlorate

Time Window : From 3.581 min To 11.899 min
 Curve Type : Quadratic
 Origin : Ignored
 Calibration Level Weights:/
 Level 3 : 1
 Level 4 : 0.5
 Level 5 : 0.2
 Level 6 : 0.1
 Level 7 : 0.04
 Level 8 : 0.02
 Level 9 : 0.013333

Compound: CLO4-89-ISTD

Time Window : From 3.581 min To 11.896 min
 Curve Type : Linear
 Origin : Included
 Calibration Level Weights:/
 Level 3 : 1
 Level 4 : 1
 Level 5 : 1
 Level 6 : 1
 Level 7 : 1
 Level 8 : 1
 Level 9 : 1

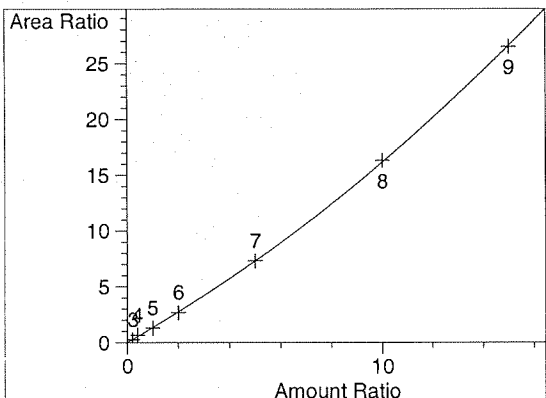
Compound: CLO4-85

Time Window : From 3.601 min To 11.913 min
 Curve Type : Quadratic
 Origin : Ignored
 Calibration Level Weights:/
 Level 3 : 1
 Level 4 : 0.5
 Level 5 : 0.2
 Level 6 : 0.1
 Level 7 : 0.04
 Level 8 : 0.02
 Level 9 : 0.013333

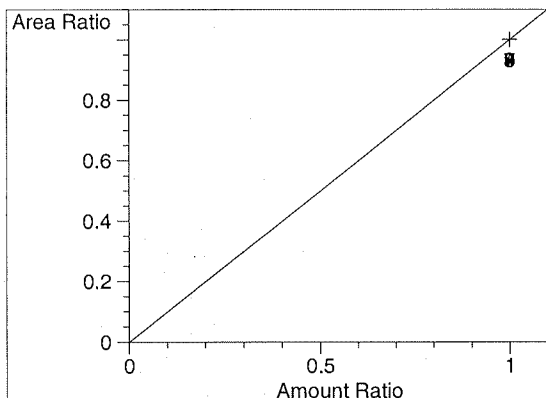
=====
 Peak Sum Table
 =====

No Entries in table
 =====

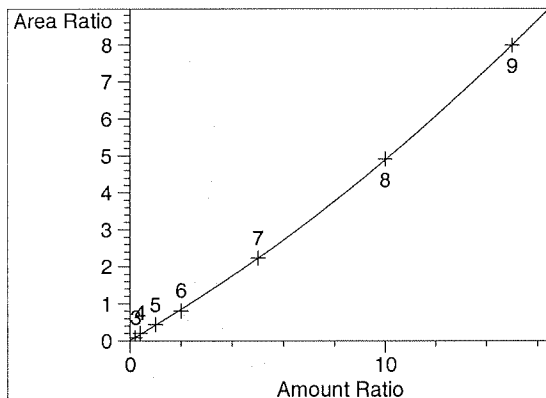
=====
 Calibration Curves
 =====



Perchlorate at exp. RT: 7.750
 MSD1 83, EIC=82.7:83.7
 Correlation: 0.99975
 Residual Std. Dev.: 0.10284
 Formula: $y = ax^2 + bx + c$
 a: 3.10463e-2
 b: 1.30369
 c: 2.19496e-2
 x: Amount Ratio
 y: Area Ratio
 Calibration Level Weights:
 Level 3 : 1
 Level 4 : 0.5
 Level 5 : 0.2
 Level 6 : 0.1
 Level 7 : 0.04
 Level 8 : 0.02
 Level 9 : 0.013333



CLO4-89-ISTD at exp. RT: 7.767
 MSD1 89, EIC=88.7:89.7
 Correlation: 1.00000
 Residual Std. Dev.: 0.00000
 Formula: $y = mx + b$
 m: 1.00000
 b: 0.00000
 x: Amount Ratio
 y: Area Ratio
 Calibration Level Weights:
 Level 3 : 1
 Level 4 : 1
 Level 5 : 1
 Level 6 : 1
 Level 7 : 1
 Level 8 : 1
 Level 9 : 1



CLO4-85 at exp. RT: 7.778
 MSD1 85, EIC=84.7:85.7
 Correlation: 0.99969
 Residual Std. Dev.: 0.02601
 Formula: $y = ax^2 + bx + c$
 a: 8.85207e-3
 b: 3.99283e-1
 c: 1.33505e-2
 x: Amount Ratio
 y: Area Ratio
 Calibration Level Weights:
 Level 3 : 1
 Level 4 : 0.5
 Level 5 : 0.2
 Level 6 : 0.1
 Level 7 : 0.04
 Level 8 : 0.02
 Level 9 : 0.013333

Batch Review Method:

C:\HPCHEM\1\METHODS\CLO4-DP3.M

['#' ==> Run has not been reprocessed with Batch Review Method

['*' ==> Run has been saved with batch file]

#*	Sample	Location	Inj	SampleType	Run	Perchlorate Area	Perchlorat RT	Perchlorate Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	5.39218e4	7.750	8.75982e-1
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	1.32825e5	7.797	2.37682
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	2.76271e5	7.770	4.77237
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	5.61298e5	7.785	9.75097
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	1.51820e6	7.741	25.01082
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	3.31156e6	7.775	50.40300
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	5.23914e6	7.736	74.79107
#*	ICAL Verf@10ug/L	Vial 80	1	Control	11	5.74879e5	7.756	10.11855

#*	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	2.14568e5	7.767	5.00000
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	2.04758e5	7.816	5.00000
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	2.13407e5	7.793	5.00000
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	2.09246e5	7.798	5.00000
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	2.07403e5	7.763	5.00000
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	2.02929e5	7.800	5.00000
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	1.97933e5	7.765	5.00000
#*	ICAL Verf@10ug/L	Vial 80	1	Control	11	2.06243e5	7.776	5.00000

#*	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	1.70436e4	7.778	8.24488e-1
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	4.20754e4	7.805	2.38090
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	9.24707e4	7.787	5.14166
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	1.68622e5	7.781	9.52209
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	4.63724e5	7.760	25.04916
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	9.95933e5	7.793	50.14223
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	1.58066e6	7.758	74.93659
#*	ICAL Verf@10ug/L	Vial 80	1	Control	11	1.71000e5	7.760	9.79043

*** End of Report ***

Sequence Table:

Method and Injection Info Part:

Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
====	=====	=====	=====	===	=====	=====	=====
1	Vial 71	CLO4@ 0.2ug/L	CLO4-AQN	1	Ctrl Samp		
2	Vial 72	CLO4@ 0.5ug/L	CLO4-AQN	1	Ctrl Samp		
3	Vial 73	CLO4@ 1.0ug/L	CLO4-AQN	1	Ctrl Samp		
4	Vial 74	CLO4@ 2.0ug/L	CLO4-AQN	1	Ctrl Samp		
5	Vial 75	CLO4@ 5.0ug/L	CLO4-AQN	1	Ctrl Samp		
6	Vial 76	CLO4@ 10.ug/L	CLO4-AQN	1	Ctrl Samp		
7	Vial 77	CLO4@ 25.ug/L	CLO4-AQN	1	Ctrl Samp		
8	Vial 78	CLO4@ 50.ug/L	CLO4-AQN	1	Ctrl Samp		
9	Vial 79	CLO4@ 75.ug/L	CLO4-AQN	1	Ctrl Samp		
10	Vial 71	CLO4@ 0.2ug/L	CLO4-AQN	1	Ctrl Samp		
11	Vial 80	ICAL Verf@10ug/L	CLO4-AQN	1	Ctrl Samp		

Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI03.D

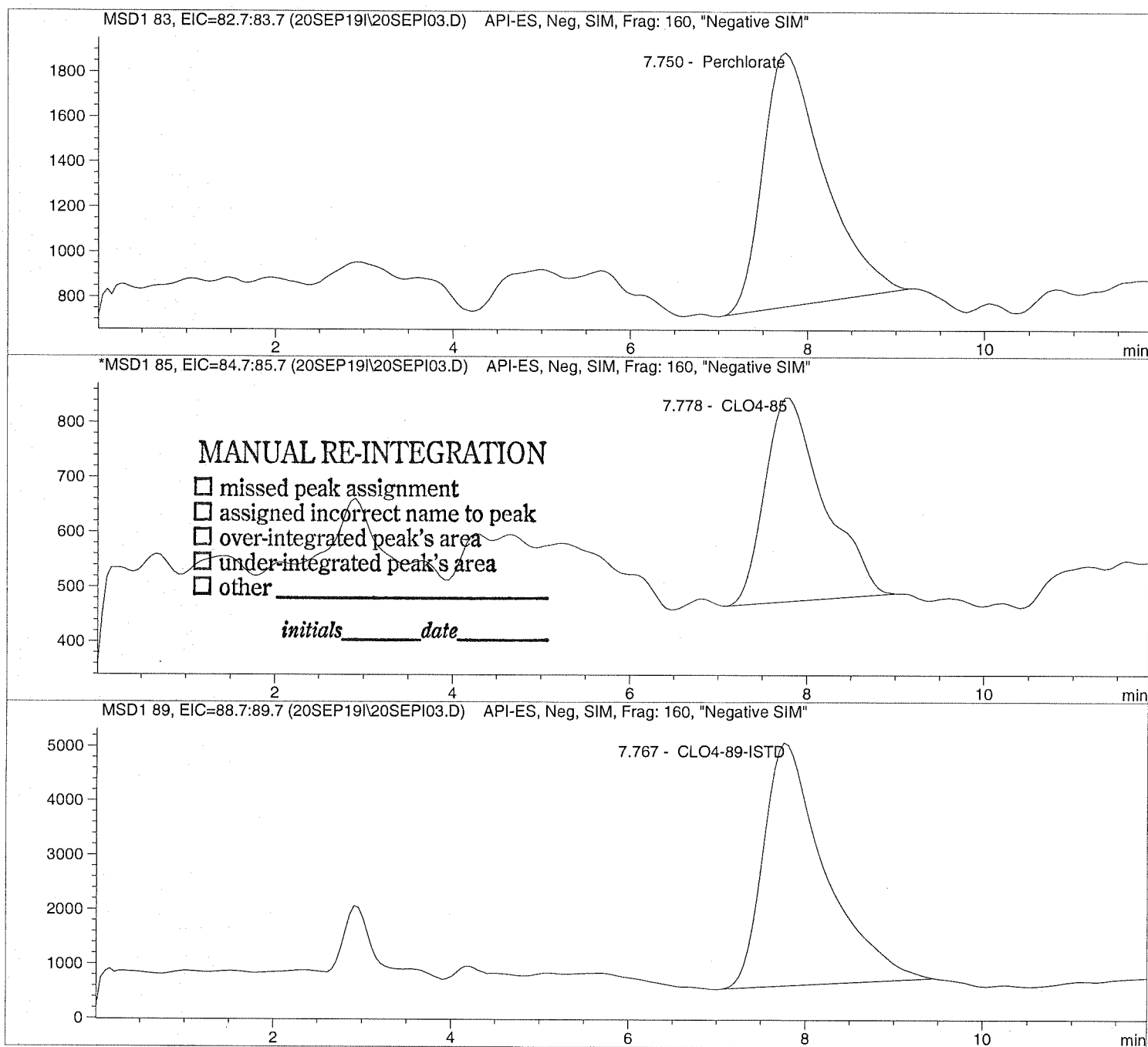
Sample Name: CLO4@ 1.0ug/L

Injection Date: 9/20/2019 09:24:05
Sample Name: CLO4@ 1.0ug/L
Acq Operator: TNB

Seq Line: 3
Location: Vial 73
Inj. No.: 1
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:21:47

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI03.D

Sample Name: CLO4@ 1.0ug/L

```

=====
Injection Date: 9/20/2019 09:24:05      Seq Line: 3
Sample Name: CLO4@ 1.0ug/L              Location: Vial 73
Acq Operator: TNB                       Inj. No.: 1
                                           Inj. Vol.: 30 µl
=====

```

```

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:21:47
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By: Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 1.000
=====

```

```

=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.750	PBA	53921.8	0.8760	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.778	MM	17043.6	0.8245	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.767	PBA	214568.1	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI04.D

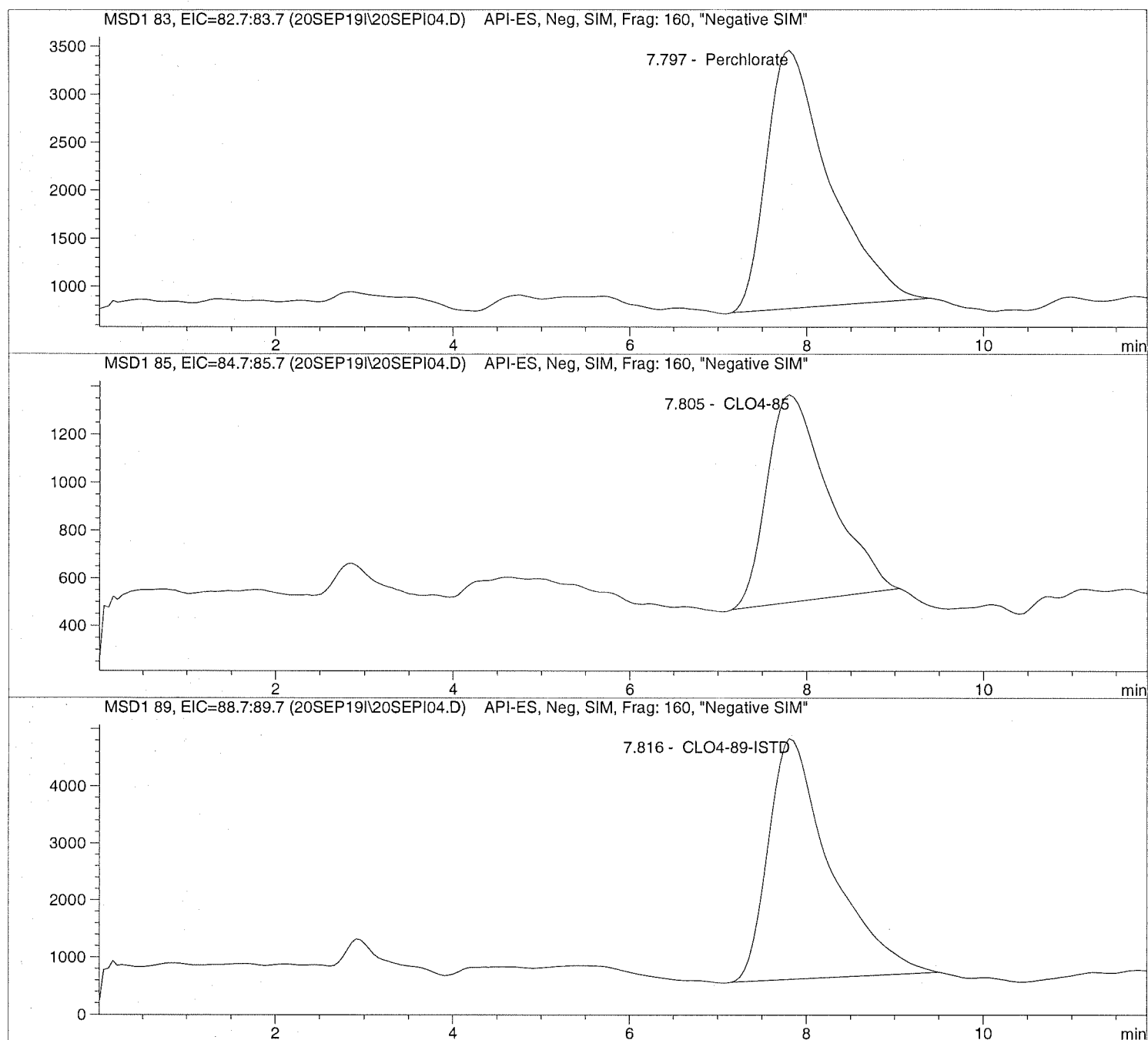
Sample Name: CLO4@ 2.0ug/L

Injection Date: 9/20/2019 09:37:58
Sample Name: CLO4@ 2.0ug/L
Acq Operator: TNB

Seq Line: 4
Location: Vial 74
Inj. No.: 1
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:21:47

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI04.D Sample Name: CLO4@ 2.0ug/L

```

=====
Injection Date: 9/20/2019 09:37:58      Seq Line:      4
Sample Name:   CLO4@ 2.0ug/L           Location:      Vial 74
Acq Operator:  TNB                     Inj. No.:     1
                                           Inj. Vol.:    30 µl
  
```

```

Acq. Method:   CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:  9/23/2019 12:21:47
  
```

Perchlorate analysis

Sample Information

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:    1.000000
Dilution:      1.000000
Sample Amount: 2.000
  
```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.797	PBA	132825.2	2.3768	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.805	PBA	42075.4	2.3809	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.816	PBA	204758.3	5.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI05.D

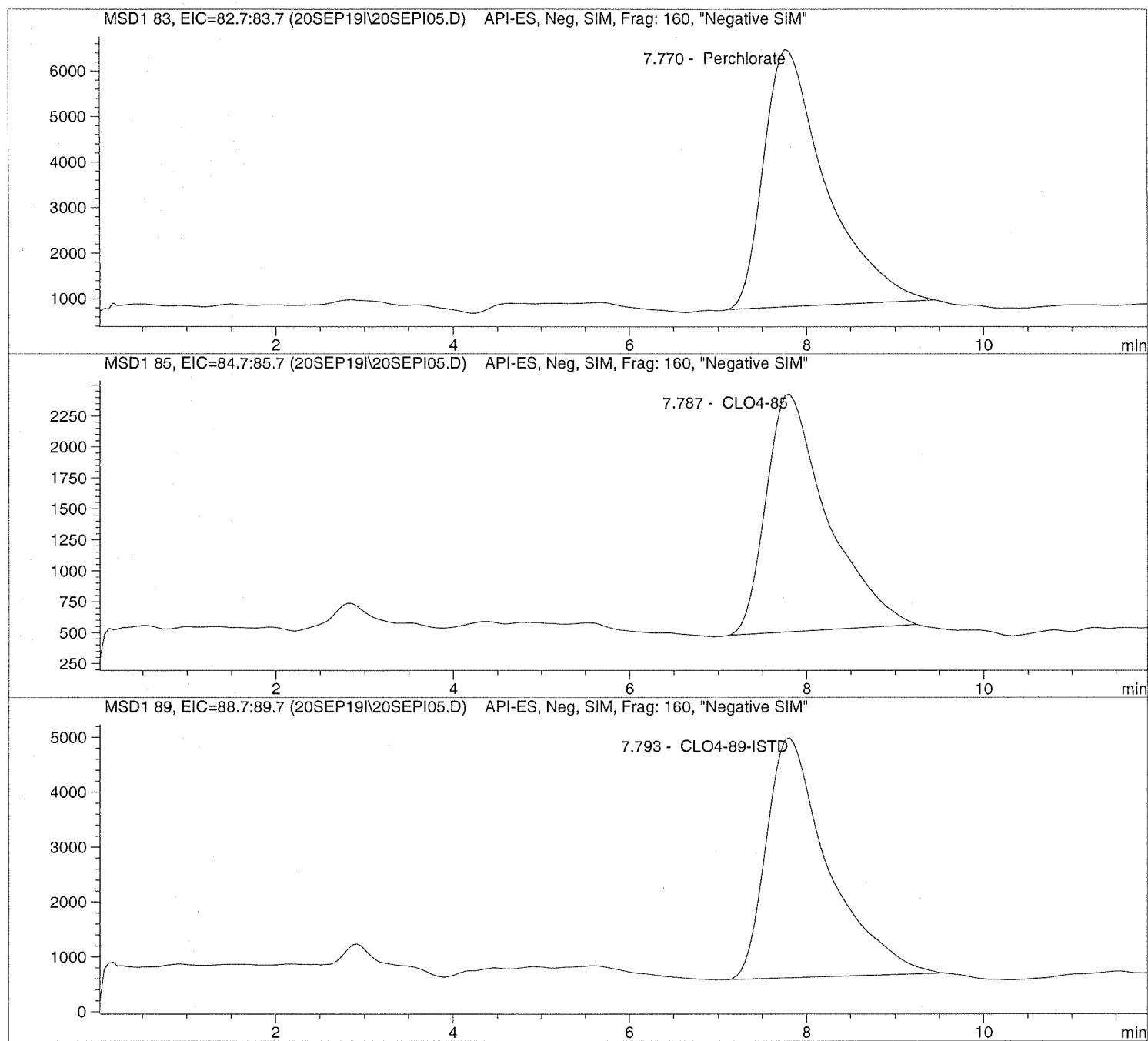
Sample Name: CLO4@ 5.0ug/L

Injection Date: 9/20/2019 09:51:49
Sample Name: CLO4@ 5.0ug/L
Acq Operator: TNB

Seq Line: 5
Location: Vial 75
Inj. No.: 1
Inj. Vol.: 30 μ l

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:21:47

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI05.D Sample Name: CLO4@ 5.0ug/L

```

=====
Injection Date: 9/20/2019 09:51:49      Seq Line: 5
Sample Name:    CLO4@ 5.0ug/L           Location:  Vial 75
Acq Operator:   TNB                     Inj. No.: 1
                                           Inj. Vol.: 30 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   9/23/2019 12:21:47
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  5.000
=====

```

```

=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.770	PBA	276270.7	4.7724	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.787	PBA	92470.7	5.1417	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.793	PBA	213407.0	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\20SEP19\20SEPI06.D

Sample Name: CLO4@ 10.ug/L

Injection Date: 9/20/2019 10:05:36

Seq Line: 6

Sample Name: CLO4@ 10.ug/L

Location: Vial 76

Acq Operator: TNB

Inj. No.: 1

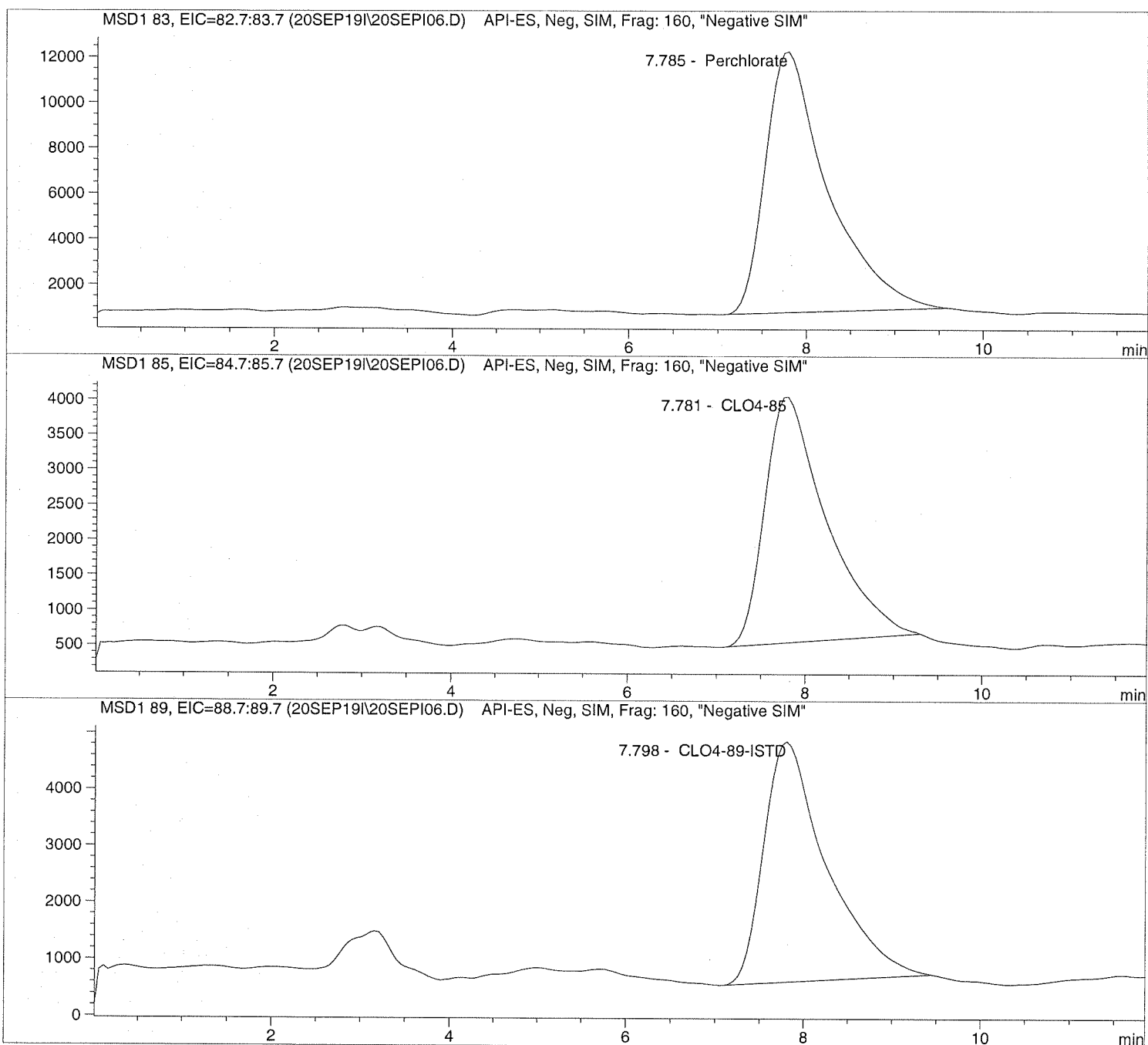
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M

Last Changed: 9/23/2019 12:21:47

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI06.D Sample Name: CLO4@ 10.ug/L

```

=====
Injection Date: 9/20/2019 10:05:36      Seq Line: 6
Sample Name:    CLO4@ 10.ug/L           Location:  Vial 76
Acq Operator:   TNB                     Inj. No.: 1
                                           Inj. Vol.: 30 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   9/23/2019 12:21:47
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  10.000
=====

```

```

=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.785	PBA	561297.7	9.7510	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.781	PBA	168622.4	9.5221	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.798	PBA	209246.3	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI07.D

Sample Name: CLO4@ 25.ug/L

Injection Date: 9/20/2019 10:19:23

Seq Line: 7

Sample Name: CLO4@ 25.ug/L

Location: Vial 77

Acq Operator: TNB

Inj. No.: 1

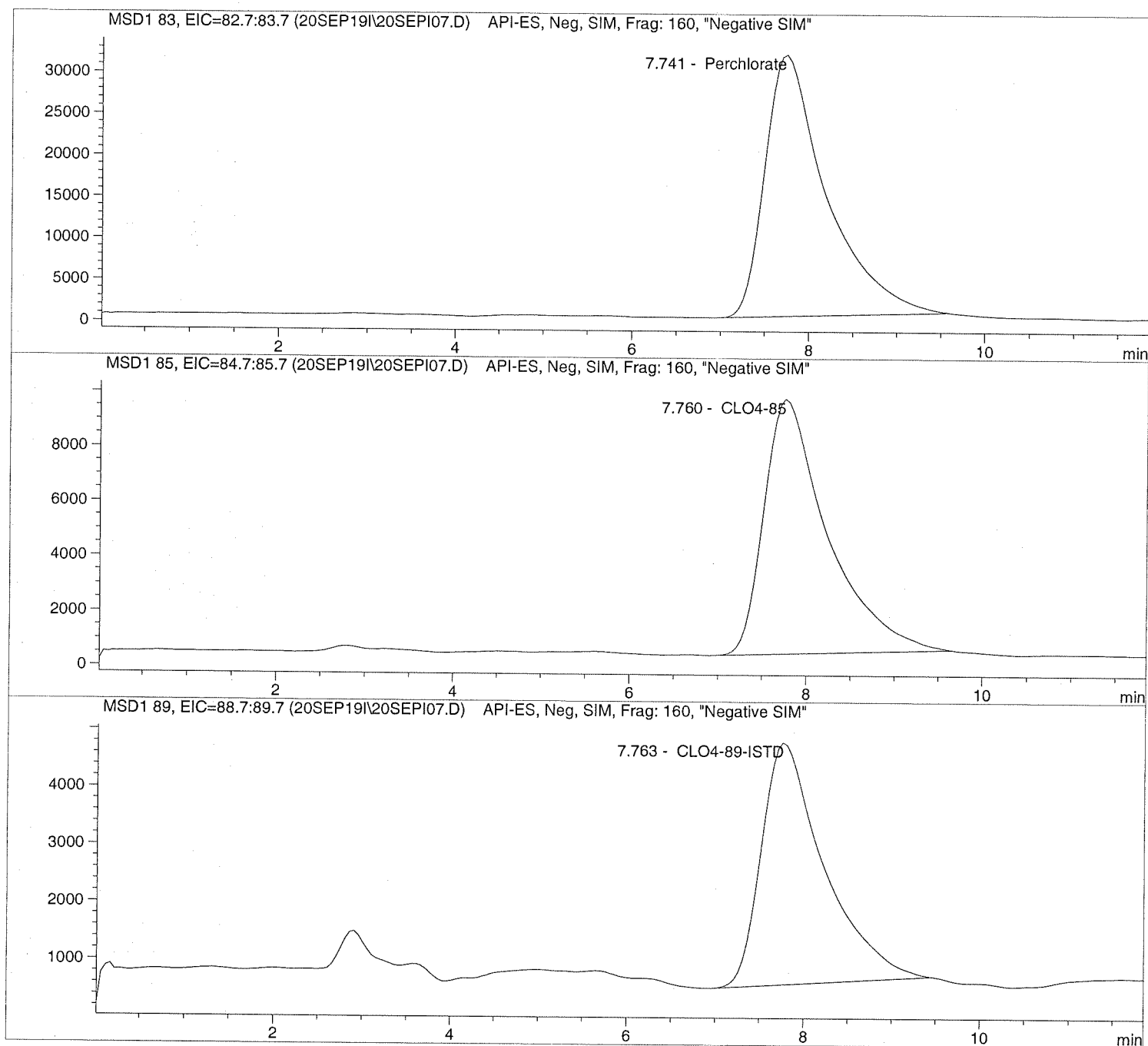
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M

Last Changed: 9/23/2019 12:21:47

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI07.D Sample Name: CLO4@ 25.ug/L

```
=====
Injection Date: 9/20/2019 10:19:23      Seq Line: 7
Sample Name:    CLO4@ 25.ug/L           Location:  Vial 77
Acq Operator:   TNB                     Inj. No.: 1
                                           Inj. Vol.: 30 µl
=====
```

```
Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   9/23/2019 12:21:47
```

Perchlorate analysis

Sample Information

```
Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  25.000
```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.741	PBA	1518197.9	25.0108	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.760	PBA	463724.0	25.0492	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.763	PBA	207402.8	5.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\20SEP19\20SEPI08.D

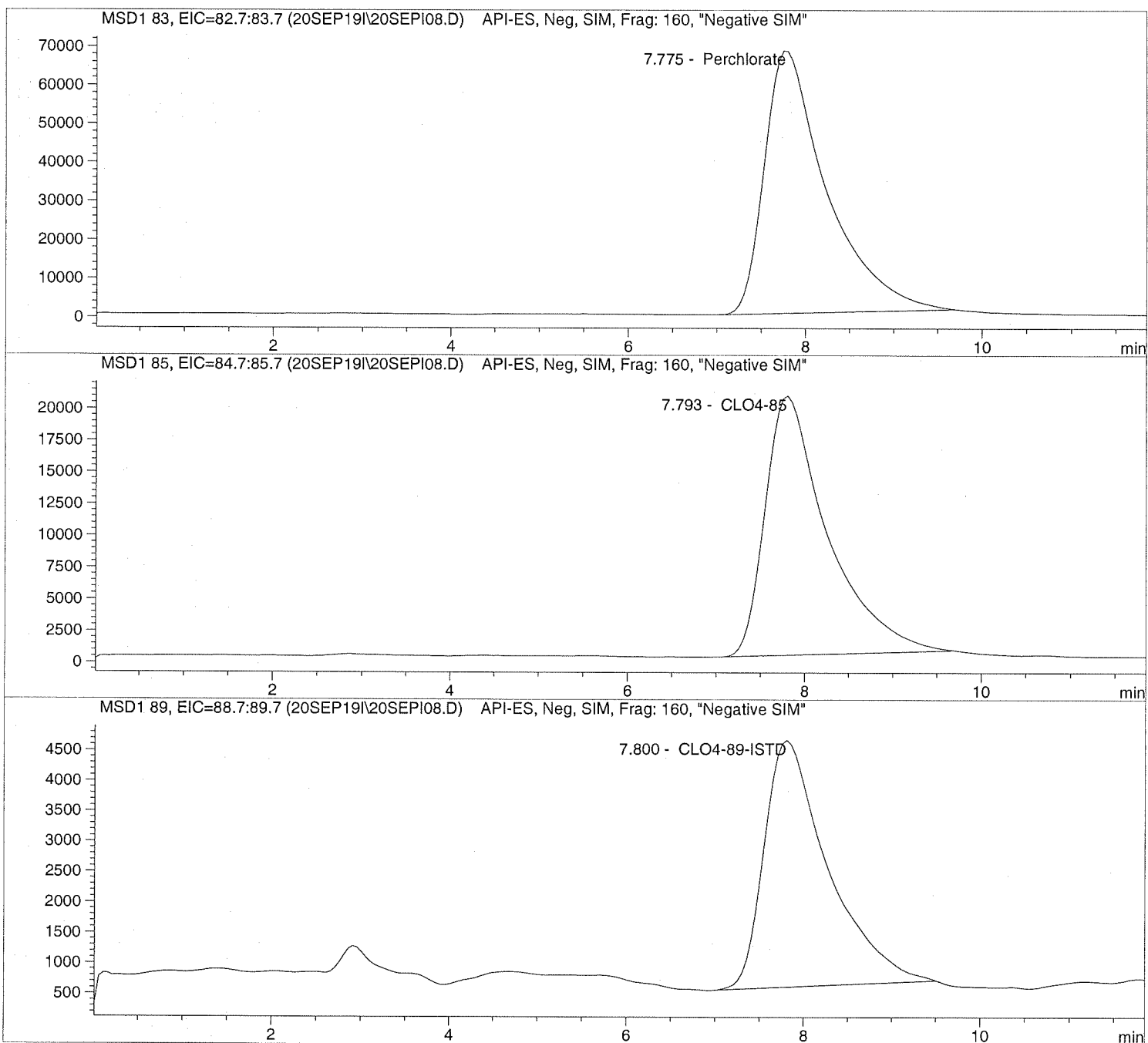
Sample Name: CLO4@ 50.ug/L

Injection Date: 9/20/2019 10:33:18
Sample Name: CLO4@ 50.ug/L
Acq Operator: TNB

Seq Line: 8
Location: Vial 78
Inj. No.: 1
Inj. Vol.: 30 μ l

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:21:47

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI08.D Sample Name: CLO4@ 50.ug/L

```

=====
Injection Date: 9/20/2019 10:33:18      Seq Line:      8
Sample Name:   CLO4@ 50.ug/L           Location:      Vial 78
Acq Operator:  TNB                     Inj. No.:     1
                                           Inj. Vol.:    30 µl
=====

```

```

Acq. Method:   CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:  9/23/2019 12:21:47
=====

```

Perchlorate analysis

Sample Information

```

=====
Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:    1.000000
Dilution:      1.000000
Sample Amount: 50.000
=====

```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.775	PBA	3311559.2	50.4030	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.793	PBA	995933.0	50.1422	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.800	PBA	202929.2	5.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI09.D

Sample Name: CLO4@ 75.ug/L

Injection Date: 9/20/2019 10:47:05

Seq Line: 9

Sample Name: CLO4@ 75.ug/L

Location: Vial 79

Acq Operator: TNB

Inj. No.: 1

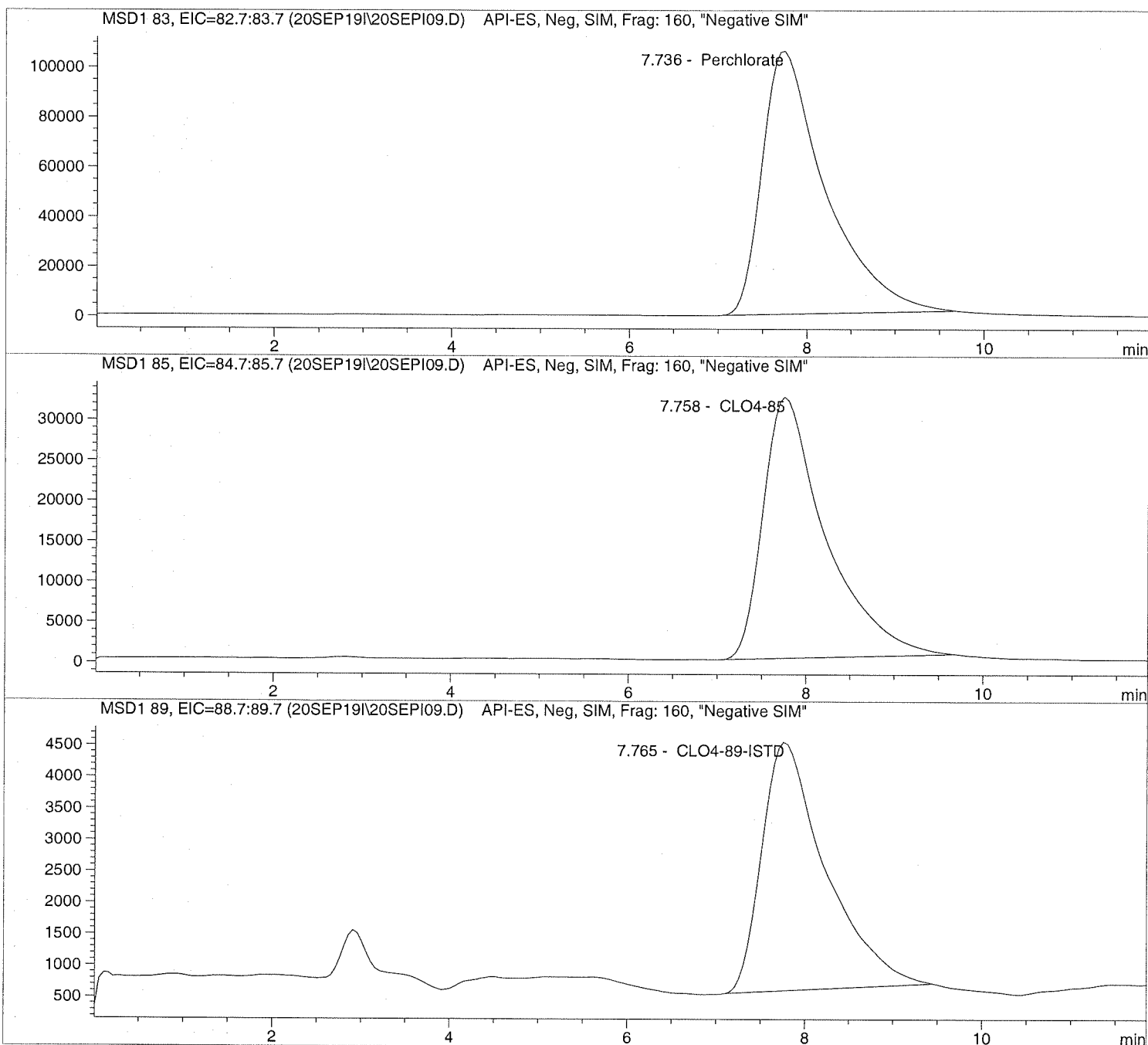
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M

Last Changed: 9/23/2019 12:21:47

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI09.D Sample Name: CLO4@ 75.ug/L

```

=====
Injection Date: 9/20/2019 10:47:05      Seq Line:          9
Sample Name:   CLO4@ 75.ug/L           Location:         Vial 79
Acq Operator:  TNB                     Inj. No.:        1
                                           Inj. Vol.:       30 µl
=====

```

```

Acq. Method:   CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:  9/23/2019 12:21:47
=====

```

Perchlorate analysis

Sample Information

```

=====
Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:    1.000000
Dilution:      1.000000
Sample Amount: 75.000
=====

```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.736	PBA	5239145.0	74.7911	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.758	PBA	1580664.2	74.9366	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.765	PBA	197932.5	5.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI11.D

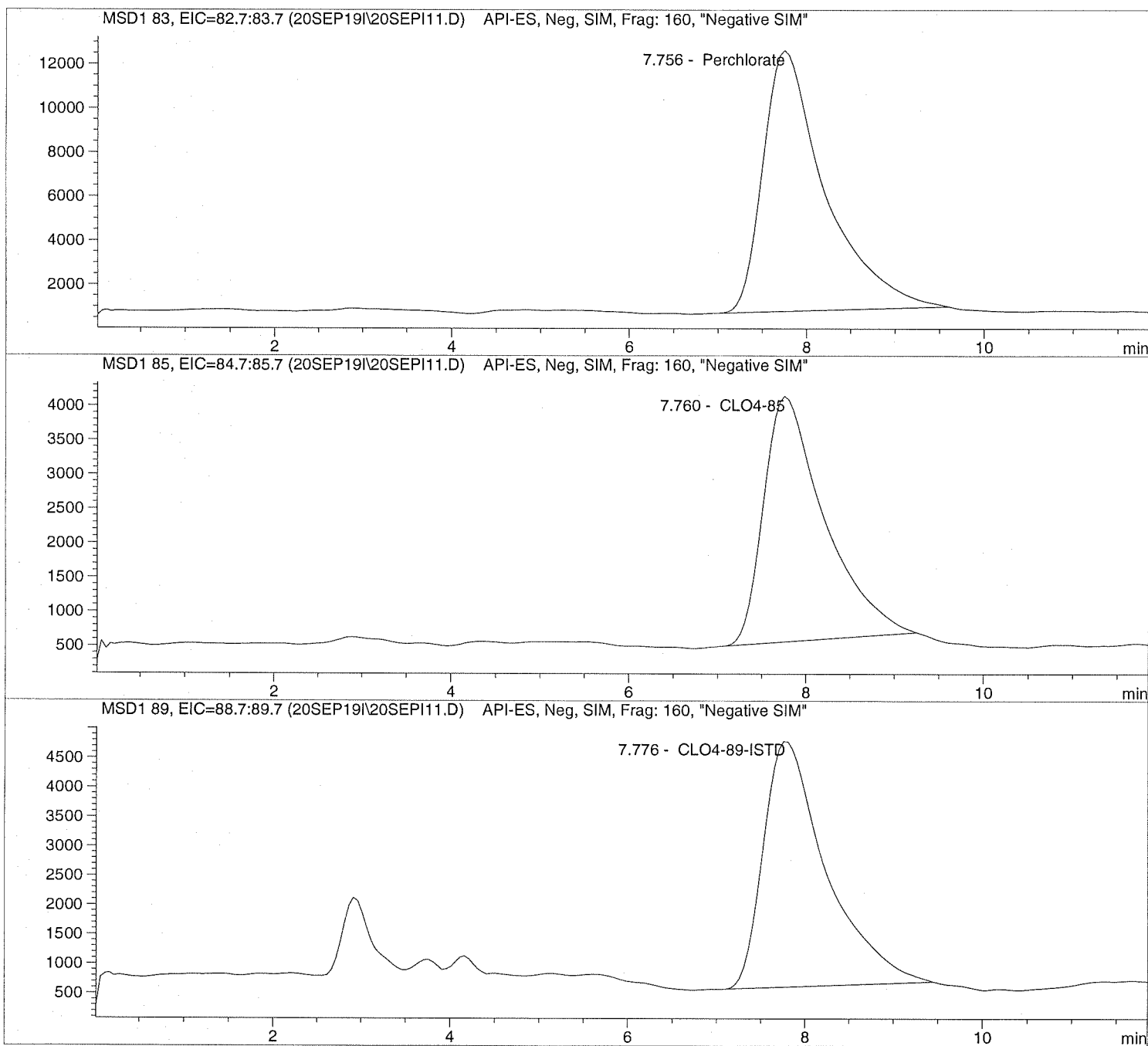
Sample Name: ICAL Verf@10ug/L

Injection Date: 9/20/2019 11:14:45
Sample Name: ICAL Verf@10ug/L
Acq Operator: TNB

Seq Line: 11
Location: Vial 80
Inj. No.: 1
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:21:47

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI11.D Sample Name: ICAL Verf@10ug/L

```

=====
Injection Date: 9/20/2019 11:14:45      Seq Line:                    11
Sample Name:    ICAL Verf@10ug/L        Location:                   Vial 80
Acq Operator:   TNB                      Inj. No.:                   1
                                         Inj. Vol.:                  30 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   9/23/2019 12:21:47
=====

```

Perchlorate analysis

Sample Information

```

=====
Sorted By:                    Signal
Calib. Data Modified:      Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:                1.000000
Dilution:                  1.000000
Sample Amount:             10.000
=====

```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.756	PBA	574879.4	10.1185	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.760	PBA	171000.4	9.7904	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.776	PBA	206243.3	5.0000	CLO4-89-ISTD

*** End of Report ***



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Unmodified

Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI03.D

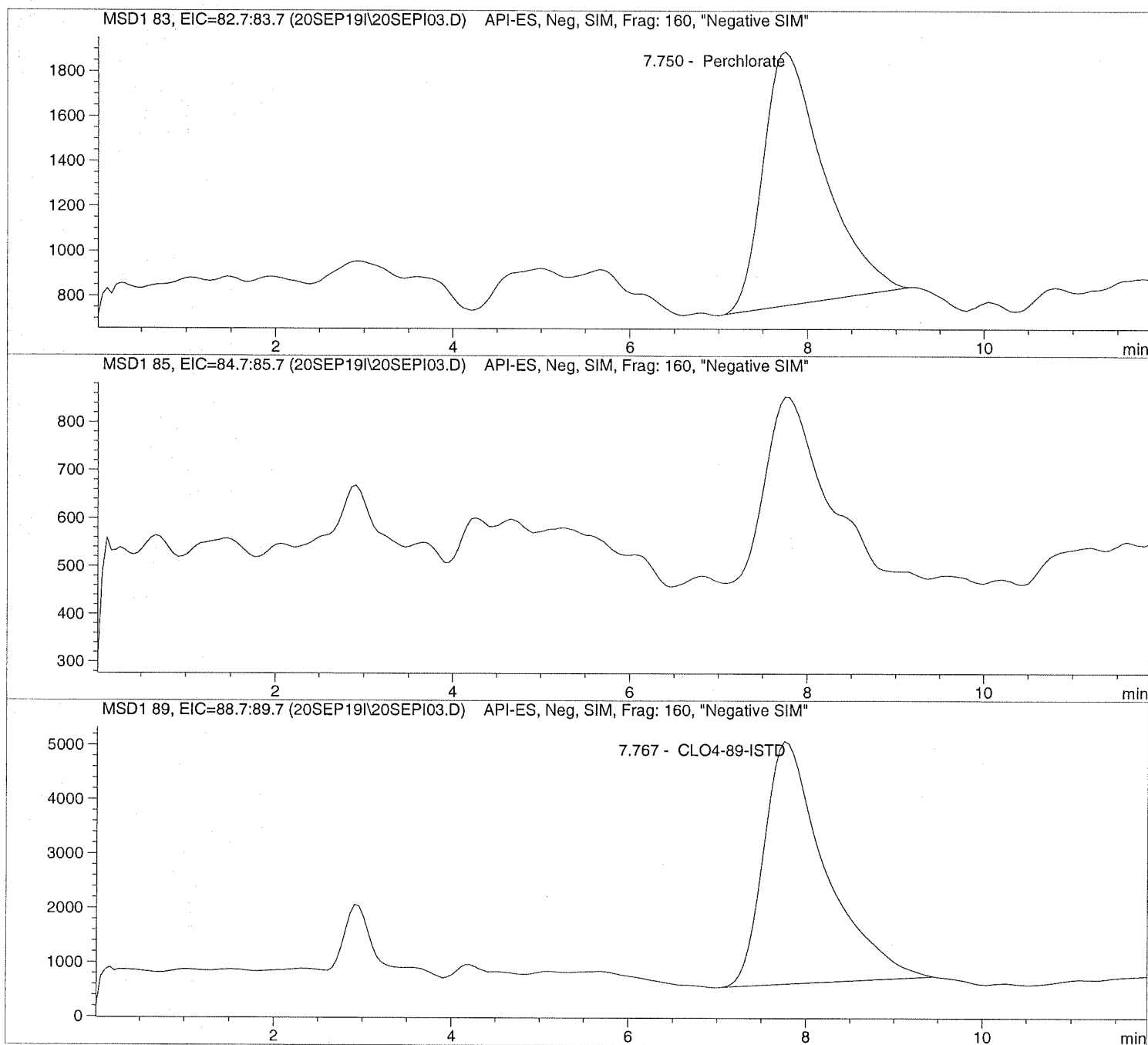
Sample Name: CLO4@ 1.0ug/L

Injection Date: 9/20/2019 09:24:05
Sample Name: CLO4@ 1.0ug/L
Acq Operator: TNB

Seq Line: 3
Location: Vial 73
Inj. No.: 1
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:27:11

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI03.D Sample Name: CLO4@ 1.0ug/L

```

=====
Injection Date: 9/20/2019 09:24:05      Seq Line:      3
Sample Name:    CLO4@ 1.0ug/L           Location:      Vial 73
Acq Operator:   TNB                     Inj. No.:     1
                                           Inj. Vol.:    30 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   9/23/2019 12:27:11
=====

```

Perchlorate analysis

Sample Information

```

=====
Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  1.000
=====

```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.750	PBA	53921.8	0.8760	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.767	PBA	214568.1	5.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\20DEC19D\20DECD14.D

Sample Name: 1935316001

Injection Date: 12/20/2019 16:20:57

Seq Line: 14

Sample Name: 1935316001

Location: Vial 84

Acq Operator: TNB

Inj. No.: 1

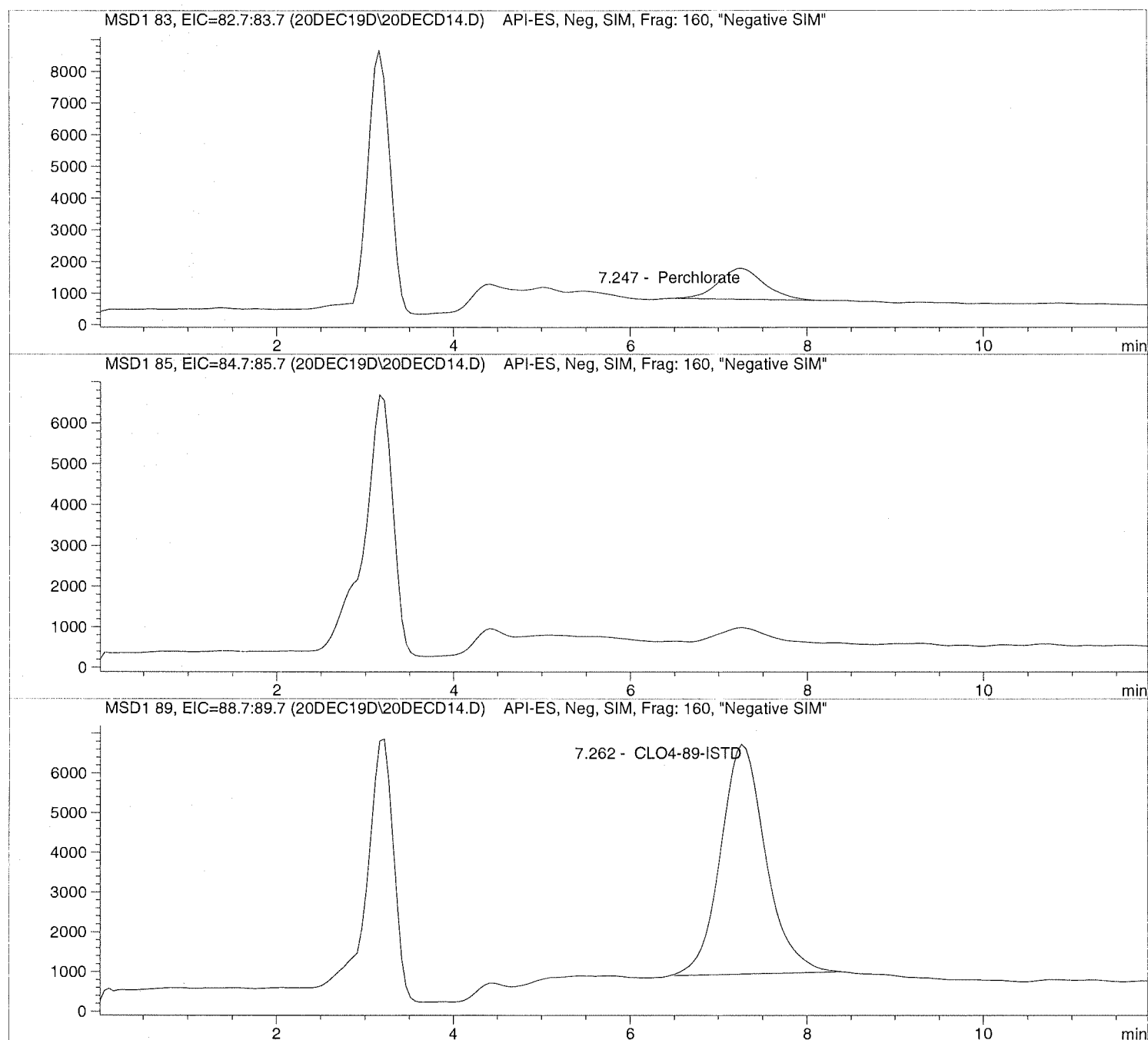
Inj. Vol.: 35 μ l

Acq. Method: CLO4-AQN.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M

Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20DEC19D\20DECD14.D Sample Name: 1935316001

```

=====
Injection Date: 12/20/2019 16:20:57      Seq Line:          14
Sample Name:    1935316001                Location:          Vial 84
Acq Operator:   TNB                       Inj. No.:         1
                                           Inj. Vol.:        35 µl

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   11/5/2019 08:44:45

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  0.000

```

```

=====
                          LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.247	PBA	35246.8	0.5749	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.262	BBA	204617.7	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***

```

Data file: C:\HPCHEM\1\DATA\20DEC19D\20DECD16.D

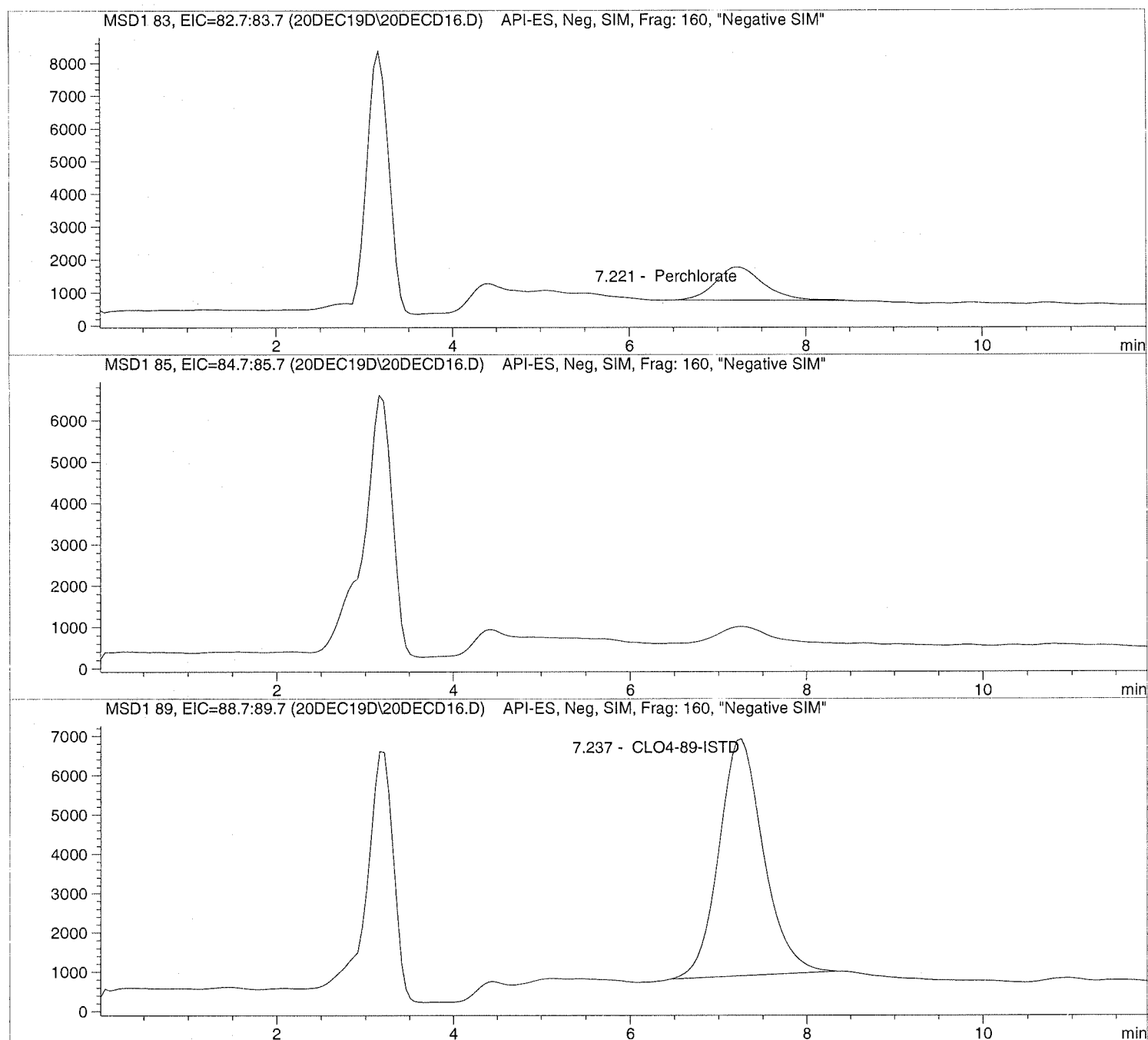
Sample Name: 1935316002

=====
Injection Date: 12/20/2019 16:48:43
Sample Name: 1935316002
Acq Operator: TNB

Seq Line: 16
Location: Vial 85
Inj. No.: 1
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20DEC19D\20DECD16.D Sample Name: 1935316002

```

=====
Injection Date: 12/20/2019 16:48:43      Seq Line:          16
Sample Name:    1935316002                Location:          Vial 85
Acq Operator:   TNB                       Inj. No.:         1
                                           Inj. Vol.:        35 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  0.000
=====

```

```

=====
                          LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.221	PBA	37711.6	0.6019	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.237	PBA	210291.4	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\20DEC19D\20DECD18.D

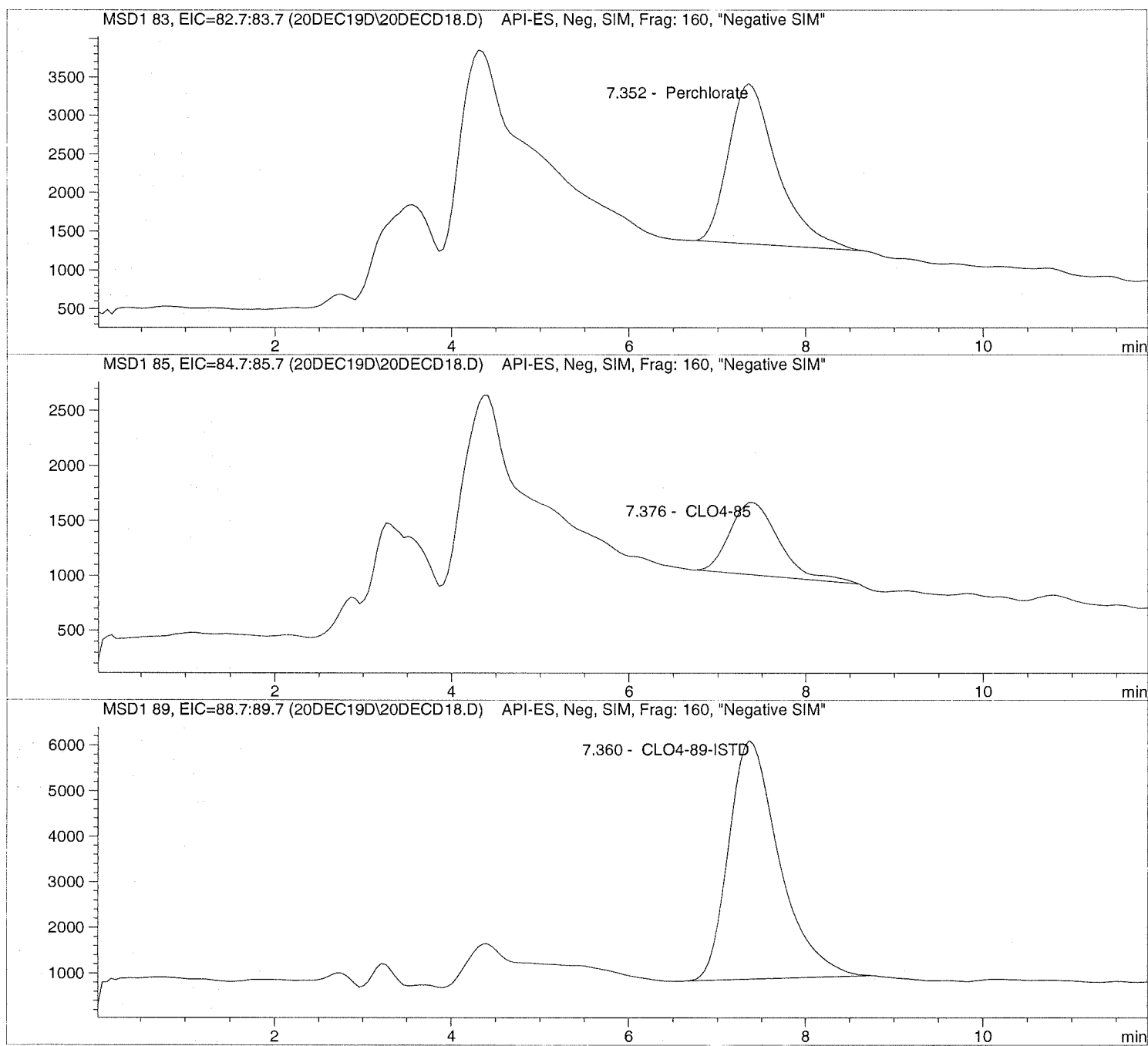
Sample Name: 1935316004

=====
Injection Date: 12/20/2019 17:16:32
Sample Name: 1935316004
Acq Operator: TNB

Seq Line: 18
Location: Vial 87
Inj. No.: 1
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20DEC19D\20DECD18.D Sample Name: 1935316004

```

=====
Injection Date: 12/20/2019 17:16:32      Seq Line:          18
Sample Name:   1935316004                Location:          Vial 87
Acq Operator:  TNB                       Inj. No.:         1
                                           Inj. Vol.:       35 µl
=====

```

```

Acq. Method:   CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:  11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:    1.000000
Dilution:      1.000000
Sample Amount: 0.000
=====

```

```

=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.352	PBA	79516.8	1.3684	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.376	PBA	25544.4	1.3576	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.360	PBA	208671.3	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\20DEC19D\20DECD19.D

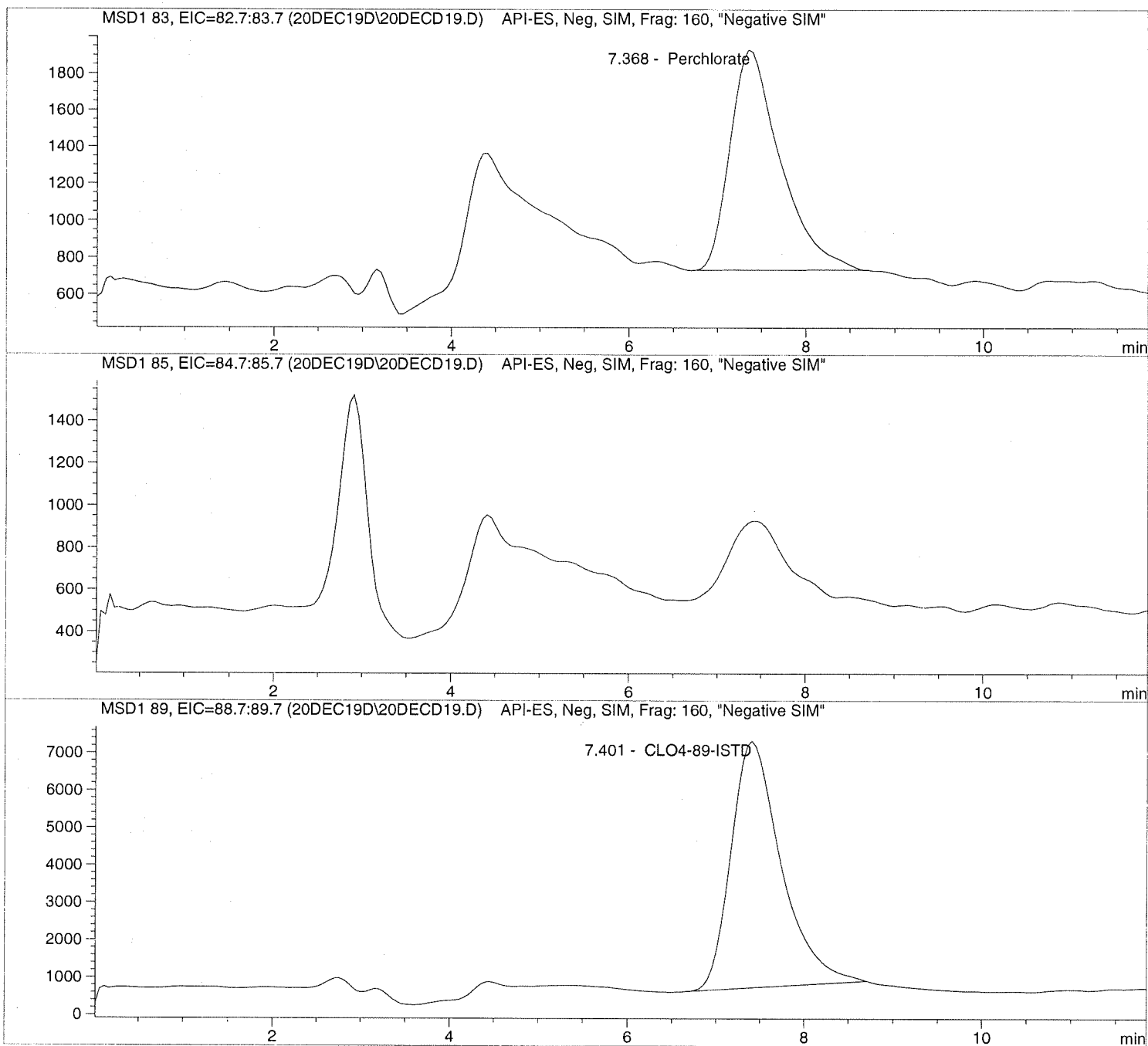
Sample Name: 1935343001

=====
Injection Date: 12/20/2019 17:30:23
Sample Name: 1935343001
Acq Operator: TNB

Seq Line: 19
Location: Vial 88
Inj. No.: 1
Inj. Vol.: 35 μ l

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20DEC19D\20DECD19.D Sample Name: 1935343001

```
=====
Injection Date: 12/20/2019 17:30:23      Seq Line:          19
Sample Name:    1935343001                Location:          Vial 88
Acq Operator:   TNB                       Inj. No.:         1
                                           Inj. Vol.:       35 µl
=====
```

```
Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   11/5/2019 08:44:45
```

Perchlorate analysis

Sample Information

```
Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  0.000
```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.368	PBA	47484.7	0.6123	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.401	PBA	260797.0	5.0000	CLO4-89-ISTD

*** End of Report ***



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

January 03, 2020

Marcia Olive
Bhate Environmental Associates, Inc.
445 Union Blvd Ste 129
Lakewood, CO 80228

Work Order: **HS19120696**

Laboratory Results for: **LHAAP 18 24**

Dear Marcia,

ALS Environmental received 8 sample(s) on Dec 12, 2019 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,

A handwritten signature in black ink, appearing to read "Raj. P. Modashia", enclosed in a circular scribble.

Generated By: JUMOKE.LAWAL
RJ Modashia
Project Manager

ALS Houston, US

Date: 03-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Work Order: HS19120696

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19120696-01	18WW24_121119	Groundwater		11-Dec-2019 07:55	12-Dec-2019 09:05	<input type="checkbox"/>
HS19120696-02	18CpTMW15_121119	Groundwater		11-Dec-2019 08:50	12-Dec-2019 09:05	<input type="checkbox"/>
HS19120696-03	AWD4_121119	Groundwater		11-Dec-2019 09:45	12-Dec-2019 09:05	<input type="checkbox"/>
HS19120696-04	18WW08_121119	Groundwater		11-Dec-2019 10:35	12-Dec-2019 09:05	<input type="checkbox"/>
HS19120696-05	18CpTMW19_121119	Groundwater		11-Dec-2019 11:25	12-Dec-2019 09:05	<input type="checkbox"/>
HS19120696-06	18CpTMW18_121119	Groundwater		11-Dec-2019 12:15	12-Dec-2019 09:05	<input type="checkbox"/>
HS19120696-07	C03_121119	Groundwater		11-Dec-2019 13:10	12-Dec-2019 09:05	<input type="checkbox"/>
HS19120696-08	Trip Blank	Water		11-Dec-2019 00:00	12-Dec-2019 09:05	<input type="checkbox"/>

ALS Houston, US

Date: 03-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Work Order: HS19120696

CASE NARRATIVE

Work Order Comments

- The analysis for Perchlorate was subcontracted to ALS Salt Lake City, UT. Final report attached.
-

GCMS Semivolatiles by Method SW8270SIM**Batch ID: 148814**

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

GCMS Volatiles by Method SW8260**Batch ID: R352668****Sample ID: CCV**

- Carbon disulfide exceeded %D limits for CCV. Samples are ND for this compound.

Sample ID: HS19120702-03MS

- MS and MSD are for an unrelated sample
-

Metals by Method SW6020**Batch ID: 149105****Sample ID: HS19120702-03MS**

- MS/MSD and DUPs are for an unrelated sample
-

Metals by Method SW7470**Batch ID: 149099**

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

ALS Houston, US

Date: 03-Jan-20

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP 18 24
 Sample ID: 18WW24_121119
 Collection Date: 11-Dec-2019 07:55

ANALYTICAL REPORT
 WorkOrder:HS19120696
 Lab ID:HS19120696-01
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD		Method:SW8260						
8260C								Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 13:28
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 13:28
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	16-Dec-2019 13:28
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 13:28
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 13:28
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 13:28
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 13:28
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	16-Dec-2019 13:28
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	16-Dec-2019 13:28
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	16-Dec-2019 13:28
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 13:28
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 13:28
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 13:28
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	16-Dec-2019 13:28
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 13:28
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	16-Dec-2019 13:28
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 13:28
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	16-Dec-2019 13:28
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 13:28
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	16-Dec-2019 13:28
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 13:28
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	16-Dec-2019 13:28
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 13:28
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	16-Dec-2019 13:28
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	16-Dec-2019 13:28
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 13:28
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	16-Dec-2019 13:28
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	16-Dec-2019 13:28
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 13:28
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	16-Dec-2019 13:28
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 13:28
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 13:28
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	16-Dec-2019 13:28
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	16-Dec-2019 13:28
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	16-Dec-2019 13:28
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	16-Dec-2019 13:28
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 13:28
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 13:28
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 13:28

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

ALS Houston, US

Date: 03-Jan-20

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP 18 24
 Sample ID: 18WW24_121119
 Collection Date: 11-Dec-2019 07:55

ANALYTICAL REPORT
 WorkOrder:HS19120696
 Lab ID:HS19120696-01
 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	16-Dec-2019 13:28	
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 13:28	
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	16-Dec-2019 13:28	
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 13:28	
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 13:28	
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 13:28	
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 13:28	
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	UG/L	1	16-Dec-2019 13:28	
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 13:28	
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	16-Dec-2019 13:28	
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	16-Dec-2019 13:28	
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	16-Dec-2019 13:28	
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 13:28	
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 13:28	
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 13:28	
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 13:28	
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 13:28	
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 13:28	
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 13:28	
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 13:28	
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 13:28	
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 13:28	
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 13:28	
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 13:28	
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 13:28	
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>90.1</i>			0	<i>81-118</i>	<i>%REC</i>	<i>1</i>	<i>16-Dec-2019 13:28</i>	
<i>Surr: 4-Bromofluorobenzene</i>	<i>98.7</i>			0	<i>85-114</i>	<i>%REC</i>	<i>1</i>	<i>16-Dec-2019 13:28</i>	
<i>Surr: Dibromofluoromethane</i>	<i>92.7</i>			0	<i>80-119</i>	<i>%REC</i>	<i>1</i>	<i>16-Dec-2019 13:28</i>	
<i>Surr: Toluene-d8</i>	<i>103</i>			0	<i>89-112</i>	<i>%REC</i>	<i>1</i>	<i>16-Dec-2019 13:28</i>	

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

ALS Houston, US

Date: 03-Jan-20

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP 18 24
 Sample ID: 18WW24_121119
 Collection Date: 11-Dec-2019 07:55

ANALYTICAL REPORT
 WorkOrder:HS19120696
 Lab ID:HS19120696-01
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A		Method:SW6020				Prep:SW3010A / 24-Dec-2019		Analyst: JHD
Aluminum	0.0872		0.00180	0.00500	0.0100	mg/L	1	27-Dec-2019 13:30
Antimony	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	27-Dec-2019 13:30
Arsenic	0.00123	J	0.000400	0.000500	0.00500	mg/L	1	27-Dec-2019 13:30
Barium	0.0733		0.00190	0.00250	0.00500	mg/L	1	27-Dec-2019 13:30
Beryllium	0.000558	J	0.000200	0.000500	0.00200	mg/L	1	27-Dec-2019 13:30
Cadmium	0.000487	J	0.000200	0.000500	0.00200	mg/L	1	27-Dec-2019 13:30
Calcium	29.4		0.0340	0.0500	0.500	mg/L	1	27-Dec-2019 13:30
Chromium	0.000461	J	0.000400	0.000500	0.00500	mg/L	1	27-Dec-2019 13:30
Cobalt	0.00579		0.000100	0.000500	0.00500	mg/L	1	27-Dec-2019 13:30
Copper	0.00152	J	0.00100	0.00250	0.00500	mg/L	1	27-Dec-2019 13:30
Iron	0.0979	J	0.0120	0.0500	0.200	mg/L	1	27-Dec-2019 13:30
Lead	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	27-Dec-2019 13:30
Magnesium	24.0		0.0100	0.0500	0.200	mg/L	1	27-Dec-2019 13:30
Manganese	2.09		0.0140	0.0500	0.100	mg/L	20	27-Dec-2019 15:12
Nickel	0.108		0.000600	0.00100	0.00500	mg/L	1	27-Dec-2019 13:30
Potassium	0.604		0.0180	0.0500	0.200	mg/L	1	27-Dec-2019 13:30
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	27-Dec-2019 13:30
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	27-Dec-2019 13:30
Sodium	567		0.280	1.00	4.00	mg/L	20	27-Dec-2019 15:12
Thallium	0.000536	J	0.000200	0.000500	0.00200	mg/L	1	27-Dec-2019 13:30
Vanadium	0.00129	J	0.000600	0.00100	0.00500	mg/L	1	27-Dec-2019 13:30
Zinc	0.0483		0.00200	0.00250	0.00500	mg/L	1	27-Dec-2019 13:30
MERCURY BY SW7470A		Method:SW7470				Prep:SW7470 / 24-Dec-2019		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	24-Dec-2019 17:09
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		Method:NA						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	03-Jan-2020 14:21

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

ALS Houston, US

Date: 03-Jan-20

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP 18 24
 Sample ID: 18CpTMW15_121119
 Collection Date: 11-Dec-2019 08:50

ANALYTICAL REPORT
 WorkOrder:HS19120696
 Lab ID:HS19120696-02
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD		Method:SW8260						
8260C								Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 13:52
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 13:52
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	16-Dec-2019 13:52
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 13:52
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 13:52
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 13:52
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 13:52
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	16-Dec-2019 13:52
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	16-Dec-2019 13:52
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	16-Dec-2019 13:52
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 13:52
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 13:52
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 13:52
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	16-Dec-2019 13:52
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 13:52
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	16-Dec-2019 13:52
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 13:52
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	16-Dec-2019 13:52
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 13:52
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	16-Dec-2019 13:52
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 13:52
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	16-Dec-2019 13:52
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 13:52
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	16-Dec-2019 13:52
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	16-Dec-2019 13:52
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 13:52
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	16-Dec-2019 13:52
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	16-Dec-2019 13:52
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 13:52
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	16-Dec-2019 13:52
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 13:52
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 13:52
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	16-Dec-2019 13:52
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	16-Dec-2019 13:52
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	16-Dec-2019 13:52
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	16-Dec-2019 13:52
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 13:52
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 13:52
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 13:52

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

ALS Houston, US

Date: 03-Jan-20

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP 18 24
 Sample ID: 18CpTMW15_121119
 Collection Date: 11-Dec-2019 08:50

ANALYTICAL REPORT
 WorkOrder:HS19120696
 Lab ID:HS19120696-02
 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	16-Dec-2019 13:52	
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 13:52	
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	16-Dec-2019 13:52	
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 13:52	
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 13:52	
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 13:52	
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 13:52	
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	UG/L	1	16-Dec-2019 13:52	
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 13:52	
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	16-Dec-2019 13:52	
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	16-Dec-2019 13:52	
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	16-Dec-2019 13:52	
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 13:52	
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 13:52	
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 13:52	
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 13:52	
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 13:52	
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 13:52	
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 13:52	
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 13:52	
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 13:52	
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 13:52	
Trichloroethene	1.7		0.20	0.50	1.0	UG/L	1	16-Dec-2019 13:52	
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 13:52	
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 13:52	
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>90.0</i>			0	<i>81-118</i>	%REC	1	16-Dec-2019 13:52	
<i>Surr: 4-Bromofluorobenzene</i>	<i>99.2</i>			0	<i>85-114</i>	%REC	1	16-Dec-2019 13:52	
<i>Surr: Dibromofluoromethane</i>	<i>92.7</i>			0	<i>80-119</i>	%REC	1	16-Dec-2019 13:52	
<i>Surr: Toluene-d8</i>	<i>103</i>			0	<i>89-112</i>	%REC	1	16-Dec-2019 13:52	
SEMIVOLATILES SIM		Method:SW8270SIM				Prep:SW3510 / 17-Dec-2019		Analyst: LG	
1,4-Dioxane	0.010	U	0.010	0.010	0.010	ug/L	1	20-Dec-2019 12:24	
<i>Surr: 2-Fluorobiphenyl</i>	<i>81.2</i>			0	<i>40-140</i>	%REC	1	20-Dec-2019 12:24	
<i>Surr: 4-Terphenyl-d14</i>	<i>89.1</i>			0	<i>40-140</i>	%REC	1	20-Dec-2019 12:24	
<i>Surr: Nitrobenzene-d5</i>	<i>92.4</i>			0	<i>40-140</i>	%REC	1	20-Dec-2019 12:24	
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		Method:NA						Analyst: SUB	
Subcontract Analysis	See Attached		0	0		NA	1	03-Jan-2020 14:21	

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

ALS Houston, US

Date: 03-Jan-20

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP 18 24
 Sample ID: AWD4_121119
 Collection Date: 11-Dec-2019 09:45

ANALYTICAL REPORT

WorkOrder:HS19120696
 Lab ID:HS19120696-03
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD		Method:SW8260						
8260C								Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 14:16
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 14:16
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	16-Dec-2019 14:16
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 14:16
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 14:16
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 14:16
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 14:16
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	16-Dec-2019 14:16
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	16-Dec-2019 14:16
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	16-Dec-2019 14:16
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 14:16
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 14:16
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 14:16
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	16-Dec-2019 14:16
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 14:16
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	16-Dec-2019 14:16
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 14:16
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	16-Dec-2019 14:16
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 14:16
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	16-Dec-2019 14:16
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 14:16
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	16-Dec-2019 14:16
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 14:16
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	16-Dec-2019 14:16
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	16-Dec-2019 14:16
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 14:16
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	16-Dec-2019 14:16
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	16-Dec-2019 14:16
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 14:16
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	16-Dec-2019 14:16
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 14:16
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 14:16
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	16-Dec-2019 14:16
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	16-Dec-2019 14:16
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	16-Dec-2019 14:16
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	16-Dec-2019 14:16
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 14:16
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 14:16
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 14:16

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

ALS Houston, US

Date: 03-Jan-20

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP 18 24
 Sample ID: AWD4_121119
 Collection Date: 11-Dec-2019 09:45

ANALYTICAL REPORT
 WorkOrder:HS19120696
 Lab ID:HS19120696-03
 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	16-Dec-2019 14:16	
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 14:16	
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	16-Dec-2019 14:16	
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 14:16	
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 14:16	
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 14:16	
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 14:16	
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	UG/L	1	16-Dec-2019 14:16	
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 14:16	
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	16-Dec-2019 14:16	
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	16-Dec-2019 14:16	
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	16-Dec-2019 14:16	
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 14:16	
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 14:16	
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 14:16	
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 14:16	
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 14:16	
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 14:16	
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 14:16	
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 14:16	
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 14:16	
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 14:16	
Trichloroethene	0.65	J	0.20	0.50	1.0	UG/L	1	16-Dec-2019 14:16	
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 14:16	
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 14:16	
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>90.7</i>			0	<i>81-118</i>	%REC	1	<i>16-Dec-2019 14:16</i>	
<i>Surr: 4-Bromofluorobenzene</i>	<i>99.2</i>			0	<i>85-114</i>	%REC	1	<i>16-Dec-2019 14:16</i>	
<i>Surr: Dibromofluoromethane</i>	<i>93.3</i>			0	<i>80-119</i>	%REC	1	<i>16-Dec-2019 14:16</i>	
<i>Surr: Toluene-d8</i>	<i>103</i>			0	<i>89-112</i>	%REC	1	<i>16-Dec-2019 14:16</i>	
SEMIVOLATILES SIM		Method:SW8270SIM				Prep:SW3510 / 17-Dec-2019		Analyst: LG	
1,4-Dioxane	0.010	U	0.010	0.010	0.010	ug/L	1	20-Dec-2019 12:43	
<i>Surr: 2-Fluorobiphenyl</i>	<i>80.0</i>			0	<i>40-140</i>	%REC	1	<i>20-Dec-2019 12:43</i>	
<i>Surr: 4-Terphenyl-d14</i>	<i>97.8</i>			0	<i>40-140</i>	%REC	1	<i>20-Dec-2019 12:43</i>	
<i>Surr: Nitrobenzene-d5</i>	<i>83.8</i>			0	<i>40-140</i>	%REC	1	<i>20-Dec-2019 12:43</i>	

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

ALS Houston, US

Date: 03-Jan-20

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP 18 24
 Sample ID: AWD4_121119
 Collection Date: 11-Dec-2019 09:45

ANALYTICAL REPORT
 WorkOrder:HS19120696
 Lab ID:HS19120696-03
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A			Method:SW6020			Prep:SW3010A / 24-Dec-2019		Analyst: JHD
Aluminum	0.692		0.00180	0.00500	0.0100	mg/L	1	27-Dec-2019 13:32
Antimony	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	27-Dec-2019 13:32
Arsenic	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	27-Dec-2019 13:32
Barium	0.213		0.00190	0.00250	0.00500	mg/L	1	27-Dec-2019 13:32
Beryllium	0.000204	J	0.000200	0.000500	0.00200	mg/L	1	27-Dec-2019 13:32
Cadmium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	27-Dec-2019 13:32
Calcium	7.56		0.0340	0.0500	0.500	mg/L	1	27-Dec-2019 13:32
Chromium	0.0998		0.000400	0.000500	0.00500	mg/L	1	27-Dec-2019 13:32
Cobalt	0.00793		0.000100	0.000500	0.00500	mg/L	1	27-Dec-2019 13:32
Copper	0.00868		0.00100	0.00250	0.00500	mg/L	1	27-Dec-2019 13:32
Iron	2.45		0.0120	0.0500	0.200	mg/L	1	27-Dec-2019 13:32
Lead	0.000644	J	0.000600	0.00100	0.00500	mg/L	1	27-Dec-2019 13:32
Magnesium	5.12		0.0100	0.0500	0.200	mg/L	1	27-Dec-2019 13:32
Manganese	0.0714		0.000700	0.00250	0.00500	mg/L	1	27-Dec-2019 13:32
Nickel	0.417		0.000600	0.00100	0.00500	mg/L	1	27-Dec-2019 13:32
Potassium	0.360		0.0180	0.0500	0.200	mg/L	1	27-Dec-2019 13:32
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	27-Dec-2019 13:32
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	27-Dec-2019 13:32
Sodium	46.7		0.0140	0.0500	0.200	mg/L	1	27-Dec-2019 13:32
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	27-Dec-2019 13:32
Vanadium	0.00331	J	0.000600	0.00100	0.00500	mg/L	1	27-Dec-2019 13:32
Zinc	0.00835		0.00200	0.00250	0.00500	mg/L	1	27-Dec-2019 13:32
MERCURY BY SW7470A			Method:SW7470			Prep:SW7470 / 24-Dec-2019		Analyst: FO
Mercury	0.0000530	J	0.0000300	0.000100	0.000200	mg/L	1	24-Dec-2019 17:10
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)			Method:NA			Analyst: SUB		
Subcontract Analysis	See Attached		0	0		NA	1	03-Jan-2020 14:21

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

ALS Houston, US

Date: 03-Jan-20

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP 18 24
 Sample ID: 18WW08_121119
 Collection Date: 11-Dec-2019 10:35

ANALYTICAL REPORT

WorkOrder:HS19120696
 Lab ID:HS19120696-04
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED	
VOLATILES ORGANICS BY METHOD		Method:SW8260							Analyst: PC
8260C									
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 14:40	
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 14:40	
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	16-Dec-2019 14:40	
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 14:40	
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 14:40	
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 14:40	
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 14:40	
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	16-Dec-2019 14:40	
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	16-Dec-2019 14:40	
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	16-Dec-2019 14:40	
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 14:40	
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 14:40	
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 14:40	
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	16-Dec-2019 14:40	
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 14:40	
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	16-Dec-2019 14:40	
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 14:40	
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	16-Dec-2019 14:40	
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 14:40	
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	16-Dec-2019 14:40	
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 14:40	
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	16-Dec-2019 14:40	
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 14:40	
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	16-Dec-2019 14:40	
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	16-Dec-2019 14:40	
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 14:40	
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	16-Dec-2019 14:40	
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	16-Dec-2019 14:40	
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 14:40	
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	16-Dec-2019 14:40	
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 14:40	
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 14:40	
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	16-Dec-2019 14:40	
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	16-Dec-2019 14:40	
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	16-Dec-2019 14:40	
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	16-Dec-2019 14:40	
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 14:40	
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 14:40	
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 14:40	

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

ALS Houston, US

Date: 03-Jan-20

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP 18 24
 Sample ID: 18WW08_121119
 Collection Date: 11-Dec-2019 10:35

ANALYTICAL REPORT
 WorkOrder:HS19120696
 Lab ID:HS19120696-04
 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	16-Dec-2019 14:40	
cis-1,2-Dichloroethene	1.3		0.20	0.50	1.0	UG/L	1	16-Dec-2019 14:40	
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	16-Dec-2019 14:40	
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 14:40	
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 14:40	
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 14:40	
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 14:40	
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	UG/L	1	16-Dec-2019 14:40	
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 14:40	
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	16-Dec-2019 14:40	
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	16-Dec-2019 14:40	
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	16-Dec-2019 14:40	
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 14:40	
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 14:40	
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 14:40	
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 14:40	
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 14:40	
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 14:40	
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 14:40	
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 14:40	
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 14:40	
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 14:40	
Trichloroethene	3.2		0.20	0.50	1.0	UG/L	1	16-Dec-2019 14:40	
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 14:40	
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 14:40	
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>91.0</i>			0	<i>81-118</i>	%REC	1	16-Dec-2019 14:40	
<i>Surr: 4-Bromofluorobenzene</i>	<i>100</i>			0	<i>85-114</i>	%REC	1	16-Dec-2019 14:40	
<i>Surr: Dibromofluoromethane</i>	<i>93.3</i>			0	<i>80-119</i>	%REC	1	16-Dec-2019 14:40	
<i>Surr: Toluene-d8</i>	<i>103</i>			0	<i>89-112</i>	%REC	1	16-Dec-2019 14:40	
SEMIVOLATILES SIM		Method:SW8270SIM				Prep:SW3510 / 17-Dec-2019		Analyst: LG	
1,4-Dioxane	0.12		0.010	0.010	0.010	ug/L	1	20-Dec-2019 13:02	
<i>Surr: 2-Fluorobiphenyl</i>	<i>86.8</i>			0	<i>40-140</i>	%REC	1	20-Dec-2019 13:02	
<i>Surr: 4-Terphenyl-d14</i>	<i>87.1</i>			0	<i>40-140</i>	%REC	1	20-Dec-2019 13:02	
<i>Surr: Nitrobenzene-d5</i>	<i>104</i>			0	<i>40-140</i>	%REC	1	20-Dec-2019 13:02	
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		Method:NA						Analyst: SUB	
Subcontract Analysis	See Attached		0	0		NA	1	03-Jan-2020 14:21	

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

ALS Houston, US

Date: 03-Jan-20

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP 18 24
 Sample ID: 18CpTMW19_121119
 Collection Date: 11-Dec-2019 11:25

ANALYTICAL REPORT

WorkOrder:HS19120696
 Lab ID:HS19120696-05
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD		Method:SW8260						
8260C								Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 15:04
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 15:04
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	16-Dec-2019 15:04
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 15:04
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 15:04
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 15:04
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 15:04
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	16-Dec-2019 15:04
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	16-Dec-2019 15:04
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	16-Dec-2019 15:04
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 15:04
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 15:04
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 15:04
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	16-Dec-2019 15:04
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 15:04
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	16-Dec-2019 15:04
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 15:04
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	16-Dec-2019 15:04
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 15:04
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	16-Dec-2019 15:04
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 15:04
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	16-Dec-2019 15:04
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 15:04
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	16-Dec-2019 15:04
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	16-Dec-2019 15:04
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 15:04
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	16-Dec-2019 15:04
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	16-Dec-2019 15:04
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 15:04
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	16-Dec-2019 15:04
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 15:04
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 15:04
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	16-Dec-2019 15:04
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	16-Dec-2019 15:04
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	16-Dec-2019 15:04
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	16-Dec-2019 15:04
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 15:04
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 15:04
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 15:04

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

ALS Houston, US

Date: 03-Jan-20

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP 18 24
 Sample ID: 18CpTMW19_121119
 Collection Date: 11-Dec-2019 11:25

ANALYTICAL REPORT

WorkOrder:HS19120696
 Lab ID:HS19120696-05
 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	16-Dec-2019 15:04	
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 15:04	
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	16-Dec-2019 15:04	
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 15:04	
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 15:04	
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 15:04	
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 15:04	
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	UG/L	1	16-Dec-2019 15:04	
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 15:04	
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	16-Dec-2019 15:04	
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	16-Dec-2019 15:04	
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	16-Dec-2019 15:04	
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 15:04	
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 15:04	
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 15:04	
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 15:04	
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 15:04	
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 15:04	
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 15:04	
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 15:04	
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 15:04	
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 15:04	
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 15:04	
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 15:04	
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 15:04	
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>89.6</i>			<i>0</i>	<i>81-118</i>	<i>%REC</i>	<i>1</i>	<i>16-Dec-2019 15:04</i>	
<i>Surr: 4-Bromofluorobenzene</i>	<i>98.2</i>			<i>0</i>	<i>85-114</i>	<i>%REC</i>	<i>1</i>	<i>16-Dec-2019 15:04</i>	
<i>Surr: Dibromofluoromethane</i>	<i>92.0</i>			<i>0</i>	<i>80-119</i>	<i>%REC</i>	<i>1</i>	<i>16-Dec-2019 15:04</i>	
<i>Surr: Toluene-d8</i>	<i>102</i>			<i>0</i>	<i>89-112</i>	<i>%REC</i>	<i>1</i>	<i>16-Dec-2019 15:04</i>	
SEMIVOLATILES SIM		Method:SW8270SIM				Prep:SW3510 / 17-Dec-2019		Analyst: LG	
1,4-Dioxane	0.010	U	0.010	0.010	0.010	ug/L	1	20-Dec-2019 13:21	
<i>Surr: 2-Fluorobiphenyl</i>	<i>90.7</i>			<i>0</i>	<i>40-140</i>	<i>%REC</i>	<i>1</i>	<i>20-Dec-2019 13:21</i>	
<i>Surr: 4-Terphenyl-d14</i>	<i>96.8</i>			<i>0</i>	<i>40-140</i>	<i>%REC</i>	<i>1</i>	<i>20-Dec-2019 13:21</i>	
<i>Surr: Nitrobenzene-d5</i>	<i>83.7</i>			<i>0</i>	<i>40-140</i>	<i>%REC</i>	<i>1</i>	<i>20-Dec-2019 13:21</i>	
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		Method:NA						Analyst: SUB	
Subcontract Analysis	See Attached		0	0		NA	1	03-Jan-2020 14:21	

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

ALS Houston, US

Date: 03-Jan-20

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP 18 24
 Sample ID: 18CpTMW18_121119
 Collection Date: 11-Dec-2019 12:15

ANALYTICAL REPORT

WorkOrder:HS19120696
 Lab ID:HS19120696-06
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD		Method:SW8260						
8260C								Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 15:28
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 15:28
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	16-Dec-2019 15:28
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 15:28
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 15:28
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 15:28
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 15:28
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	16-Dec-2019 15:28
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	16-Dec-2019 15:28
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	16-Dec-2019 15:28
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 15:28
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 15:28
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 15:28
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	16-Dec-2019 15:28
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 15:28
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	16-Dec-2019 15:28
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 15:28
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	16-Dec-2019 15:28
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 15:28
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	16-Dec-2019 15:28
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 15:28
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	16-Dec-2019 15:28
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 15:28
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	16-Dec-2019 15:28
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	16-Dec-2019 15:28
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 15:28
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	16-Dec-2019 15:28
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	16-Dec-2019 15:28
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 15:28
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	16-Dec-2019 15:28
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 15:28
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 15:28
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	16-Dec-2019 15:28
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	16-Dec-2019 15:28
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	16-Dec-2019 15:28
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	16-Dec-2019 15:28
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 15:28
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 15:28
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 15:28

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

ALS Houston, US

Date: 03-Jan-20

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP 18 24
 Sample ID: 18CpTMW18_121119
 Collection Date: 11-Dec-2019 12:15

ANALYTICAL REPORT

WorkOrder:HS19120696
 Lab ID:HS19120696-06
 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	16-Dec-2019 15:28	
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 15:28	
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	16-Dec-2019 15:28	
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 15:28	
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 15:28	
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 15:28	
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 15:28	
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	UG/L	1	16-Dec-2019 15:28	
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 15:28	
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	16-Dec-2019 15:28	
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	16-Dec-2019 15:28	
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	16-Dec-2019 15:28	
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 15:28	
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 15:28	
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 15:28	
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 15:28	
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 15:28	
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 15:28	
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 15:28	
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 15:28	
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 15:28	
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 15:28	
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 15:28	
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 15:28	
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 15:28	
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>91.2</i>			0	<i>81-118</i>	<i>%REC</i>	<i>1</i>	<i>16-Dec-2019 15:28</i>	
<i>Surr: 4-Bromofluorobenzene</i>	<i>99.0</i>			0	<i>85-114</i>	<i>%REC</i>	<i>1</i>	<i>16-Dec-2019 15:28</i>	
<i>Surr: Dibromofluoromethane</i>	<i>94.4</i>			0	<i>80-119</i>	<i>%REC</i>	<i>1</i>	<i>16-Dec-2019 15:28</i>	
<i>Surr: Toluene-d8</i>	<i>104</i>			0	<i>89-112</i>	<i>%REC</i>	<i>1</i>	<i>16-Dec-2019 15:28</i>	

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

ALS Houston, US

Date: 03-Jan-20

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP 18 24
 Sample ID: 18CpTMW18_121119
 Collection Date: 11-Dec-2019 12:15

ANALYTICAL REPORT

WorkOrder:HS19120696
 Lab ID:HS19120696-06
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A		Method:SW6020				Prep:SW3010A / 24-Dec-2019		Analyst: JHD
Aluminum	0.0128		0.00180	0.00500	0.0100	mg/L	1	27-Dec-2019 13:37
Antimony	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	27-Dec-2019 13:37
Arsenic	0.00125	J	0.000400	0.000500	0.00500	mg/L	1	27-Dec-2019 13:37
Barium	0.686		0.00190	0.00250	0.00500	mg/L	1	27-Dec-2019 13:37
Beryllium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	27-Dec-2019 13:37
Cadmium	0.000346	J	0.000200	0.000500	0.00200	mg/L	1	27-Dec-2019 13:37
Calcium	241		0.680	1.00	10.0	mg/L	20	27-Dec-2019 15:14
Chromium	0.00161	J	0.000400	0.000500	0.00500	mg/L	1	27-Dec-2019 13:37
Cobalt	0.0159		0.000100	0.000500	0.00500	mg/L	1	27-Dec-2019 13:37
Copper	0.00250	U	0.00100	0.00250	0.00500	mg/L	1	27-Dec-2019 13:37
Iron	0.802		0.0120	0.0500	0.200	mg/L	1	27-Dec-2019 13:37
Lead	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	27-Dec-2019 13:37
Magnesium	183		0.200	1.00	4.00	mg/L	20	27-Dec-2019 15:14
Manganese	2.03		0.0140	0.0500	0.100	mg/L	20	27-Dec-2019 15:14
Nickel	0.0148		0.000600	0.00100	0.00500	mg/L	1	27-Dec-2019 13:37
Potassium	2.99		0.0180	0.0500	0.200	mg/L	1	27-Dec-2019 13:37
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	27-Dec-2019 13:37
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	27-Dec-2019 13:37
Sodium	667		0.280	1.00	4.00	mg/L	20	27-Dec-2019 15:14
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	27-Dec-2019 13:37
Vanadium	0.00113	J	0.000600	0.00100	0.00500	mg/L	1	27-Dec-2019 13:37
Zinc	0.0270		0.00200	0.00250	0.00500	mg/L	1	27-Dec-2019 13:37
MERCURY BY SW7470A		Method:SW7470				Prep:SW7470 / 24-Dec-2019		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	24-Dec-2019 17:12
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		Method:NA						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	03-Jan-2020 14:21

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

ALS Houston, US

Date: 03-Jan-20

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP 18 24
 Sample ID: C03_121119
 Collection Date: 11-Dec-2019 13:10

ANALYTICAL REPORT

WorkOrder:HS19120696
 Lab ID:HS19120696-07
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD		Method:SW8260						
8260C								Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 15:53
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 15:53
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	16-Dec-2019 15:53
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 15:53
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 15:53
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 15:53
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 15:53
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	16-Dec-2019 15:53
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	16-Dec-2019 15:53
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	16-Dec-2019 15:53
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 15:53
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 15:53
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 15:53
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	16-Dec-2019 15:53
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 15:53
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	16-Dec-2019 15:53
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 15:53
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	16-Dec-2019 15:53
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 15:53
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	16-Dec-2019 15:53
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 15:53
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	16-Dec-2019 15:53
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 15:53
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	16-Dec-2019 15:53
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	16-Dec-2019 15:53
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 15:53
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	16-Dec-2019 15:53
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	16-Dec-2019 15:53
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 15:53
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	16-Dec-2019 15:53
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 15:53
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 15:53
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	16-Dec-2019 15:53
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	16-Dec-2019 15:53
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	16-Dec-2019 15:53
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	16-Dec-2019 15:53
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 15:53
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 15:53
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 15:53

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

ALS Houston, US

Date: 03-Jan-20

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP 18 24
 Sample ID: C03_121119
 Collection Date: 11-Dec-2019 13:10

ANALYTICAL REPORT
 WorkOrder:HS19120696
 Lab ID:HS19120696-07
 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	16-Dec-2019 15:53	
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 15:53	
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	16-Dec-2019 15:53	
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 15:53	
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 15:53	
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 15:53	
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 15:53	
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	UG/L	1	16-Dec-2019 15:53	
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 15:53	
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	16-Dec-2019 15:53	
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	16-Dec-2019 15:53	
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	16-Dec-2019 15:53	
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 15:53	
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 15:53	
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 15:53	
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 15:53	
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 15:53	
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 15:53	
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 15:53	
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 15:53	
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 15:53	
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 15:53	
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 15:53	
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 15:53	
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 15:53	
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>90.8</i>			0	<i>81-118</i>	%REC	1	<i>16-Dec-2019 15:53</i>	
<i>Surr: 4-Bromofluorobenzene</i>	<i>101</i>			0	<i>85-114</i>	%REC	1	<i>16-Dec-2019 15:53</i>	
<i>Surr: Dibromofluoromethane</i>	<i>92.8</i>			0	<i>80-119</i>	%REC	1	<i>16-Dec-2019 15:53</i>	
<i>Surr: Toluene-d8</i>	<i>101</i>			0	<i>89-112</i>	%REC	1	<i>16-Dec-2019 15:53</i>	
SEMIVOLATILES SIM		Method:SW8270SIM				Prep:SW3510 / 17-Dec-2019		Analyst: LG	
1,4-Dioxane	0.054		0.010	0.010	0.010	ug/L	1	20-Dec-2019 13:40	
<i>Surr: 2-Fluorobiphenyl</i>	<i>80.7</i>			0	<i>40-140</i>	%REC	1	<i>20-Dec-2019 13:40</i>	
<i>Surr: 4-Terphenyl-d14</i>	<i>96.0</i>			0	<i>40-140</i>	%REC	1	<i>20-Dec-2019 13:40</i>	
<i>Surr: Nitrobenzene-d5</i>	<i>80.3</i>			0	<i>40-140</i>	%REC	1	<i>20-Dec-2019 13:40</i>	
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		Method:NA						Analyst: SUB	
Subcontract Analysis	See Attached		0	0		NA	1	03-Jan-2020 14:21	

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

ALS Houston, US

Date: 03-Jan-20

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP 18 24
 Sample ID: Trip Blank
 Collection Date: 11-Dec-2019 00:00

ANALYTICAL REPORT

WorkOrder:HS19120696
 Lab ID:HS19120696-08
 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD		Method:SW8260						
8260C								Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 13:04
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 13:04
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	16-Dec-2019 13:04
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 13:04
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 13:04
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 13:04
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 13:04
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	16-Dec-2019 13:04
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	16-Dec-2019 13:04
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	16-Dec-2019 13:04
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 13:04
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 13:04
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 13:04
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	16-Dec-2019 13:04
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 13:04
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	16-Dec-2019 13:04
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 13:04
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	16-Dec-2019 13:04
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 13:04
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	16-Dec-2019 13:04
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 13:04
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	16-Dec-2019 13:04
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 13:04
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	16-Dec-2019 13:04
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	16-Dec-2019 13:04
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 13:04
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	16-Dec-2019 13:04
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	16-Dec-2019 13:04
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 13:04
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	16-Dec-2019 13:04
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 13:04
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 13:04
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	16-Dec-2019 13:04
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	16-Dec-2019 13:04
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	16-Dec-2019 13:04
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	16-Dec-2019 13:04
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 13:04
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 13:04
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 13:04

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

ALS Houston, US

Date: 03-Jan-20

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP 18 24
 Sample ID: Trip Blank
 Collection Date: 11-Dec-2019 00:00

ANALYTICAL REPORT
 WorkOrder:HS19120696
 Lab ID:HS19120696-08
 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD		Method:SW8260						
8260C								Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 13:04
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 13:04
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	16-Dec-2019 13:04
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 13:04
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 13:04
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 13:04
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 13:04
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	UG/L	1	16-Dec-2019 13:04
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 13:04
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	16-Dec-2019 13:04
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	16-Dec-2019 13:04
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	16-Dec-2019 13:04
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 13:04
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 13:04
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 13:04
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 13:04
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 13:04
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 13:04
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 13:04
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 13:04
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 13:04
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 13:04
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 13:04
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 13:04
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 13:04
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>89.8</i>			<i>0</i>	<i>81-118</i>	<i>%REC</i>	<i>1</i>	<i>16-Dec-2019 13:04</i>
<i>Surr: 4-Bromofluorobenzene</i>	<i>98.3</i>			<i>0</i>	<i>85-114</i>	<i>%REC</i>	<i>1</i>	<i>16-Dec-2019 13:04</i>
<i>Surr: Dibromofluoromethane</i>	<i>92.6</i>			<i>0</i>	<i>80-119</i>	<i>%REC</i>	<i>1</i>	<i>16-Dec-2019 13:04</i>
<i>Surr: Toluene-d8</i>	<i>103</i>			<i>0</i>	<i>89-112</i>	<i>%REC</i>	<i>1</i>	<i>16-Dec-2019 13:04</i>

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

Weight / Prep Log

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19120696

Batch ID: 148814 **Start Date:** 17 Dec 2019 07:00 **End Date:** 17 Dec 2019 15:00
Method: SV AQ SEP FUN EXTRACT-LOWLEV - 3510C **Prep Code:** 3510_B_SIM

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19120696-02	1	1000 (mL)	1 (mL)	0.001
HS19120696-03	1	1000 (mL)	1 (mL)	0.001
HS19120696-04	1	1000 (mL)	1 (mL)	0.001
HS19120696-05	1	1000 (mL)	1 (mL)	0.001
HS19120696-07	1	1000 (mL)	1 (mL)	0.001

Batch ID: 149099 **Start Date:** 24 Dec 2019 10:30 **End Date:** 24 Dec 2019 12:30
Method: MERCURY PREP BY 7470A- WATER **Prep Code:** HG_WPR

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19120696-01		10 (mL)	10 (mL)	1
HS19120696-03		10 (mL)	10 (mL)	1
HS19120696-06		10 (mL)	10 (mL)	1

Batch ID: 149105 **Start Date:** 24 Dec 2019 12:00 **End Date:** 24 Dec 2019 16:00
Method: WATER - SW3010A **Prep Code:** 3010A

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19120696-01		10 (mL)	10 (mL)	1
HS19120696-03		10 (mL)	10 (mL)	1
HS19120696-06		10 (mL)	10 (mL)	1

ALS Houston, US

Date: 03-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19120696

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: 148814 (1)		Test Name : SEMIVOLATILES SIM			Matrix: Groundwater	
HS19120696-02	18CpTMW15_121119	11 Dec 2019 08:50		17 Dec 2019 07:00	20 Dec 2019 12:24	1
HS19120696-03	AWD4_121119	11 Dec 2019 09:45		17 Dec 2019 07:00	20 Dec 2019 12:43	1
HS19120696-04	18WW08_121119	11 Dec 2019 10:35		17 Dec 2019 07:00	20 Dec 2019 13:02	1
HS19120696-05	18CpTMW19_121119	11 Dec 2019 11:25		17 Dec 2019 07:00	20 Dec 2019 13:21	1
HS19120696-07	C03_121119	11 Dec 2019 13:10		17 Dec 2019 07:00	20 Dec 2019 13:40	1
Batch ID: 149099 (0)		Test Name : MERCURY BY SW7470A			Matrix: Groundwater	
HS19120696-01	18WW24_121119	11 Dec 2019 07:55		24 Dec 2019 10:30	24 Dec 2019 17:09	1
HS19120696-03	AWD4_121119	11 Dec 2019 09:45		24 Dec 2019 10:30	24 Dec 2019 17:10	1
HS19120696-06	18CpTMW18_121119	11 Dec 2019 12:15		24 Dec 2019 10:30	24 Dec 2019 17:12	1
Batch ID: 149105 (0)		Test Name : METALS BY ICPMS BY SW6020A			Matrix: Groundwater	
HS19120696-01	18WW24_121119	11 Dec 2019 07:55		24 Dec 2019 16:00	27 Dec 2019 15:12	20
HS19120696-01	18WW24_121119	11 Dec 2019 07:55		24 Dec 2019 16:00	27 Dec 2019 13:30	1
HS19120696-03	AWD4_121119	11 Dec 2019 09:45		24 Dec 2019 16:00	27 Dec 2019 13:32	1
HS19120696-06	18CpTMW18_121119	11 Dec 2019 12:15		24 Dec 2019 16:00	27 Dec 2019 15:14	20
HS19120696-06	18CpTMW18_121119	11 Dec 2019 12:15		24 Dec 2019 16:00	27 Dec 2019 13:37	1
Batch ID: R352668 (0)		Test Name : VOLATILES ORGANICS BY METHOD 8260C			Matrix: Water	
HS19120696-08	Trip Blank	11 Dec 2019 00:00			16 Dec 2019 13:04	1
Batch ID: R352668 (0)		Test Name : VOLATILES ORGANICS BY METHOD 8260C			Matrix: Groundwater	
HS19120696-01	18WW24_121119	11 Dec 2019 07:55			16 Dec 2019 13:28	1
HS19120696-02	18CpTMW15_121119	11 Dec 2019 08:50			16 Dec 2019 13:52	1
HS19120696-03	AWD4_121119	11 Dec 2019 09:45			16 Dec 2019 14:16	1
HS19120696-04	18WW08_121119	11 Dec 2019 10:35			16 Dec 2019 14:40	1
HS19120696-05	18CpTMW19_121119	11 Dec 2019 11:25			16 Dec 2019 15:04	1
HS19120696-06	18CpTMW18_121119	11 Dec 2019 12:15			16 Dec 2019 15:28	1
HS19120696-07	C03_121119	11 Dec 2019 13:10			16 Dec 2019 15:53	1
Batch ID: R353796 (0)		Test Name : SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)			Matrix: Groundwater	
HS19120696-01	18WW24_121119	11 Dec 2019 07:55			03 Jan 2020 14:21	1
HS19120696-02	18CpTMW15_121119	11 Dec 2019 08:50			03 Jan 2020 14:21	1
HS19120696-03	AWD4_121119	11 Dec 2019 09:45			03 Jan 2020 14:21	1
HS19120696-04	18WW08_121119	11 Dec 2019 10:35			03 Jan 2020 14:21	1
HS19120696-05	18CpTMW19_121119	11 Dec 2019 11:25			03 Jan 2020 14:21	1
HS19120696-06	18CpTMW18_121119	11 Dec 2019 12:15			03 Jan 2020 14:21	1
HS19120696-07	C03_121119	11 Dec 2019 13:10			03 Jan 2020 14:21	1

ALS Houston, US

Date: 03-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19120696

QC BATCH REPORT

Batch ID: 149099 (0)		Instrument: HG03		Method: MERCURY BY SW7470A						
MBLK	Sample ID: MBLK-149099	Units: mg/L		Analysis Date: 24-Dec-2019 17:00						
Client ID:	Run ID: HG03_353245	SeqNo: 5408656		PrepDate: 24-Dec-2019		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual	
Mercury	0.000100	0.000200							U	
LCS	Sample ID: LCS-149099	Units: mg/L		Analysis Date: 24-Dec-2019 17:02						
Client ID:	Run ID: HG03_353245	SeqNo: 5408657		PrepDate: 24-Dec-2019		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual	
Mercury	0.00500	0.000200	0.005	0	100	82 - 119				
MS	Sample ID: HS19120702-03MS	Units: mg/L		Analysis Date: 24-Dec-2019 17:05						
Client ID:	Run ID: HG03_353245	SeqNo: 5408659		PrepDate: 24-Dec-2019		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual	
Mercury	0.00495	0.000200	0.005	-0.000005000	99.1	82 - 119				
MSD	Sample ID: HS19120702-03MSD	Units: mg/L		Analysis Date: 24-Dec-2019 17:07						
Client ID:	Run ID: HG03_353245	SeqNo: 5408660		PrepDate: 24-Dec-2019		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual	
Mercury	0.00505	0.000200	0.005	-0.000005000	101	82 - 119	0.004950	2	20	
The following samples were analyzed in this batch:										
HS19120696-01 HS19120696-03 HS19120696-06										

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Date: 03-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19120696

QC BATCH REPORT

Batch ID: 149105 (0)		Instrument: ICPMS05		Method: METALS BY ICPMS BY SW6020A						
MBLK	Sample ID: MBLK-149105	Units: mg/L			Analysis Date: 27-Dec-2019 13:25					
Client ID:	Run ID: ICPMS05_353383	SeqNo: 5412799	PrepDate: 24-Dec-2019	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.004238	0.0100								J
Antimony	0.000500	0.00500								U
Arsenic	0.000500	0.00500								U
Barium	0.00250	0.00500								U
Beryllium	0.000500	0.00200								U
Cadmium	0.000500	0.00200								U
Calcium	0.05506	0.500								J
Chromium	0.000500	0.00500								U
Cobalt	0.000500	0.00500								U
Copper	0.00250	0.00500								U
Iron	0.1659	0.200								J
Lead	0.00100	0.00500								U
Magnesium	0.0500	0.200								U
Manganese	0.000962	0.00500								J
Nickel	0.00100	0.00500								U
Potassium	0.0500	0.200								U
Selenium	0.00250	0.00500								U
Silver	0.000500	0.00500								U
Sodium	0.0500	0.200								U
Thallium	0.000500	0.00200								U
Vanadium	0.00100	0.00500								U
Zinc	0.00250	0.00500								U

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Date: 03-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19120696

QC BATCH REPORT

Batch ID: 149105 (0)		Instrument: ICPMS05		Method: METALS BY ICPMS BY SW6020A						
LCS	Sample ID: LCS-149105	Units: mg/L			Analysis Date: 27-Dec-2019 14:33					
Client ID:	Run ID: ICPMS05_353383	SeqNo: 5412820		PrepDate: 24-Dec-2019		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
Aluminum	0.09227	0.0100	0.1	0	92.3	84 - 117				
Antimony	0.05171	0.00500	0.05	0	103	85 - 117				
Arsenic	0.05071	0.00500	0.05	0	101	84 - 116				
Barium	0.04742	0.00500	0.05	0	94.8	86 - 114				
Beryllium	0.04757	0.00200	0.05	0	95.1	83 - 121				
Cadmium	0.04941	0.00200	0.05	0	98.8	87 - 115				
Calcium	5.231	0.500	5	0	105	87 - 118				
Chromium	0.04905	0.00500	0.05	0	98.1	85 - 116				
Cobalt	0.04929	0.00500	0.05	0	98.6	86 - 115				
Copper	0.04986	0.00500	0.05	0	99.7	85 - 118				
Iron	5.023	0.200	5	0	100	87 - 118				
Lead	0.04781	0.00500	0.05	0	95.6	88 - 115				
Magnesium	5.31	0.200	5	0	106	83 - 118				
Manganese	0.04872	0.00500	0.05	0	97.4	87 - 115				
Nickel	0.05058	0.00500	0.05	0	101	85 - 117				
Potassium	5.146	0.200	5	0	103	87 - 115				
Selenium	0.0501	0.00500	0.05	0	100	80 - 120				
Silver	0.04799	0.00500	0.05	0	96.0	85 - 116				
Sodium	5.351	0.200	5	0	107	85 - 117				
Thallium	0.04462	0.00200	0.05	0	89.2	82 - 116				
Vanadium	0.04983	0.00500	0.05	0	99.7	86 - 115				
Zinc	0.05178	0.00500	0.05	0	104	83 - 119				

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Date: 03-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19120696

QC BATCH REPORT

Batch ID: 149105 (0)		Instrument: ICPMS05			Method: METALS BY ICPMS BY SW6020A					
MS	Sample ID: HS19120702-03MS	Units: mg/L			Analysis Date: 27-Dec-2019 16:20					
Client ID:	Run ID: ICPMS05_353383	SeqNo: 5412902		PrepDate: 24-Dec-2019		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.1096	0.0100	0.1	0.02447	85.2	84 - 117				
Antimony	0.05121	0.00500	0.05	0.000693	101	85 - 117				
Arsenic	0.05093	0.00500	0.05	0.0013	99.3	84 - 116				
Barium	0.9021	0.00500	0.05	1.115	-425	86 - 114				SO
Cadmium	0.04632	0.00200	0.05	0.0005	91.6	87 - 115				
Calcium	72.84	0.500	5	90.85	-360	87 - 118				SO
Chromium	0.5436	0.00500	0.05	0.6401	-193	85 - 116				SO
Cobalt	0.05631	0.00500	0.05	0.01007	92.5	86 - 115				
Copper	0.0567	0.00500	0.05	0.0109	91.6	85 - 118				
Lead	0.04614	0.00500	0.05	0	92.3	88 - 115				
Magnesium	31.35	0.200	5	33.71	-47.2	83 - 118				SO
Manganese	0.2371	0.00500	0.05	0.2568	-39.2	87 - 115				SO
Nickel	0.2751	0.00500	0.05	0.2826	-15.1	85 - 117				SO
Potassium	6.969	0.200	5	2.068	98.0	87 - 115				
Selenium	0.0481	0.00500	0.05	0	96.2	80 - 120				
Silver	0.04409	0.00500	0.05	0	88.2	85 - 116				
Sodium	353.2	0.200	5	417.6	-1290	85 - 117				SEO
Thallium	0.04258	0.00200	0.05	0	85.2	82 - 116				
Vanadium	0.05168	0.00500	0.05	0.003369	96.6	86 - 115				
Zinc	0.0596	0.00500	0.05	0.003288	113	83 - 119				

MS	Sample ID: HS19120702-03MS	Units: mg/L			Analysis Date: 27-Dec-2019 14:14					
Client ID:	Run ID: ICPMS05_353383	SeqNo: 5412813		PrepDate: 24-Dec-2019		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	0.05441	0.00200	0.05	-0.000001	109	83 - 121				
Iron	11.63	0.200	5	6.062	111	87 - 118				

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Date: 03-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19120696

QC BATCH REPORT

Batch ID: 149105 (0)		Instrument: ICPMS05		Method: METALS BY ICPMS BY SW6020A						
MSD	Sample ID: HS19120702-03MSD	Units: mg/L			Analysis Date: 27-Dec-2019 14:16					
Client ID:	Run ID: ICPMS05_353383	SeqNo: 5412814		PrepDate: 24-Dec-2019		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.131	0.0100	0.1	0.02447	107	84 - 117	0.1248	4.86	20	
Beryllium	0.05487	0.00200	0.05	-0.000001	110	83 - 121	0.05441	0.831	20	
Iron	11.43	0.200	5	6.062	107	87 - 118	11.63	1.74	20	
MSD	Sample ID: HS19120702-03MSD	Units: mg/L			Analysis Date: 27-Dec-2019 16:22					
Client ID:	Run ID: ICPMS05_353383	SeqNo: 5412903		PrepDate: 24-Dec-2019		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05219	0.00500	0.05	0.000693	103	85 - 117	0.05121	1.88	20	
Arsenic	0.0529	0.00500	0.05	0.0013	103	84 - 116	0.05093	3.8	20	
Barium	0.99	0.00500	0.05	1.115	-249	86 - 114	0.9021	9.3	20	SO
Cadmium	0.04901	0.00200	0.05	0.0005	97.0	87 - 115	0.04632	5.64	20	
Calcium	74.37	0.500	5	90.85	-330	87 - 118	72.84	2.07	20	SO
Chromium	0.5638	0.00500	0.05	0.6401	-153	85 - 116	0.5436	3.64	20	SO
Cobalt	0.05778	0.00500	0.05	0.01007	95.4	86 - 115	0.05631	2.58	20	
Copper	0.05693	0.00500	0.05	0.0109	92.0	85 - 118	0.0567	0.403	20	
Lead	0.04959	0.00500	0.05	0	99.2	88 - 115	0.04614	7.2	20	
Magnesium	32.11	0.200	5	33.71	-32.1	83 - 118	31.35	2.39	20	SO
Manganese	0.2455	0.00500	0.05	0.2568	-22.6	87 - 115	0.2371	3.46	20	SO
Nickel	0.2784	0.00500	0.05	0.2826	-8.52	85 - 117	0.2751	1.19	20	SO
Potassium	6.782	0.200	5	2.068	94.3	87 - 115	6.969	2.72	20	
Selenium	0.04645	0.00500	0.05	0	92.9	80 - 120	0.0481	3.5	20	
Silver	0.04697	0.00500	0.05	0	93.9	85 - 116	0.04409	6.33	20	
Sodium	355.3	0.200	5	417.6	-1250	85 - 117	353.2	0.58	20	SEO
Thallium	0.04625	0.00200	0.05	0	92.5	82 - 116	0.04258	8.27	20	
Vanadium	0.0527	0.00500	0.05	0.003369	98.7	86 - 115	0.05168	1.95	20	
Zinc	0.05108	0.00500	0.05	0.003288	95.6	83 - 119	0.0596	15.4	20	

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Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19120696

QC BATCH REPORT

Batch ID: 149105 (0)		Instrument: ICPMS05		Method: METALS BY ICPMS BY SW6020A						
PDS	Sample ID: HS19120702-03PDS	Units: mg/L			Analysis Date: 27-Dec-2019 14:19					
Client ID:	Run ID: ICPMS05_353383	SeqNo: 5412815		PrepDate: 24-Dec-2019		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual	
Antimony	0.08256	0.00500	0.1	0.000693	81.9	80 - 120				
Arsenic	0.0932	0.00500	0.1	0.0013	91.9	80 - 120				
Barium	1.135	0.00500	0.1	1.115	20.3	80 - 120			SO	
Cadmium	0.08881	0.00200	0.1	0.0005	88.3	80 - 120				
Calcium	94.39	0.500	10	90.85	35.5	80 - 120			SO	
Chromium	0.6802	0.00500	0.1	0.6401	40.2	80 - 120			SO	
Cobalt	0.09637	0.00500	0.1	0.01007	86.3	80 - 120				
Copper	0.09484	0.00500	0.1	0.0109	83.9	80 - 120				
Iron	14.45	0.200	10	6.062	83.8	80 - 120				
Lead	0.08693	0.00500	0.1	0.00013	86.8	80 - 120				
Potassium	10.8	0.200	10	2.068	87.3	80 - 120				
Selenium	0.086	0.00500	0.1	0.00011	85.9	80 - 120				
Silver	0.08364	0.00500	0.1	0.000013	83.6	80 - 120				
Thallium	0.08765	0.00200	0.1	0.000014	87.6	80 - 120				
Vanadium	0.09222	0.00500	0.1	0.003369	88.8	80 - 120				
Zinc	0.09081	0.00500	0.1	0.003288	87.5	80 - 120				
PDS	Sample ID: HS19120702-03PDS	Units: mg/L			Analysis Date: 27-Dec-2019 16:29					
Client ID:	Run ID: ICPMS05_353383	SeqNo: 5412906		PrepDate: 24-Dec-2019		DF: 10				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual	
Barium	1.989	0.0500	1	0.8967	109	80 - 120				
Calcium	179.2	5.00	100	74.05	105	80 - 120				
Chromium	1.633	0.0500	1	0.52	111	80 - 120				
Sodium	495.9	2.00	100	375.2	121	80 - 120			S	

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Date: 03-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19120696

QC BATCH REPORT

Batch ID: 149105 (0)		Instrument: ICPMS05		Method: METALS BY ICPMS BY SW6020A						
SD	Sample ID: HS19120702-03SD	Units: mg/L			Analysis Date: 27-Dec-2019 14:12					
Client ID:	Run ID: ICPMS05_353383	SeqNo: 5412812		PrepDate: 24-Dec-2019		DF: 5				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit Qual	
Aluminum	0.01228	0.0500					0.02447	0 10	J	
Antimony	0.00250	0.0250					0.000693	0 10	U	
Arsenic	0.00250	0.0250					0.0013	0 10	U	
Beryllium	0.00250	0.0100					-0.000001	0 10	U	
Cadmium	0.00250	0.0100					0.0005	0 10	U	
Cobalt	0.009437	0.0250					0.01007	0 10	J	
Copper	0.01067	0.0250					0.0109	0 10	J	
Iron	5.55	1.00					6.062	8.46 10		
Lead	0.00500	0.0250					0.00013	0 10	U	
Magnesium	31.48	1.00					33.71	6.62 10		
Manganese	0.2333	0.0250					0.2568	9.15 10		
Nickel	0.2685	0.0250					0.2826	4.99 10		
Potassium	1.943	1.00					2.068	6.03 10		
Selenium	0.0125	0.0250					0.00011	0 10	U	
Silver	0.00250	0.0250					0.000013	0 10	U	
Sodium	396.1	1.00					417.6	5.15 10		
Thallium	0.00250	0.0100					0.000014	0 10	U	
Vanadium	0.005733	0.0250					0.003369	0 10	J	
Zinc	0.0125	0.0250					0.003288	0 10	U	

SD	Sample ID: HS19120702-03SD	Units: mg/L			Analysis Date: 27-Dec-2019 16:26				
Client ID:	Run ID: ICPMS05_353383	SeqNo: 5412905		PrepDate: 24-Dec-2019		DF: 50			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit Qual
Barium	0.9191	0.250					0.8967	2.49 10	
Calcium	72.7	25.0					74.05	1.82 10	
Chromium	0.5425	0.250					0.52	4.32 10	
Sodium	379.9	10.0					375.2	1.26 10	

The following samples were analyzed in this batch: HS19120696-01 HS19120696-03 HS19120696-06

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Date: 03-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19120696

QC BATCH REPORT

Batch ID: 148814 (1)		Instrument: SV-6		Method: SEMIVOLATILES SIM						
MBLK	Sample ID: MBLK-148814	Units: ug/L			Analysis Date: 20-Dec-2019 08:55					
Client ID:	Run ID: SV-6_352996	SeqNo: 5406171		PrepDate: 17-Dec-2019		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
1,4-Dioxane	0.010	0.010							U	
<i>Surr: 2-Fluorobiphenyl</i>	<i>0.09654</i>	<i>0</i>	<i>0.08</i>	<i>0</i>	<i>121</i>	<i>40 - 140</i>				
<i>Surr: 4-Terphenyl-d14</i>	<i>0.09022</i>	<i>0</i>	<i>0.08</i>	<i>0</i>	<i>113</i>	<i>40 - 140</i>				
<i>Surr: Nitrobenzene-d5</i>	<i>0.08627</i>	<i>0</i>	<i>0.08</i>	<i>0</i>	<i>108</i>	<i>40 - 140</i>				
LCS	Sample ID: LCS1-148814	Units: ug/L			Analysis Date: 20-Dec-2019 09:14					
Client ID:	Run ID: SV-6_352996	SeqNo: 5406172		PrepDate: 17-Dec-2019		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
1,4-Dioxane	0.1101	0.010	0.08	0	138	40 - 140				
<i>Surr: 2-Fluorobiphenyl</i>	<i>0.09483</i>	<i>0</i>	<i>0.08</i>	<i>0</i>	<i>119</i>	<i>40 - 140</i>				
<i>Surr: 4-Terphenyl-d14</i>	<i>0.07915</i>	<i>0</i>	<i>0.08</i>	<i>0</i>	<i>98.9</i>	<i>40 - 140</i>				
<i>Surr: Nitrobenzene-d5</i>	<i>0.07534</i>	<i>0</i>	<i>0.08</i>	<i>0</i>	<i>94.2</i>	<i>40 - 140</i>				
LCSD	Sample ID: LCSD1-148814	Units: ug/L			Analysis Date: 20-Dec-2019 09:33					
Client ID:	Run ID: SV-6_352996	SeqNo: 5406173		PrepDate: 17-Dec-2019		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
1,4-Dioxane	0.1039	0.010	0.08	0	130	40 - 140	0.1101	5.76	20	
<i>Surr: 2-Fluorobiphenyl</i>	<i>0.07777</i>	<i>0</i>	<i>0.08</i>	<i>0</i>	<i>97.2</i>	<i>40 - 140</i>	<i>0.09483</i>	<i>19.8</i>	<i>20</i>	
<i>Surr: 4-Terphenyl-d14</i>	<i>0.07343</i>	<i>0</i>	<i>0.08</i>	<i>0</i>	<i>91.8</i>	<i>40 - 140</i>	<i>0.07915</i>	<i>7.49</i>	<i>20</i>	
<i>Surr: Nitrobenzene-d5</i>	<i>0.0755</i>	<i>0</i>	<i>0.08</i>	<i>0</i>	<i>94.4</i>	<i>40 - 140</i>	<i>0.07534</i>	<i>0.209</i>	<i>20</i>	
The following samples were analyzed in this batch:				HS19120696-02	HS19120696-03	HS19120696-04	HS19120696-05			
				HS19120696-07						

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Date: 03-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19120696

QC BATCH REPORT

Batch ID: R352668 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MBLK	Sample ID: VBLKW-191216	Units: UG/L			Analysis Date: 16-Dec-2019 12:40					
Client ID:	Run ID: VOA6_352668	SeqNo: 5394312	PrepDate:	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	0.50	1.0								U
1,1,1-Trichloroethane	0.50	1.0								U
1,1,2,2-Tetrachloroethane	0.50	1.0								U
1,1,2-Trichloroethane	0.50	1.0								U
1,1-Dichloroethane	0.50	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,1-Dichloropropene	0.50	1.0								U
1,2,3-Trichlorobenzene	0.50	1.0								U
1,2,3-Trichloropropane	0.50	1.0								U
1,2,4-Trichlorobenzene	0.50	1.0								U
1,2,4-Trimethylbenzene	0.50	1.0								U
1,2-Dibromo-3-chloropropane	0.50	1.0								U
1,2-Dibromoethane	0.50	1.0								U
1,2-Dichlorobenzene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
1,2-Dichloropropane	0.50	1.0								U
1,3,5-Trimethylbenzene	0.50	1.0								U
1,3-Dichlorobenzene	0.50	1.0								U
1,3-Dichloropropane	0.50	1.0								U
1,4-Dichlorobenzene	0.50	1.0								U
2,2-Dichloropropane	0.50	1.0								U
2-Butanone	1.0	2.0								U
2-Chlorotoluene	0.50	1.0								U
2-Hexanone	1.0	2.0								U
4-Chlorotoluene	0.50	1.0								U
4-Isopropyltoluene	0.50	1.0								U
4-Methyl-2-pentanone	1.0	2.0								U
Acetone	1.0	2.0								U
Benzene	0.50	1.0								U
Bromobenzene	0.50	1.0								U
Bromochloromethane	0.50	1.0								U
Bromodichloromethane	0.50	1.0								U
Bromoform	0.50	1.0								U
Bromomethane	0.50	1.0								U

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Date: 03-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19120696

QC BATCH REPORT

Batch ID: R352668 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MBLK	Sample ID: VBLKW-191216	Units: UG/L			Analysis Date: 16-Dec-2019 12:40					
Client ID:	Run ID: VOA6_352668	SeqNo: 5394312	PrepDate:	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	1.0	2.0								U
Carbon tetrachloride	0.50	1.0								U
Chlorobenzene	0.50	1.0								U
Chloroethane	0.50	1.0								U
Chloroform	0.50	1.0								U
Chloromethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
cis-1,3-Dichloropropene	0.50	1.0								U
Dibromochloromethane	0.50	1.0								U
Dibromomethane	0.50	1.0								U
Dichlorodifluoromethane	0.50	1.0								U
Ethylbenzene	0.50	1.0								U
Hexachlorobutadiene	0.50	1.0								U
Isopropylbenzene	0.50	1.0								U
m,p-Xylene	1.0	2.0								U
Methylene chloride	1.0	2.0								U
Naphthalene	0.50	1.0								U
n-Butylbenzene	0.50	1.0								U
n-Propylbenzene	0.50	1.0								U
o-Xylene	0.50	1.0								U
sec-Butylbenzene	0.50	1.0								U
Styrene	0.50	1.0								U
tert-Butylbenzene	0.50	1.0								U
Tetrachloroethene	0.50	1.0								U
Toluene	0.50	1.0								U
trans-1,2-Dichloroethene	0.50	1.0								U
trans-1,3-Dichloropropene	0.50	1.0								U
Trichloroethene	0.50	1.0								U
Trichlorofluoromethane	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	44.44	1.0	50	0	88.9	81 - 118				
Surr: 4-Bromofluorobenzene	48.93	1.0	50	0	97.9	85 - 114				
Surr: Dibromofluoromethane	46	1.0	50	0	92.0	80 - 119				
Surr: Toluene-d8	51.88	1.0	50	0	104	89 - 112				

ALS Houston, US

Date: 03-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19120696

QC BATCH REPORT

Batch ID: R352668 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
LCS	Sample ID: VLCSW-191216	Units: UG/L			Analysis Date: 16-Dec-2019 11:52					
Client ID:	Run ID: VOA6_352668	SeqNo: 5394311	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	18.75	1.0	20	0	93.7	78 - 124				
1,1,1-Trichloroethane	17.37	1.0	20	0	86.9	74 - 131				
1,1,2,2-Tetrachloroethane	18.92	1.0	20	0	94.6	71 - 121				
1,1,2-Trichloroethane	18.88	1.0	20	0	94.4	80 - 119				
1,1-Dichloroethane	19.95	1.0	20	0	99.7	77 - 125				
1,1-Dichloroethene	15.03	1.0	20	0	75.1	71 - 131				
1,1-Dichloropropene	17.34	1.0	20	0	86.7	78 - 125				
1,2,3-Trichlorobenzene	18.75	1.0	20	0	93.8	69 - 129				
1,2,3-Trichloropropane	19.14	1.0	20	0	95.7	73 - 122				
1,2,4-Trichlorobenzene	17.79	1.0	20	0	88.9	69 - 130				
1,2,4-Trimethylbenzene	18.8	1.0	20	0	94.0	76 - 124				
1,2-Dibromo-3-chloropropane	16.56	1.0	20	0	82.8	62 - 128				
1,2-Dibromoethane	18.34	1.0	20	0	91.7	77 - 121				
1,2-Dichlorobenzene	18.2	1.0	20	0	91.0	80 - 119				
1,2-Dichloroethane	18.39	1.0	20	0	92.0	73 - 128				
1,2-Dichloropropane	19.72	1.0	20	0	98.6	78 - 122				
1,3,5-Trimethylbenzene	18.78	1.0	20	0	93.9	75 - 124				
1,3-Dichlorobenzene	18.54	1.0	20	0	92.7	80 - 119				
1,3-Dichloropropane	19.01	1.0	20	0	95.0	80 - 119				
1,4-Dichlorobenzene	18.17	1.0	20	0	90.8	79 - 118				
2,2-Dichloropropane	17.95	1.0	20	0	89.7	60 - 139				
2-Butanone	36.88	2.0	40	0	92.2	56 - 143				
2-Chlorotoluene	20.23	1.0	20	0	101	79 - 122				
2-Hexanone	34.43	2.0	40	0	86.1	57 - 139				
4-Chlorotoluene	19.24	1.0	20	0	96.2	78 - 122				
4-Isopropyltoluene	17.53	1.0	20	0	87.7	77 - 127				
4-Methyl-2-pentanone	34.96	2.0	40	0	87.4	67 - 130				
Acetone	28.37	2.0	40	0	70.9	39 - 160				
Benzene	20.03	1.0	20	0	100	79 - 120				
Bromobenzene	19.67	1.0	20	0	98.3	80 - 120				
Bromochloromethane	19.67	1.0	20	0	98.3	78 - 123				
Bromodichloromethane	18.9	1.0	20	0	94.5	79 - 125				
Bromoform	17.37	1.0	20	0	86.9	66 - 130				
Bromomethane	16.9	1.0	20	0	84.5	53 - 141				

ALS Houston, US

Date: 03-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19120696

QC BATCH REPORT

Batch ID: R352668 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
LCS	Sample ID: VLCSW-191216	Units: UG/L			Analysis Date: 16-Dec-2019 11:52					
Client ID:	Run ID: VOA6_352668	SeqNo: 5394311	PrepDate:	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	40.94	2.0	40	0	102	64 - 133				
Carbon tetrachloride	16.06	1.0	20	0	80.3	72 - 136				
Chlorobenzene	18.57	1.0	20	0	92.8	82 - 118				
Chloroethane	15.36	1.0	20	0	76.8	60 - 138				
Chloroform	18.45	1.0	20	0	92.3	79 - 124				
Chloromethane	15.61	1.0	20	0	78.0	50 - 139				
cis-1,2-Dichloroethene	20.37	1.0	20	0	102	78 - 123				
cis-1,3-Dichloropropene	19.72	1.0	20	0	98.6	75 - 124				
Dibromochloromethane	18.83	1.0	20	0	94.1	74 - 126				
Dibromomethane	18.6	1.0	20	0	93.0	79 - 123				
Dichlorodifluoromethane	18.05	1.0	20	0	90.3	32 - 152				
Ethylbenzene	17.86	1.0	20	0	89.3	79 - 121				
Hexachlorobutadiene	19.07	1.0	20	0	95.3	66 - 134				
Isopropylbenzene	16.73	1.0	20	0	83.6	72 - 131				
m,p-Xylene	36.14	2.0	40	0	90.4	80 - 121				
Methylene chloride	19.9	2.0	20	0	99.5	74 - 124				
Naphthalene	15.94	1.0	20	0	79.7	61 - 128				
n-Butylbenzene	16.94	1.0	20	0	84.7	75 - 128				
n-Propylbenzene	18.46	1.0	20	0	92.3	76 - 126				
o-Xylene	18.1	1.0	20	0	90.5	78 - 122				
sec-Butylbenzene	17.31	1.0	20	0	86.6	77 - 126				
Styrene	18.17	1.0	20	0	90.9	78 - 123				
tert-Butylbenzene	17.81	1.0	20	0	89.1	78 - 124				
Tetrachloroethene	16.4	1.0	20	0	82.0	74 - 129				
Toluene	18.78	1.0	20	0	93.9	80 - 121				
trans-1,2-Dichloroethene	19.52	1.0	20	0	97.6	75 - 124				
trans-1,3-Dichloropropene	18.91	1.0	20	0	94.6	73 - 127				
Trichloroethene	18.48	1.0	20	0	92.4	79 - 123				
Trichlorofluoromethane	14.25	1.0	20	0	71.2	65 - 141				
Vinyl chloride	16.06	1.0	20	0	80.3	58 - 137				
Surr: 1,2-Dichloroethane-d4	46.78	1.0	50	0	93.6	81 - 118				
Surr: 4-Bromofluorobenzene	47.92	1.0	50	0	95.8	85 - 114				
Surr: Dibromofluoromethane	47.32	1.0	50	0	94.6	80 - 119				
Surr: Toluene-d8	45.5	1.0	50	0	91.0	89 - 112				

ALS Houston, US

Date: 03-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19120696

QC BATCH REPORT

Batch ID: R352668 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MS	Sample ID: HS19120702-03MS	Units: UG/L			Analysis Date: 16-Dec-2019 17:53					
Client ID:	Run ID: VOA6_352668	SeqNo: 5394324	PrepDate:	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	19.03	1.0	20	0	95.2	78 - 124				
1,1,1-Trichloroethane	17.84	1.0	20	0	89.2	74 - 131				
1,1,2,2-Tetrachloroethane	18.86	1.0	20	0	94.3	71 - 121				
1,1,2-Trichloroethane	18.75	1.0	20	0	93.7	80 - 119				
1,1-Dichloroethane	18.43	1.0	20	0	92.2	77 - 125				
1,1-Dichloroethene	15.37	1.0	20	0	76.8	71 - 131				
1,1-Dichloropropene	18.55	1.0	20	0	92.8	78 - 125				
1,2,3-Trichlorobenzene	18.51	1.0	20	0	92.6	69 - 129				
1,2,3-Trichloropropane	19.26	1.0	20	0	96.3	73 - 122				
1,2,4-Trichlorobenzene	18.37	1.0	20	0	91.9	69 - 130				
1,2,4-Trimethylbenzene	22.92	1.0	20	0	115	76 - 124				
1,2-Dibromo-3-chloropropane	18.43	1.0	20	0	92.1	62 - 128				
1,2-Dibromoethane	18.23	1.0	20	0	91.2	77 - 121				
1,2-Dichlorobenzene	19.46	1.0	20	0	97.3	80 - 119				
1,2-Dichloroethane	21.18	1.0	20	4.318	84.3	73 - 128				
1,2-Dichloropropane	18.6	1.0	20	0	93.0	78 - 122				
1,3,5-Trimethylbenzene	22.03	1.0	20	0	110	75 - 124				
1,3-Dichlorobenzene	20.73	1.0	20	0	104	80 - 119				
1,3-Dichloropropane	18.66	1.0	20	0	93.3	80 - 119				
1,4-Dichlorobenzene	20.07	1.0	20	0	100	79 - 118				
2,2-Dichloropropane	17.29	1.0	20	0	86.5	60 - 139				
2-Butanone	29.88	2.0	40	0	74.7	56 - 143				
2-Chlorotoluene	22.67	1.0	20	0	113	79 - 122				
2-Hexanone	32.07	2.0	40	0	80.2	57 - 139				
4-Chlorotoluene	21.44	1.0	20	0	107	78 - 122				
4-Isopropyltoluene	21.36	1.0	20	0	107	77 - 127				
4-Methyl-2-pentanone	33.71	2.0	40	0	84.3	67 - 130				
Acetone	18.36	2.0	40	0	45.9	39 - 160				
Benzene	20.3	1.0	20	0.8886	97.1	79 - 120				
Bromobenzene	20.84	1.0	20	0	104	80 - 120				
Bromochloromethane	17.41	1.0	20	0	87.1	78 - 123				
Bromodichloromethane	17.58	1.0	20	0	87.9	79 - 125				
Bromoform	16.82	1.0	20	0	84.1	66 - 130				
Bromomethane	13.57	1.0	20	0	67.8	53 - 141				

ALS Houston, US

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Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19120696

QC BATCH REPORT

Batch ID: R352668 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MS	Sample ID: HS19120702-03MS	Units: UG/L			Analysis Date: 16-Dec-2019 17:53					
Client ID:	Run ID: VOA6_352668	SeqNo: 5394324	PrepDate:	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	37.54	2.0	40	0	93.9	64 - 133				
Carbon tetrachloride	17.59	1.0	20	0	88.0	72 - 136				
Chlorobenzene	19.25	1.0	20	0	96.3	82 - 118				
Chloroethane	14.62	1.0	20	0	73.1	60 - 138				
Chloroform	19.07	1.0	20	2.244	84.1	79 - 124				
Chloromethane	14.5	1.0	20	0	72.5	50 - 139				
cis-1,2-Dichloroethene	21.81	1.0	20	3.183	93.1	78 - 123				
cis-1,3-Dichloropropene	18.51	1.0	20	0	92.5	75 - 124				
Dibromochloromethane	18.22	1.0	20	0	91.1	74 - 126				
Dibromomethane	16.95	1.0	20	0	84.8	79 - 123				
Dichlorodifluoromethane	17.78	1.0	20	0	88.9	32 - 152				
Ethylbenzene	20.11	1.0	20	0	101	79 - 121				
Hexachlorobutadiene	18.45	1.0	20	0	92.2	66 - 134				
Isopropylbenzene	19.75	1.0	20	0	98.8	72 - 131				
m,p-Xylene	40.45	2.0	40	0	101	80 - 121				
Methylene chloride	17.39	2.0	20	0	86.9	74 - 124				
Naphthalene	33.85	1.0	20	0	169	61 - 128				S
n-Butylbenzene	22.09	1.0	20	0	110	75 - 128				
n-Propylbenzene	22.59	1.0	20	0	113	76 - 126				
o-Xylene	19.68	1.0	20	0	98.4	78 - 122				
sec-Butylbenzene	21.81	1.0	20	0	109	77 - 126				
Styrene	18.94	1.0	20	0	94.7	78 - 123				
tert-Butylbenzene	21.9	1.0	20	0	109	78 - 124				
Tetrachloroethene	19.1	1.0	20	0	95.5	74 - 129				
Toluene	19.98	1.0	20	0	99.9	80 - 121				
trans-1,2-Dichloroethene	18.62	1.0	20	0	93.1	75 - 124				
trans-1,3-Dichloropropene	17.38	1.0	20	0	86.9	73 - 127				
Trichloroethene	287.6	1.0	20	270.6	85.1	79 - 123				EO
Trichlorofluoromethane	14.25	1.0	20	0	71.2	65 - 141				
Vinyl chloride	15.32	1.0	20	0	76.6	58 - 137				
Surr: 1,2-Dichloroethane-d4	44.87	1.0	50	0	89.7	81 - 118				
Surr: 4-Bromofluorobenzene	50.14	1.0	50	0	100	85 - 114				
Surr: Dibromofluoromethane	46.68	1.0	50	0	93.4	80 - 119				
Surr: Toluene-d8	50.51	1.0	50	0	101	89 - 112				

ALS Houston, US

Date: 03-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19120696

QC BATCH REPORT

Batch ID: R352668 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MSD	Sample ID: HS19120702-03MSD	Units: UG/L			Analysis Date: 16-Dec-2019 18:41					
Client ID:	Run ID: VOA6_352668	SeqNo: 5394326	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	18.07	1.0	20	0	90.3	78 - 124	19.03	5.18	20	
1,1,1-Trichloroethane	16.59	1.0	20	0	83.0	74 - 131	17.84	7.21	20	
1,1,2,2-Tetrachloroethane	18.26	1.0	20	0	91.3	71 - 121	18.86	3.24	20	
1,1,2-Trichloroethane	18.41	1.0	20	0	92.0	80 - 119	18.75	1.82	20	
1,1-Dichloroethane	17.66	1.0	20	0	88.3	77 - 125	18.43	4.26	20	
1,1-Dichloroethene	14.27	1.0	20	0	71.4	71 - 131	15.37	7.41	20	
1,1-Dichloropropene	17.4	1.0	20	0	87.0	78 - 125	18.55	6.4	20	
1,2,3-Trichlorobenzene	15.53	1.0	20	0	77.7	69 - 129	18.51	17.5	20	
1,2,3-Trichloropropane	18.2	1.0	20	0	91.0	73 - 122	19.26	5.67	20	
1,2,4-Trichlorobenzene	15.56	1.0	20	0	77.8	69 - 130	18.37	16.6	20	
1,2,4-Trimethylbenzene	19.23	1.0	20	0	96.2	76 - 124	22.92	17.5	20	
1,2-Dibromo-3-chloropropane	15.98	1.0	20	0	79.9	62 - 128	18.43	14.2	20	
1,2-Dibromoethane	17.48	1.0	20	0	87.4	77 - 121	18.23	4.21	20	
1,2-Dichlorobenzene	17.63	1.0	20	0	88.2	80 - 119	19.46	9.87	20	
1,2-Dichloroethane	20.42	1.0	20	4.318	80.5	73 - 128	21.18	3.66	20	
1,2-Dichloropropane	17.77	1.0	20	0	88.9	78 - 122	18.6	4.53	20	
1,3,5-Trimethylbenzene	19.47	1.0	20	0	97.3	75 - 124	22.03	12.4	20	
1,3-Dichlorobenzene	18.41	1.0	20	0	92.0	80 - 119	20.73	11.9	20	
1,3-Dichloropropane	18.34	1.0	20	0	91.7	80 - 119	18.66	1.74	20	
1,4-Dichlorobenzene	18.09	1.0	20	0	90.5	79 - 118	20.07	10.4	20	
2,2-Dichloropropane	16.06	1.0	20	0	80.3	60 - 139	17.29	7.4	20	
2-Butanone	30.21	2.0	40	0	75.5	56 - 143	29.88	1.09	20	
2-Chlorotoluene	20.43	1.0	20	0	102	79 - 122	22.67	10.4	20	
2-Hexanone	31.67	2.0	40	0	79.2	57 - 139	32.07	1.26	20	
4-Chlorotoluene	19.38	1.0	20	0	96.9	78 - 122	21.44	10.1	20	
4-Isopropyltoluene	18.51	1.0	20	0	92.6	77 - 127	21.36	14.3	20	
4-Methyl-2-pentanone	33.27	2.0	40	0	83.2	67 - 130	33.71	1.32	20	
Acetone	19.37	2.0	40	0	48.4	39 - 160	18.36	5.37	20	
Benzene	19.21	1.0	20	0.8886	91.6	79 - 120	20.3	5.54	20	
Bromobenzene	19.05	1.0	20	0	95.3	80 - 120	20.84	8.95	20	
Bromochloromethane	16.93	1.0	20	0	84.6	78 - 123	17.41	2.83	20	
Bromodichloromethane	16.91	1.0	20	0	84.6	79 - 125	17.58	3.86	20	
Bromoform	16.74	1.0	20	0	83.7	66 - 130	16.82	0.463	20	
Bromomethane	12.74	1.0	20	0	63.7	53 - 141	13.57	6.26	20	

ALS Houston, US

Date: 03-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19120696

QC BATCH REPORT

Batch ID: R352668 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MSD	Sample ID: HS19120702-03MSD	Units: UG/L			Analysis Date: 16-Dec-2019 18:41					
Client ID:	Run ID: VOA6_352668	SeqNo: 5394326		PrepDate:		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	35.31	2.0	40	0	88.3	64 - 133	37.54	6.12	20	
Carbon tetrachloride	16.31	1.0	20	0	81.5	72 - 136	17.59	7.59	20	
Chlorobenzene	17.84	1.0	20	0	89.2	82 - 118	19.25	7.58	20	
Chloroethane	14.32	1.0	20	0	71.6	60 - 138	14.62	2.11	20	
Chloroform	18.35	1.0	20	2.244	80.6	79 - 124	19.07	3.82	20	
Chloromethane	13.85	1.0	20	0	69.3	50 - 139	14.5	4.58	20	
cis-1,2-Dichloroethene	20.93	1.0	20	3.183	88.7	78 - 123	21.81	4.13	20	
cis-1,3-Dichloropropene	17.54	1.0	20	0	87.7	75 - 124	18.51	5.35	20	
Dibromochloromethane	17.71	1.0	20	0	88.5	74 - 126	18.22	2.86	20	
Dibromomethane	16.66	1.0	20	0	83.3	79 - 123	16.95	1.78	20	
Dichlorodifluoromethane	17.16	1.0	20	0	85.8	32 - 152	17.78	3.54	20	
Ethylbenzene	18.46	1.0	20	0	92.3	79 - 121	20.11	8.56	20	
Hexachlorobutadiene	16.29	1.0	20	0	81.5	66 - 134	18.45	12.4	20	
Isopropylbenzene	17.99	1.0	20	0	89.9	72 - 131	19.75	9.36	20	
m,p-Xylene	37.06	2.0	40	0	92.7	80 - 121	40.45	8.75	20	
Methylene chloride	17.12	2.0	20	0	85.6	74 - 124	17.39	1.53	20	
Naphthalene	15.28	1.0	20	0	76.4	61 - 128	33.85	75.6	20	R
n-Butylbenzene	18.24	1.0	20	0	91.2	75 - 128	22.09	19.1	20	
n-Propylbenzene	19.64	1.0	20	0	98.2	76 - 126	22.59	14	20	
o-Xylene	18.22	1.0	20	0	91.1	78 - 122	19.68	7.69	20	
sec-Butylbenzene	18.91	1.0	20	0	94.5	77 - 126	21.81	14.2	20	
Styrene	18.03	1.0	20	0	90.1	78 - 123	18.94	4.94	20	
tert-Butylbenzene	19.28	1.0	20	0	96.4	78 - 124	21.9	12.7	20	
Tetrachloroethene	17.51	1.0	20	0	87.6	74 - 129	19.1	8.66	20	
Toluene	18.61	1.0	20	0	93.0	80 - 121	19.98	7.13	20	
trans-1,2-Dichloroethene	17.68	1.0	20	0	88.4	75 - 124	18.62	5.2	20	
trans-1,3-Dichloropropene	16.85	1.0	20	0	84.3	73 - 127	17.38	3.06	20	
Trichloroethene	268.7	1.0	20	270.6	-9.54	79 - 123	287.6	6.81	20	SEO
Trichlorofluoromethane	13.54	1.0	20	0	67.7	65 - 141	14.25	5.06	20	
Vinyl chloride	14.65	1.0	20	0	73.3	58 - 137	15.32	4.44	20	
Surr: 1,2-Dichloroethane-d4	45.95	1.0	50	0	91.9	81 - 118	44.87	2.38	20	
Surr: 4-Bromofluorobenzene	50.11	1.0	50	0	100	85 - 114	50.14	0.0703	20	
Surr: Dibromofluoromethane	46.37	1.0	50	0	92.7	80 - 119	46.68	0.662	20	
Surr: Toluene-d8	50.26	1.0	50	0	101	89 - 112	50.51	0.491	20	

ALS Houston, US

Date: 03-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19120696

QC BATCH REPORT**Batch ID:** R352668 (0)**Instrument:** VOA6**Method:** VOLATILES ORGANICS BY METHOD
8260C

The following samples were analyzed in this batch:

HS19120696-01	HS19120696-02	HS19120696-03	HS19120696-04
HS19120696-05	HS19120696-06	HS19120696-07	HS19120696-08

ALS Houston, US

Date: 03-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19120696

**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 Quantitation 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	19-028-0	27-Mar-2020
California	2919, 2019-2020	30-Apr-2020
Dept of Defense	ANAB L2231	20-Dec-2021
Florida	E87611-28	30-Jun-2020
Illinois	2000322019-2	09-May-2020
Kansas	E-10352 2019-2020	31-Jul-2020
Kentucky	123043, 2019-2020	30-Apr-2020
Louisiana	03087, 2019-2020	30-Jun-2020
Maryland	343, 2019-2020	30-Jun-2020
North Dakota	R-193 2019-2020	30-Apr-2020
Oklahoma	2019-067	31-Aug-2020
Texas	TX104704231-19-23	30-Apr-2020

Sample Receipt Checklist

Client Name: Bhate Environmental
 Work Order: HS19120696

Date/Time Received: **12-Dec-2019 09:05**
 Received by: **JRM**

Checklist completed by: Sonia West 13-Dec-2019
 eSignature Date

Reviewed by: RJ Modashia 16-Dec-2019
 eSignature Date

Matrices: **Groundwater/Water**

Carrier name: **FedEx Standard 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): 2.1/2.1C IR 25
 Cooler(s)/Kit(s): 45575
 Date/Time sample(s) sent to storage: 12-12-19 8:30 PM

- 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:



1608 13th Avenue South, Suite 300
 Birmingham Alabama 35205
 Tel: 205-918-4000
 Fax: 205-918-4050

Chain of Custody and Analytical Request

HS19120696

Bhate Environmental Associates, Inc.
 LHAAP 18 24



Facility/Base I.D.: LHAAP

Sample Analysis Requested ⁽⁵⁾

Project/Site Name: LHAAP / Site 18/24

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	VOC	PERCHLORATE	TOTAL METALS	1,4 - DIOXANE	Ambient Blank Lot Control Number	Equipment Blank Lot Control Number	Trip Blank Lot Control Number	Coder ID
18ww24-121119	11 DEC 2019	0755	-	N		WG	5	X	X	X					
18cptomw15-121119	11 DEC 2019	0850	-	N		WG	5	X	X		X				
AWD4-121119	11 DEC 2019	0945	-	N		WG	6	X	X	X	X				
18ww08-121119	11 DEC 2019	1035	-	N		WG	5	X	X		X				
18cptomw19-121119	11 DEC 2019	1125	-	N		WG	5	X	X		X				
18cptomw18-121119	11 DEC 2019	1215	-	N		WG	6	X	X	X	X				
CO3-121119	11 DEC 2019	1310	-	N		WG	5	X	X		X				
TRIP BLANK	11 DEC 2019		-	TB		W	2	X							

COMMENTS:

Relinquished By (signed)			Date	Time	Received by (signed)			Date	Time
[Signature]			12/11/19	1430	[Signature]			12/12/19	9:05
2. _____					3. _____				
3. _____					4. _____				

Sample Delivery Details / Laboratory Receipt

Delivered Directly to Lab: FedEx Shipped: _____

Method of Shipment: _____

Fed Ex Airbill


Analytical Lab: ALS 10450 Stancliff Rd, Suite 210 Houston, TX 77099 (281) 530-5656

Lab Recipient: _____ Delivery Date/Time: _____

45575
201 FR25 No.:
Number: C/K-0


ATTN: SONIA WEST

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

 ALS 10450 Stancliff Rd., Suite 210 Houston, Texas 77099 Tel. +1 281 530 5656 Fax. +1 281 530 5887	CUSTODY SEAL		Seal Broken By:
	Date: 12/11/19	Time: 1430	<i>SM</i>
	Name: Scott Bessinger	Company: BH&A	Date: 12/12/19

45575 DEC 12 2019

**Must Deliver Next Business Day
Time and Temperature Sensitive!**

 45575

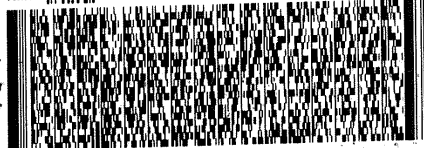
ORIGIN ID: SGRA (903) 930-6193
 SCOTT BESSINGER
 BH&E ENVIRONMENTAL ASSOCIATES
 1203-B EAST GRAND AVE. PMB202
 MARSHALL, TX 75670
 UNITED STATES US

SHIP DATE: 02DEC19
 ACTWT: 1.00 LB MAN
 CAD: 300130/CAFE3211
 DIMS: 26x14x14 IN


TO **CLIENT SERVICES**
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON TX 77099

(281) 530-5656
 REF: LHAAP - 18/24 - BO 66900 - RJ

RMA: ||| ||| |||



FedEx
Express



redExx.
 TRK# 1251 0292 4210
 0221

THU - 12 DEC 10:30A
PRIORITY OVERNIGHT

AB SGRA

77099
TX-US
IAH



FID 5195800 11DEC19 GGGA 56AC2/180D/85A2



Case Narrative

Method: 6850
Analysis: Perchlorate
Analysis SOP: LC-MS-CLO4
ALS WO ID(s): 1935354

Client: ALS Laboratories (Houston, TX)
Matrix: Water
ELMS Batch (HBN): 2334 (254594)

General Set Information: There were seven field samples in this Work Order. The samples were analyzed for perchlorate.

Method Summary: Each sample was prepared as noted below and analyzed using an Agilent 1100 LC/MSD system in select ion monitoring (SIM) mode at m/z 83 and 85, which corresponds to the loss of one oxygen atom from the perchlorate molecule. ChemStation software was used for instrument control and data analysis. The ion ratio of m/z 83 to 85 was used to positively identify the response peak as perchlorate. Quantitation was performed using the m/z 83 peak area. An internal standard (ISTD) of ^{18}O labeled perchlorate was added to each sample to establish the perchlorate peak retention time and used in quantitation.

Sample Preparation: A 10.0mL aliquot of each sample was transferred into a 15-mL centrifuge tube. 50 μL of an ^{18}O labeled perchlorate solution was added to each sample as an internal standard. The samples were then capped, vortexed, and filtered into autosampler vial using Phenex PES membrane 0.45 μm Syringe filters.

Holding Times: Holding times were met for all analyses.

Dilutions: Field samples 1935354003/04 were analyzed and reported from 1:100 dilutions. The reporting limits have been adjusted accordingly.

Method QC data: The method blank (LMB 690525) was less than 1/2 the CRDL. The recovery for the LCS (690522) was within acceptable parameters.



MS/MSD Analysis: MS/MSD was performed on sample 1935354001 (Client ID: 18WW24_121119). 3.0 μ L of Working Standard Solution Horizon ID 49947 was added to 10.0mL of sample preparation. The spike target was 3. μ g/L. The MS/MSD percent recoveries and relative percent difference (RPD) were within the performance limits.

Instrument QC: Instrument initial and continuing calibrations were performed in accordance with published procedures.

NC/CAR(s): NA

Sample Calculation: Samples were reported in μ g/L. Results were calculated in μ g/L by the equation $(A) \times (B)$,

where: A = Analyte concentration from the standard curve (μ g/L)

B = Dilution performed at time of analysis

Miscellaneous Comments: These samples were analyzed in accordance with the requirements found in the DOD QSM Version 5.1.1. Sample 1935354006 failed the 50-150% method requirement for ISTD recovery. This sample was re-prepped, re-analyzed and reported. The Reporting Limit Verification Standard (RLVS – 690523) is reported from the analysis of the Laboratory Control Sample (LCS – 690522) at a level of 3.0 μ g/L. Due to limitations of the Chemstation Software, some of the chromatographic peaks may require manual integrations. A manual integration was performed for one of the Initial Calibration analyses (datafile: 20SEPI03).

Thomas Bosch January 03, 2020
Analyst Date



ANALYTICAL REPORT

Report Date: January 03, 2020

RJ Modashia
 ALS Environmental (Houston)
 10450 Stancliff Road
 Suite 210
 Houston, TX 77099

Phone: 281 530-5656

E-mail: RJ.Modashia@ALSGlobal.com

Workorder: **34-1935354**

Project ID: HS19120696

Purchase Order: HS19120696

Project Manager Kevin W. Griffiths

Client Sample ID	Lab ID	Collect Date	Receive Date	Sampling Site
18WW24_121119	1935354001	12/11/19	12/17/19	
18CpTMW15_121119	1935354002	12/11/19	12/17/19	
AWD4_121119	1935354003	12/11/19	12/17/19	
18WW08_121119	1935354004	12/11/19	12/17/19	
18CpTMW19_121119	1935354005	12/11/19	12/17/19	
18CpTMW18_121119	1935354006	12/11/19	12/17/19	
C03_121119	1935354007	12/11/19	12/17/19	

ADDRESS 960 West LeVoy Drive, Salt Lake City, Utah, 84123 USA | PHONE +1 801 266 7700 | FAX +1 801 268 9992

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Environmental 

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RIGHT SOLUTIONS RIGHT PARTNER

49 of 134



ANALYTICAL REPORT

Workorder: 34-1935354

Client: ALS Environmental
(Houston)

Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: 18WW24_121119	Sampling Site: NA	Collected: 12/11/2019				
Lab ID: 1935354001	Media: 125 mL Nalgene	Received: 12/17/2019				
Matrix: Water	Sampling Parameter: NA					
Analysis Method - EPA 6850, DoD QSM						
Preparation: Not Applicable	Analysis: EPA 6850, DoD QSM Water Batch: ELMS/2334 (HBN: 254594) Analyzed: 12/31/2019 09:12	Instrument ID: LCMS04 %Solids: NA Report Basis: Wet				
Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Sample ID: 18CpTMW15_121119	Sampling Site: NA	Collected: 12/11/2019				
Lab ID: 1935354002	Media: 125 mL Nalgene	Received: 12/17/2019				
Matrix: Water	Sampling Parameter: NA					
Analysis Method - EPA 6850, DoD QSM						
Preparation: Not Applicable	Analysis: EPA 6850, DoD QSM Water Batch: ELMS/2334 (HBN: 254594) Analyzed: 12/31/2019 09:54	Instrument ID: LCMS04 %Solids: NA Report Basis: Wet				
Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	2.5	1.0	2.0	4.0	1	J

Sample ID: AWD4_121119	Sampling Site: NA	Collected: 12/11/2019				
Lab ID: 1935354003	Media: 125 mL Nalgene	Received: 12/17/2019				
Matrix: Water	Sampling Parameter: NA					
Analysis Method - EPA 6850, DoD QSM						
Preparation: Not Applicable	Analysis: EPA 6850, DoD QSM Water Batch: ELMS/2334 (HBN: 254594) Analyzed: 12/31/2019 10:07	Instrument ID: LCMS04 %Solids: NA Report Basis: Wet				
Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	410	100	200	400	100	

Sample ID: 18WW08_121119	Sampling Site: NA	Collected: 12/11/2019				
Lab ID: 1935354004	Media: 125 mL Nalgene	Received: 12/17/2019				
Matrix: Water	Sampling Parameter: NA					
Analysis Method - EPA 6850, DoD QSM						
Preparation: Not Applicable	Analysis: EPA 6850, DoD QSM Water Batch: ELMS/2334 (HBN: 254594) Analyzed: 12/31/2019 11:17	Instrument ID: LCMS04 %Solids: NA Report Basis: Wet				
Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	3200	100	200	400	100	



ANALYTICAL REPORT

Workorder: 34-1935354

Client: ALS Environmental
(Houston)

Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: 18CpTMW19_121119	Sampling Site: NA	Collected: 12/11/2019				
Lab ID: 1935354005	Media: 125 mL Nalgene	Received: 12/17/2019				
Matrix: Water	Sampling Parameter: NA					
Analysis Method - EPA 6850, DoD QSM						
Preparation: Not Applicable	Analysis: EPA 6850, DoD QSM Water Batch: ELMS/2334 (HBN: 254594) Analyzed: 12/31/2019 10:35	Instrument ID: LCMS04 %Solids: NA Report Basis: Wet				
Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	27	1.0	2.0	4.0	1	

Sample ID: 18CpTMW18_121119	Sampling Site: NA	Collected: 12/11/2019				
Lab ID: 1935354006	Media: 125 mL Nalgene	Received: 12/17/2019				
Matrix: Water	Sampling Parameter: NA					
Analysis Method - EPA 6850, DoD QSM						
Preparation: Not Applicable	Analysis: EPA 6850, DoD QSM Water Batch: ELMS/2334 (HBN: 254594) Analyzed: 12/31/2019 11:31	Instrument ID: LCMS04 %Solids: NA Report Basis: Wet				
Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Sample ID: C03_121119	Sampling Site: NA	Collected: 12/11/2019				
Lab ID: 1935354007	Media: 125 mL Nalgene	Received: 12/17/2019				
Matrix: Water	Sampling Parameter: NA					
Analysis Method - EPA 6850, DoD QSM						
Preparation: Not Applicable	Analysis: EPA 6850, DoD QSM Water Batch: ELMS/2334 (HBN: 254594) Analyzed: 12/31/2019 11:03	Instrument ID: LCMS04 %Solids: NA Report Basis: Wet				
Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	15	1.0	2.0	4.0	1	

Comments

Quality Control: EPA 6850, DoD QSM - (HBN: 254594)

Field samples 1935354003/04 were analyzed and reported from 1:100 dilutions. The reporting limits have been adjusted accordingly.

Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Method	Analyst	Peer Review
EPA 6850, DoD QSM	/S/ Thomas Bosch 01/02/2020 11:16	/S/ Stephen Brose 01/03/2020 11:53



ANALYTICAL REPORT

Workorder: 34-1935354

Client: ALS Environmental
(Houston)

Project Manager: Kevin W. Griffiths

Laboratory Contact Information

ALS Environmental
960 W Levoy Drive
Salt Lake City, Utah 84123Phone: (801) 266-7700
Email: als.lt.lab@ALSGlobal.com
Web: www.alslc.com

General Lab Comments

The results provided in this report relate only to the items tested.
 Samples were received in acceptable condition unless otherwise noted.
 Samples have not been blank corrected unless otherwise noted.
 This test report shall not be reproduced, except in full, without written approval of ALS.

ALS provides professional analytical services for all samples submitted. ALS is not in a position to interpret the data and assumes no responsibility for the quality of the samples submitted.

All quality control samples processed with the samples in this report yielded acceptable results unless otherwise noted.

ALS is accredited for specific fields of testing (scopes) in the following testing sectors. The quality system implemented at ALS conforms to accreditation requirements and is applied to all analytical testing performed by ALS. The following table lists testing sector, accreditation body, accreditation number and website. Please contact these accrediting bodies or your ALS project manager for the current scope of accreditation that applies to your analytical testing.

Testing Sector	Accreditation Body (Standard)	Certificate Number	Website
Environmental	PJLA (DoD ELAP)	L17-506	http://www.pjllabs.com
	PJLA (ISO 17025)	L17-507-R1	http://www.pjllabs.com
	Utah (TNI)	UT00953	http://lams.nelac-institute.org/search
	Iowa (TNI)	IA# 376	http://www.shl.uiowa.edu/labcert/idnr/
	Kansas	E-10416	http://www.kdheks.gov/envlab/disclaimer.html
Industrial Hygiene	AIHA (ISO 17025 & AIHA IHLAP)	101574	http://www.aihaaccreditedlabs.org
	DOECAP-AP	L18-606	http://www.pjllabs.com
	Washington	C596	https://ecology.wa.gov/Regulations-Permits/Permits-certifications/Laboratory-Accreditation
Dietary Supplements	PJLA (ISO 17025)	L17-507-R1	http://www.pjllabs.com

Result Symbol Definitions

MDL = Method Detection Limit, a statistical estimate of method/media/instrument sensitivity.

RL = Reporting Limit, a verified value of method/media/instrument sensitivity.

CRDL = Contract Required Detection Limit

Reg. Limit = Regulatory Limit.

ND = Not Detected, testing result not detected above the MDL or RL.

< Means this testing result is less than the numerical value.

** No result could be reported, see sample comments for details.

Qualifier Symbol Definitions

U = Qualifier indicates that the analyte was not detected above the MDL.

J = Qualifier Indicates that the analyte value is between the MDL and the RL. It is also used to indicate an estimated value for tentatively identified compounds in mass spectrometry where a 1:1 response is assumed.

B = Qualifier indicates that the analyte was detected in the blank.

E = Qualifier indicates that the analyte result exceeds calibration range.

P = Qualifier indicates that the RPD between the two columns is greater than 40%.



Quality Control Sample Batch Report

00957851

Analysis Information

Workorder: 1935354

Limits: Client SOW/Contract Specified
Basis: DoD QSM

Preparation: NA
Batch: NA
Prepared By: NA

Analysis: EPA 6850, DoD QSM
Batch: ELMS/2334 (HBN: 254594)
Analyzed By: Thomas Bosch

Blank

LMB: 690525 Analyzed: 12/31/2019 08:58 Units: ug/L			
Analyte	Result	MDL	RL
Perchlorate	ND	1	2.00

Laboratory Control Sample

LCS: 690522 Analyzed: 12/31/2019 08:30 Dilution: 1 Units: ug/L				
Analyte	Result	Target	% Rec	QC Limits
Perchlorate	3.30	3.00	110	78.8 123.8

Matrix Spike - Matrix Spike Duplicate

Sample: 1935354001 Analyzed: 12/31/2019 09:12 Dilution: 1 Units: ug/L		MS: 690526 Analyzed: 12/31/2019 09:26 Dilution: 1 Units: ug/L				MSD: 690527 Analyzed: 12/31/2019 09:40 Dilution: 1 Units: ug/L			
Analyte	Result	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits
Perchlorate	ND	3.13	3	104	78.8 123.8	3.18	106	1.35	0.0 20.0

Comments

Field samples 1935354003/04 were analyzed and reported from 1:100 dilutions. The reporting limits have been adjusted accordingly.

QC Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Analyst	Peer Review
/S/ Thomas Bosch 01/02/2020 12:19	/S/ Stephen Brose 01/03/2020 11:53

Symbols and Definitions

- | | |
|--|---|
| <ul style="list-style-type: none"> * - Analyte above reporting limit or outside of control limits ▲ - Sample result is greater than 4 times the spike added ● - Sample and Matrix Duplicate less than 5 times the reporting limit ● - Result is above the calibration range # - The Matrix Spike, Matrix Spike duplicate or Matrix Duplicate is reported for your information only. The sample matrix may be inappropriate for the method selected. | <ul style="list-style-type: none"> RPD - Relative % Difference (Spike / Spike Duplicate) ND - Not Detected (U - Qualifier also flags analyte as not detected) NA - Not Applicable QC results are not adjusted for moisture correction, where applicable |
|--|---|



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

18698/#2

SAMPLING STATE: Texas

COC ID: 12852

SUBCONTRACT TO:

ALS Laboratory Group
960 LeVoy Dr
Salt Lake City, UT 84123

1935354

Phone: +1 801 266 7700

CUSTOMER INFORMATION:

Company: ALS Houston
Contact: RJ Modashia
Address: 10450 Stancliff Rd, Ste 210
Phone: +1 281 530 5656
Email: RJ.Modashia@alsglobal.com
Alternate Contact: Jumoke M. Lawal
Email: jumoke.lawal@alsglobal.com

INVOICE INFORMATION:

Company: ALS Houston
Contact: Accounts Payable
Address: 10450 Stancliff Rd, Ste 210
Phone: +1 281 530 5656
Reference: HS19120696
TSR: Danielle Winnings

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	HS19120696-01	18WW24_121119	Groundwater	11 Dec 2019 07:55
	SUB_Perch-6850			27 Dec 2019
2.	HS19120696-02	18CpTMW15_121119	Groundwater	11 Dec 2019 08:50
	SUB_Perch-6850			27 Dec 2019
3.	HS19120696-03	AWD4_121119	Groundwater	11 Dec 2019 09:45
	SUB_Perch-6850			27 Dec 2019
4.	HS19120696-04	18WW08_121119	Groundwater	11 Dec 2019 10:35
	SUB_Perch-6850			27 Dec 2019
5.	HS19120696-05	18CpTMW19_121119	Groundwater	11 Dec 2019 11:25
	SUB_Perch-6850			27 Dec 2019
6.	HS19120696-06	18CpTMW18_121119	Groundwater	11 Dec 2019 12:15
	SUB_Perch-6850			27 Dec 2019
7.	HS19120696-07	C03_121119	Groundwater	11 Dec 2019 13:10
	SUB_Perch-6850			27 Dec 2019

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

RIGHT SOLUTIONS | RIGHT PARTNER



Subcontract Chain of Custody

SAMPLING STATE: Texas

COC ID: 12852

QC Level: DOD IV (DoD Data Package)

Relinquished By:

[Handwritten Signature]

Date/Time:

12/16/19 1800

Received By:

[Handwritten Signature]

Date/Time:

12/17/19 900

Cooler ID(s):

NA

Temperature(s):

900 2

[Handwritten Signature]

ALS-SALT LAKE CITY-RELATED INFORMATION REPORT (CRIR)

COOLER OR CONTAINER INFORMATION CHECKLIST (Fill In or Circle)

Client Name: <u>ALS Houston</u>		Project/Task/Site: _____						
Date/Time of Receipt: <u>12/17/19 900</u>		Number of Coolers Received: <u>1</u> <u>1935354</u>						
Condition of Coolers: <u>Acceptable/Unacceptable</u>		Temperature Control: <u>Present/Not Included</u>						
Cooler Custody Seals: <u>Present/Absent/NA</u>		Location Temp Taken: <u>Control/Between Samples</u>						
Container Custody Seals: <u>Present/Absent/NA</u>		Are all temperatures within project specific guidelines? <u>Yes/No/NA</u>						
Ice Present: <u>Yes/No/NA</u>		VOA Headspace Present? <u>Yes/No/NA</u>						
pH Check Performed:	Metals	Yes/No/NA	Total Phenolics	Yes/No/NA	NO3/NO2	Yes/No/NA		
	Cyanide	Yes/No/NA	TPH - 418.1	Yes/No/NA	Oil & Grease	Yes/No/NA		
	Sulfide	Yes/No/NA	COD	Yes/No/NA	Total Phosphorous	Yes/No/NA		
	Ammonia	Yes/No/NA	TKN	Yes/No/NA	Gross A.B, Gamma Spec	Yes/No/NA		
Cooler Received	Cooler Condition	Temp.	Cooler Received	Cooler Condition	Temp.	Cooler Received	Cooler Condition	Temp.
	<u>good</u>	<u>2</u> °C	<u>4</u>		°C	<u>7</u>		°C
		°C	<u>5</u>		°C	<u>8</u>		°C
		°C	<u>6</u>		°C	<u>9</u>		°C
Taken By: <u>[Signature]</u>		Signature		Printed Name: <u>Meredith Edmunds</u>		Date: <u>12/17/19</u>		Date

CLIENT-RELATED INFORMATION

<input type="checkbox"/> Missing Cooler	<input type="checkbox"/> Missing Samples/Bottles	<input type="checkbox"/> Incorrect Preservation	<input type="checkbox"/> Insufficient Sample Volume
<input type="checkbox"/> Cooler Conditions	<input type="checkbox"/> Broken/Leaking Samples	<input type="checkbox"/> pH Criteria Not Met	<input type="checkbox"/> Chain of Custody Problems
<input type="checkbox"/> Missing Paperwork	<input type="checkbox"/> Incorrect Bottle Type	<input type="checkbox"/> Residual Chlorine Present	<input type="checkbox"/> Other:
<input type="checkbox"/> Missing/Incorrect Bottle Labels	<input type="checkbox"/> Cooler Temperatures Out of Range	<input type="checkbox"/> Head Space in Bottles	

BRIEFLY DESCRIBE THE PROBLEM AND THE ACTION TAKEN:

Client Notified? YES NO

Response Required Within 24 Hours

PROJECT MANAGEMENT

PROJECT MANAGER COMMENTS:

ALS Project Manager: _____ Returned to Sample Receipt by: _____ Date: _____

Printed Name Signature

Must Deliver Next Business Day
Time and Tempature Sensitive!



ORIGIN ID:SGRA (281) 530-5656
CLIENT SERVICES
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON, TX 77099
UNITED STATES US

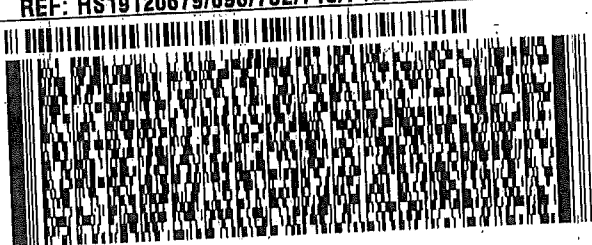
SHIP DATE: 16DEC19
ACTWGT: 47.30 LB
CAD: 300190/CAFE3211
DIMS: 26x14x14 IN
BILL THIRD PARTY

TO **SAMPLE RECEIVING
ALS ENVIRONMENTAL
960 W. LEVOY DRIVE**

SALT LAKE CITY UT 84123

(801) 286-7700

REF: HS19120679/696/702/715/745/765/843/844-



**FedEx
Express**

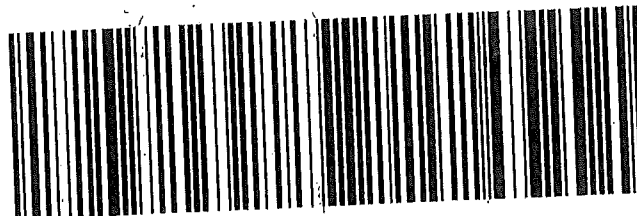


**TUE - 17 DEC 3:00P
STANDARD OVERNIGHT**

TRK# 1251 0292 9451
0201

AX BTFA

**84123
UT-US SLC**



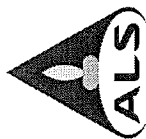


ALS Environmental CHAIN-OF-CUSTODY

Project / Job / Task: HS19120696		Split:		Workorder ID: 1935354		Level: ENV_LVL4	
Client: ALS Environmental (Houston)		Account: 8101		Type: 125Poly		Requested Analysis	
Comments:							
Item	Collect Date/Time	Sample ID	Lab ID	QC	Matrix	ID(s)	Count
1	12/11/2019 07:55	18WM24_121119	1935354001		Water	A	1
2	12/11/2019 08:50	18CPTMW15_121119	1935354002		Water	A	1
3	12/11/2019 09:45	AWD4_121119	1935354003		Water	A	1
4	12/11/2019 10:35	18WM08_121119	1935354004		Water	A	1
5	12/11/2019 11:25	18CPTMW19_121119	1935354005		Water	A	1
6	12/11/2019 12:15	18CPTMW18_121119	1935354006		Water	A	1
7	12/11/2019 13:10	C03_121119	1935354007		Water	A	1
8							
9							
10							

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ORIGINAL FIELD SAMPLE CHAIN-OF-CUSTODY				SAMPLE PREPARATION / ANALYSIS CHAIN-OF-CUSTODY			
Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location	Sample Prep / Analysis for:	Lab Notebook No.:	Prepared / Analyzed by:	Date / Time:
<i>Julie</i>	12/17/2019 09:06	ALS Sample Receiving	Sample Login				
<i>R-33.1</i>	12/30/19 10:50	T. Bond	Storage				
			CLOF analysis				



Batch Worklist

HBN: 254594

Instrument:

Created: 12/31/2019 07:37

Batch: ELMS/ 2334



Status: WP

Analyst: T. Bosch

Rule: EPA 6850, DoD QSM Water

Workorder: 1935354 [ENV_LVL4]

Pos	Lab ID	Sample ID	Prep Initial	Prep Final	Dust Weight	Type	Mx	Container	Procedure	Mgr	Expire Date	Due Date	Run Date
1	690521	CCV for HBN 254594 [ELMS/2334]				CCV	3		E685041C3Q	5311		12/31/2019	12/31/2019
2	690522	LCS for HBN 254594 [ELMS/2334]				LCS	3		E6850Q413Q	5311		12/31/2019	12/31/2019
3	690523	RLVS for HBN 254594 [ELMS/2334]				RLVS	3		E685041C3Q	5311		12/31/2019	12/31/2019
4	690524	ICS for HBN 254594 [ELMS/2334]				ICS	3		E6850.D3Q	5311		12/31/2019	12/31/2019
5	690525	LMB for HBN 254594 [ELMS/2334]				LMB	3		E6850Q413Q	5311		12/31/2019	12/31/2019
6	1935354001	18WW24_121119				SAMPLE	3	1935354001-A	E6850Q41.3	5480	1/8/2020	12/31/2019	12/31/2019
7	690526	18WW24_121119(193535400 IMS)				MS	3		E6850Q413Q	5311		12/31/2019	12/31/2019
8	690527	18WW24_121119(193535400 IMSD)				MSD	3		E6850Q413Q	5311		12/31/2019	12/31/2019
9	1935354002	18CpTMW15_121119				SAMPLE	3	1935354002-A	E6850Q41.3	5480	1/8/2020	12/31/2019	12/31/2019
10	1935354003	AWD4_121119				SAMPLE	3	1935354003-A	E6850Q41.3	5480	1/8/2020	12/31/2019	12/31/2019
11	1935354004	18WW08_121119				SAMPLE	3	1935354004-A	E6850Q41.3	5480	1/8/2020	12/31/2019	12/31/2019
12	1935354005	18CpTMW19_121119				SAMPLE	3	1935354005-A	E6850Q41.3	5480	1/8/2020	12/31/2019	12/31/2019
13	1935354006	18CpTMW18_121119				SAMPLE	3	1935354006-A	E6850Q41.3	5480	1/8/2020	12/31/2019	12/31/2019
14	1935354007	C03_121119				SAMPLE	3	1935354007-A	E6850Q41.3	5480	1/8/2020	12/31/2019	12/31/2019
15	690528	CCV for HBN 254594 [ELMS/2334]				CCV	3		E685041C3Q	5311		12/31/2019	12/31/2019

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ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Analytical Documentation

Analyst Write-upALS Work Order #'s & Sample #()'s: 1935354 (001-07)ELMS Batch/HBN ID: 2334 (254594)Prep Date: 12/30/2019 Analysis Date: 12/31/2019 Analyst: Tom BoschAnalyte: **Perchlorate** Matrix: **Water** Method: **6850**Sequence: \\HPCHEM\1\SEQUENCE\CLO4\2019\DEC\31DEC19D.sReported DL: **1.0µg/L** Reported LOD: **2.0µg/L** Reported LOQ: **4.0µg/L**SAMPLE PREPARATION/ANALYSIS:

Water: Samples were prepared by Tom Bosch. 10.0mL of each sample was pipetted into a 15-mL centrifuge tube, and 50µL of an oxygen-18 labeled perchlorate solution was added as an internal standard. The samples were capped, vortexed, and filtered with Phenex PES membrane 0.45µm Syringe filters prior to analysis.

REAGENTS: Eluent A1: 95% ASTM Type II water (ALS)/5%ACN (B&J Lot DU461-US)/0.1% glacial acetic acid (JT-Baker Lot 122550).
Eluent B1: 95% ACN (B&J Lot DU461-US)/5% ASTM Type II water (ALS)/0.1% glacial acetic acid (JT-Baker Lot 122550).

STANDARDS: Internal Standard Spiking Solution Horizon# 47863. Dilutions of Working Standards (Horizon: 49947/48) used for ICAL, CCV's, RLVS and ICS.

CALIBRATION CURVE: Used curve from 09/20/2019, sequence 20SEP19D.s Offline Quantitation Method: CLO4-DP3.M

INSTRUMENT CONDITIONS: Samples were analyzed with an Agilent 1100 LC/MSD system, in negative SIM mode, monitoring m/z 83, 85, and 89.

Instrument ID: LCMS04 Online Acquisition Method: CLO4-AQN.M Fragmentor: 160 Output Gain: 8 Injection Volume: 35µL
Column: KP-RPPX C8 separator, 250mm Mobile Phase: 70% Eluent A1; 30% Eluent B1 Run time: 12.0min.

FLOW GRADIENT:

Time (min.)	Flow (mL/min)
0	0.65
5.8	0.65
5.9	0.25
10.3	0.25
10.5	0.65
12.0	0.65

QC DATA: 3.0µL of QC Solution Horizon ID 47516 was used for LCS 690522; Target = 3.0µg/L. ASTM type II water was used for LMB 690525.

MS/MSD: The Matrix Spike and duplicate (MS/MSD) was performed on sample 1935354001 (Client ID's: 18WW24_121119). 3.0µL of Working Standard Solution Horizon ID 49947 was added to 10.0mL of sample preparation. Spike target = 3.0µg/L.

COMMENTS:

- 1) Results reported in µg/L. Sample 1935354006 failed the 50-150% method requirement for ISTD recovery. This sample was re-prepped, re-analyzed and reported. Field samples 1935354003/04 were analyzed and reported from 1:100 dilutions. The reporting limits have been adjusted accordingly.
- 2) All QC, Blank, CCV, and MS/MSD results were within method parameters.
- 3) Sample data can be viewed at two directories within the ALS system: \\ALSLTWS013\LCMS\LCMS04\2019\DEC\HBN# or through NuGenesis\Tree\PrintData\LCMS\DefaultView.
- 4) Notebook: \\alsltws013\ORGANIC\BOSCH\LCMS\Perchlorates\Waters\2019\254594-DoD-ALS-Hstn LCMS4 or through \\ALSLTWS013\DATA\REVIEW\HBN#
- 5) The Reporting Limit Verification Standard (RLVS – 690523) is reported from the analysis of the Laboratory Control Sample (LCS – 690522) at a level of 3.0µg/L.
- 6) Due to limitations of the Chemstation Software, some of the chromatographic peaks require manual integration. Manual Integrations were performed for one of the Initial Calibration analyses (datafile: 20SEPI03).

5.5 Chromatography (GC, HPLC and LC/MS) Technical Review

Note: It is the peer reviewer's responsibility to ensure that appropriate criteria are used as defined in the HORIZON PROFILE. The evaluation criteria are prioritized as per Section 2.2 of this SOP. These items must be checked for all projects. The following checklist will be completed by both the analyst and the peer reviewer and scanned into the HBN folder with the raw data.

Chromatography (GC, HPLC, LC/MS) Technical Review Criteria	Analyst Initials	Reviewer Initials
Batch(es)/SDG: <u>ELMS: 2334 HBN: 254594</u>		
Sample Set IDs if Applicable: <u>1935354</u>		
Sample positions on autosampler verified against instrument sequence	TB	NA
Calibration standards analyzed and meets criteria	TB	SB
Standards traceability checked and meets criteria	TB	SB
Standard curve coefficients evaluated and meet criteria	TB	SB
ICVs analyzed and meet acceptance criteria	TB	SB
CCVs analyzed and meet acceptance criteria	TB	SB
Retention Time Windows checked	TB	SB
For method 8081A, Endrin/DDT Breakdown is checked for compliance	—	—
Surrogate recoveries checked and appropriately addressed	—	—
Method Preparation Blanks analyzed and meet acceptance criteria	TB	SB
MSs, MSDs, and/or MDs analyzed and calculations checked; applicable	TB	SB
RLVS analyzed	TB	SB
Preparation and analysis hold times met	TB	SB
Preparation deviations and re-preparations noted when performed	TB	SB
Analysis deviations and re-analyses noted when performed	TB	SB
Sample dilution factors noted on reports	TB	SB
Electronic records in HBN transcription accuracy and completeness	TB	SB
Preparation and analysis calculations checked	TB	SB
NCRs are completed as necessary NC/CAR# _____	TB	SB
Report forms are complete and accurate	TB	SB
Manual integrations checked	TB	SB



STANDARD REPORT

Working Standard - CLO4ISTDWRK

CLO4ISTDWRK		Description - Perchlorate ISTD Wrk 1,000ug/L			
Standard: 49946		Created By: Thomas Bosch		Amount: 25 mL	
MFG: ALS/SLC		Create Date: 09/23/2019 03:09PM		Expires: 09/19/2020	
MFG Lot: TNB: 09/20/2019		Verified By: Thomas Bosch		Usable: Yes	
Pipette ID: Not Provided		Verify Date:		Lab Lot: CLO4ISTDWRK	
Pos.	Analyte	Name	Concentration		
1	14797-73-0-8385	Perchlorate 83:85 Ratio	1000 ug/L		
2	14797-73-0-89	Perchlorate 89	1000 ug/L		
Composition					
Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
47863	CLO4ISTDSTK	Perchlorate ISTD Stock	CLO4ISTDSTK	0.25 mL	12/05/2028



STANDARD REPORT

Constituent

Stock Standard - CLO4ISTDSTK

CLO4ISTDSTK		Description - Perchlorate ISTD Stock	
Standard: 47863	Created By: Thomas Bosch	Amount: 1 mL	
MFG: Cambridge Isotope	Create Date: 05/23/2019 10:05AM	Expires: 12/05/2028	
MFG Lot: SDIH-016	Verified By: Thomas Bosch	Usable: Yes	
Part ID: OLM-7310-S	Verify Date:	Lab Lot: CLO4ISTDSTK	
Pos.	Analyte	Name	Concentration
1	14797-73-0-8385	Perchlorate 83:85 Ratio	100 ug/mL
2	14797-73-0-89	Perchlorate 89	100 ug/mL



STANDARD REPORT

Working Standard - CLO4 WRK

CLO4 WRK		Description - 6850 WKG Std 100.ug/L			
Standard: 49948		Created By: Thomas Bosch		Amount: 10 mL	
MFG: ALS/SLC		Create Date: 09/20/2019 03:09PM		Expires: 07/25/2020	
MFG Lot: TNB: 09/20/2019				Usable: Yes	
Pipette ID: Not Provided				Lab Lot: CLO4 WRK	
Pos.	Analyte	Name	Concentration		
1	14797-73-0	Perchlorate	0.1 ug/mL		
2	14797-73-0-8385	Perchlorate 83:85 Ratio	0.1 ug/mL		
Composition					
Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
49947	CLO4 INT	6850 Intermdt AccStd 10.ug/mL	CLO4 INT	0.1 mL	07/25/2020



STANDARD REPORT

Constituent

Stock Standard - CLO4 STOCK

CLO4 STOCK		Description - 6850 Stock AccStd 1,000ug/mL	
Standard: 43659		Created By: Thomas Bosch	
MFG: AccuStandard		Create Date: 09/17/2018 09:09AM	
MFG Lot: 218065075		Amount: 100 mL	
Part ID: IC-PER-10X-1		Expires: 07/25/2020	
		Usable: Yes	
		Lab Lot: CLO4 STOCK	
Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	1000 ug/mL
2	14797-73-0-8385	Perchlorate 83:85 Ratio	1000 ug/mL



STANDARD REPORT

Constituent

Solvent Standard - ASTM H2O

ASTM H2O		Description - ASTM Type II Water	
Standard: 109	Created By: ALS Support (Lims)	Amount: 1000 L	
MFG: DCL In House	Create Date: 10/06/2005 09:10AM	Expires: 11/07/2025	
MFG Lot: Not Provided		Usable: Yes	
Part ID: Not Provided		Lab Lot: LAB 109	
Pos.	Analyte	Name	Concentration
Solvent - Analyte(s) not applicable			



STANDARD REPORT

Constituent

Working Standard - CLO4 INT

CLO4 INT		Description - 6850 Intermdt AccStd 10.ug/mL			
Standard: 49947		Created By: Thomas Bosch		Amount: 10 mL	
MFG: ALS/SLC		Create Date: 09/23/2019 03:09PM		Expires: 07/25/2020	
MFG Lot: TNB: 09/20/2019				Usable: Yes	
Pipette ID: Not Provided				Lab Lot: CLO4 INT	
Pos.	Analyte	Name	Concentration		
1	14797-73-0	Perchlorate	10 ug/mL		
2	14797-73-0-8385	Perchlorate 83:85 Ratio	10 ug/mL		
Composition					
Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
43659	CLO4 STOCK	6850 Stock AccStd 1,000ug/mL	CLO4 STOCK	0.1 mL	07/25/2020



STANDARD REPORT

Working Standard - CLO4 QC WRK

CLO4 QC WRK		Description - 6850 QC WKG STD 100ug/L			
Standard: 47516		Created By: Thomas Bosch		Amount: 10 mL	
MFG: ALS/SLC		Create Date: 05/06/2019 03:05PM		Expires: 03/31/2020	
MFG Lot: TNB: 05/06/2019				Usable: Yes	
Pipette ID: Not Provided		Lab Lot: CLO4 QC WRK 100.ug/L			
Pos.	Analyte	Name			Concentration
1	14797-73-0	Perchlorate			100 ug/L
Composition					
Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
47515	CLO4 QC INT	6850 QC Intrmdt Std-QC 10ug/mL	CLO4 QC INT 10.ug/mL	0.1 mL	03/31/2020



STANDARD REPORT

Constituent

Solvent Standard - ASTM H2O

ASTM H2O		Description - ASTM Type II Water	
Standard: 109	Created By: ALS Support (Lims)	Amount: 1000 L	
MFG: DCL In House	Create Date: 10/06/2005 09:10AM	Expires: 11/07/2025	
MFG Lot: Not Provided		Usable: Yes	
Part ID: Not Provided		Lab Lot: LAB 109	
Pos.	Analyte	Name	Concentration
Solvent - Analyte(s) not applicable			



STANDARD REPORT

Constituent

Stock Standard - CLO4 QCSTOCK

CLO4 QCSTOCK		Description - 6850 QC Stock STD 1,000ug/mL	
Standard: 36748	Created By: Thomas Bosch	Amount: 100 mL	
MFG: Ultra Scientific	Create Date: 05/11/2017 01:05PM	Expires: 03/31/2020	
MFG Lot: CP-0860		Usable: Yes	
Part ID: ICC-013		Lab Lot: CLO4 QC STOCK	
Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	1000 ug/mL



STANDARD REPORT

Constituent

Working Standard - CLO4 QC INT

CLO4 QC INT		Description - 6850 QC Intrmdt Std-QC 10ug/mL			
Standard: 47515		Created By: Thomas Bosch		Amount: 10 mL	
MFG: ALS/SLC		Create Date: 05/06/2019 03:05PM		Expires: 03/31/2020	
MFG Lot: TNB: 05/06/2019				Usable: Yes	
Pipette ID: Not Provided		Lab Lot: CLO4 QC INT 10.ug/mL			
Pos.	Analyte	Name			Concentration
1	14797-73-0	Perchlorate			10 ug/mL
Composition					
Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
36748	CLO4 QCSTOCK	6850 QC Stock STD 1,000ug/mL	CLO4 QC STOCK	0.1 mL	03/31/2020

125 Market Street
New Haven, CT 06513
USA



Tel (203)786-5290
Fax (203)786-5287
www.AccuStandard.com

CERTIFICATE OF ANALYSIS



AccuTrace™ Reference Standard

Catalog No: IC-PER-10X-1
Description: Perchlorate Standard
Element: Perchlorate (ClO₄)
SRM: Ind. Std.
Lot: 218065075
Matrix: Water
Hazards: Refer to SDS for complete safety information

Date Certified: Jun 25, 2018
Expiration: Jul 25, 2020
Sample Size: 100 mL
Components: 1
Storage Condition: Ambient (>5 °C)
Included on ISO/IEC 17025 Scope of Accreditation: Yes
Included on ISO 17034 Scope of Accreditation: Yes



Signal Word: None

Component	SRM #	Prepared Concentration (µg/mL)
ClO ₄ Perchlorate	Ind. Std.	1000

The gravimetric uncertainty for this product is ±0.24%.

The final solution was checked against an independent standard to verify its concentration.

We use the highest purity raw materials available to minimize impurity levels in the final solution. Typically 99.999%+ pure starting materials are used as well as ASTM Type I 18 megohm deionized water.

All solutions are filtered through a 0.2 µm filter prior to being bottled.

All glassware used in preparation is Class A and calibrated regularly.

All weights are traceable through NIST, Test No. 822-275872-11

All bottles are triple rinsed with deionized water prior to use.

Shake bottle prior to use and do not pipette directly out of the bottle. Use only cleaned Class A volumetric glassware.

We certify the accuracy of this standard to be ±0.5% of the stated value until its expiration date provided it is kept tightly capped and stored under the conditions stated above.

Certified By: Meigan O'Leary
Meigan O'Leary, Inorganic QC Manager

Page 1 of 1

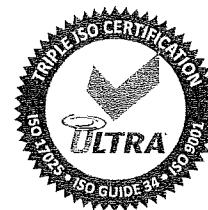
For use in routine laboratory analysis.

AccuStandard is accredited to ISO 17034, ISO/IEC 17025 and certified to ISO 9001:2015

QR-ORG/NO-001
Rev. 5/18



Certificate of Analysis



ISO Guide 34 Reference Material

Product Number: ICC-013

Lot Number: CP-0860

S



Lot Issue Date: 29-Feb 2016

Expiration Date: 31-Mar 2020

Product Name: Perchlorate IC Standard

Description:

This Reference Material (RM) was gravimetrically prepared in accordance with ISO Guide 34 and under ULTRA Scientific's ISO 9001 registered quality system. The neat materials used for this product have been verified by ULTRA's ISO 17025 laboratory and under ULTRA's ISO Guide 34 accreditation. The analyte concentrations were verified by ULTRA's ISO 17025 accredited laboratory. For each analyte, the true value, with its uncertainty value calculated at the 95% confidence level, is reported below.

Analyte	Starting Material	Lot Number	Purity (%)	Calculated Value	True Value	Traceability & Method
perchlorate	potassium perchlorate	RM07987	100	1001 ± 5 µg/mL	976 ± 6 µg/mL	NIST SRM 3141A; ICP-OES

Solvent: water (low TOC, < 50 ppb)

Storage: Store at Room Temperature (15° to 30°C).

Traceability:

Traceability has been established through an unbroken chain of comparisons, each having stated uncertainties. Comparisons are based on appropriate physical or chemical measurements, including gravimetric or volumetric dilution, where the mass or volume of a solution before and after dilution is measured. The balances used for these measurements are calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1, ISO 9001, ISO 17025, and ISO Guide 34. Calibrated Class A glassware is used for volumetric measurements. Thermometers are calibrated against a NIST traceable thermometer in accordance with NIST Special Publication 819.

Estimation of Uncertainties:

The true value is reported, with its uncertainty value calculated at the 95% confidence level.

Homogeneity:

This RM was formulated and unitized according to an in-house procedure and is guaranteed to be homogeneous. There is no minimum sub-sample size required.

Intended Use:

This RM is intended for the preparation of working reference samples for use in routine laboratory analyses, calibration of instruments, validation of analytical methods, assessments of measurement methods and continuing calibration verification.

Instructions for Use:

Sample aliquots for analysis should be withdrawn at 20°C to 25°C immediately after opening and should be processed without delay for the true value to be valid within the stated uncertainties. Do not pipet from the bottle. Do not return any material removed for pipetting to the bottle. Tightly cap the bottle after removing any material and store according to the instructions noted above.

Hazards:

Refer to the Safety Data Sheet for information regarding this RM.

Expiration of Certification:

The certification of this RM is valid, within the measurement uncertainty specified, until the expiration date specified above, provided the RM is handled and stored in accordance with the instructions given in this certificate. This certification is nullified if the RM is damaged, contaminated, or otherwise modified.



ISO 9001 Registered Quality System – TUV USA

Page 1 of 2



Certificate of Analysis

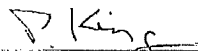


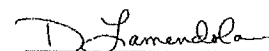
ISO Guide 34 Reference Material

Product Number: ICC-013 Lot Issue Date: 29-Feb 2016
 Lot Number: CP-0860 Expiration Date: 31-Mar 2020

Maintenance of Certification:

The real-time, long term stability of the RM may be monitored over the lifetime of the certification. If substantive changes occur that affect the certification before the expiration of this certificate, ULTRA Scientific will notify the purchaser.


 Peter A. King, Ph.D.
 VP, Technical Operations


 Daniel J. Lamendola
 Director of QA/RA



ISO 9001 Registered Quality System – TUV USA

Page 2 of 2



Cambridge Isotope Laboratories, Inc.

Certificate of Analysis

S



Product Name: PERCHLORIC ACID, SODIUM SALT
(Isotopic Label & Enrichment Specification) (18O4, 90%+) 100 UG/ML IN WATER

Lot Number: SDIH-016

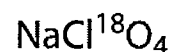
Catalog Number: OLM-7310-S

Product Information

Chemical Purity Specification: $\geq 98\%$

MW*: 130.44
* For isotopically labeled compounds, MW listed is for the fully enriched product.

Labeled CAS Number: NA



Unlabeled CAS Number: 7601-89-0

Chemical Formula: NaCl*O4

Storage: Store at room temperature away from light and moisture.

Stability: See storage and expiration date.

Certification

Cambridge Isotope Laboratories, Inc. guarantees that this material meets or exceeds the specifications stated. Absolute identity as well as chemical and isotopic purities are assured by the use of unambiguous synthetic routes and multiple chemical analyses whenever possible. Results are representative of QC testing at time of release from Quality Control unless otherwise stated. CIL Certificates of Analysis are occasionally updated with new data following recertification. We recommend checking the website for the latest version.

Volumetric measurements were made with Class A glassware. Gravimetry is traceable to the NIST through calibrated balances and certified, calibrated, standard weights. The calibrations are traceable to the NIST under Test No. 822/270236-04. The calibrations also meet specifications outlined in ISO 9001, ISO/IEC 17025, ANSI/NSCL Z540-1-1994, NCR Document 10CFR50 Appendix B, and applicable subdocuments.

This COA references the bulk catalog number before packaging. The COA also applies to the CIL finished good catalog number. Some possible packaging sizes and their corresponding suffix are -1.2, -1, -0.5, -10, or -0.1.

Approved by: Sashi Sivendran-Basak

Sashi Sivendran-Basak, Ph.D., Quality Review

Quality Control Tests and Results

QC Release Date	12/05/2018
Expiration Date	12/05/2028
Concentration Based on Gravimetry	100.0 \pm 1.0 $\mu\text{g/mL}$ (k=2)
Chemical Purity of Neat Material(s)	98%
LC/MS for Concentration	105.4 \pm 1.1 $\mu\text{g/mL}$ (k=2)

CIL subscribes to the following standards for different products: ISO Guide 34, ISO/IEC 17025, ISO 13485 and cGMP as appropriate.



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Batch Review Method:

C:\HPCHEM\1\METHODS\CLO4-DP3.M

['#' ==> Run has not been reprocessed with Batch Review Method

['*' ==> Run has been saved with batch file]

#*	Sample	Location	Inj	SampleType	Run	Perchlorate Area	Perchlorat RT	Perchlorate Amount	
*	690521	CCV@25	Vial 71	1	Control	1	2.07050e6	7.400	26.87838
*	690522	QC@3.0	Vial 72	1	Control	2	1.98208e5	7.353	3.30245
*	690524	ICS@3.0	Vial 73	1	Control	3	1.50085e5	7.361	3.19643
*	690525	LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
*	1935354001		Vial 75	1	Sample	5	0.00000	0.000	0.00000
*	690526	353541S	Vial 76	1	Sample	6	1.73912e5	7.121	3.13298
*	690527	353541D	Vial 77	1	Sample	7	1.75321e5	6.973	3.17559
*	1935354002		Vial 78	1	Sample	8	1.13655e5	7.178	2.50330
*	1935354003	100	Vial 79	1	Sample	9	2.20204e5	7.558	409.62609
*	1935354005		Vial 81	1	Sample	11	1.79890e6	7.447	27.28948
*	1935354006		Vial 82	1	Sample	12	0.00000	0.000	0.00000
*	1935354007		Vial 83	1	Sample	13	8.25670e5	7.258	14.88229
*	1935354004	100	Vial 84	1	Sample	14	1.99181e6	7.577	3240.22356
*	1935354006	RE	Vial 85	1	Sample	15	0.00000	0.000	0.00000
*	690528	CCV@25	Vial 71	1	Control	16	1.75978e6	7.397	26.60159

#*	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount	
*	690521	CCV@25	Vial 71	1	Control	1	2.61185e5	7.417	5.00000
*	690522	QC@3.0	Vial 72	1	Control	2	2.21074e5	7.370	5.00000
*	690524	ICS@3.0	Vial 73	1	Control	3	1.72895e5	7.377	5.00000
*	690525	LMB	Vial 74	1	Control	4	2.18551e5	7.315	5.00000
*	1935354001		Vial 75	1	Sample	5	1.85618e5	7.088	5.00000
*	690526	353541S	Vial 76	1	Sample	6	2.04356e5	7.140	5.00000
*	690527	353541D	Vial 77	1	Sample	7	2.03279e5	6.998	5.00000
*	1935354002		Vial 78	1	Sample	8	1.66542e5	7.200	5.00000
*	1935354003	100	Vial 79	1	Sample	9	1.98232e5	7.581	500.00000
*	1935354005		Vial 81	1	Sample	11	2.23128e5	7.469	5.00000
*	1935354006		Vial 82	1	Sample	12	1.20569e5	7.126	5.00000
*	1935354007		Vial 83	1	Sample	13	1.97653e5	7.279	5.00000
*	1935354004	100	Vial 84	1	Sample	14	2.03781e5	7.596	500.00000
*	1935354006	RE	Vial 85	1	Sample	15	1.70534e5	7.067	5.00000
*	690528	CCV@25	Vial 71	1	Control	16	2.24554e5	7.410	5.00000

#*	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount	
*	690521	CCV@25	Vial 71	1	Control	1	6.15908e5	7.411	26.29630
*	690522	QC@3.0	Vial 72	1	Control	2	6.62253e4	7.378	3.52884
*	690524	ICS@3.0	Vial 73	1	Control	3	5.15176e4	7.372	3.50953
*	690525	LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
*	1935354001		Vial 75	1	Sample	5	0.00000	0.000	0.00000
*	690526	353541S	Vial 76	1	Sample	6	5.42436e4	7.134	3.11375
*	690527	353541D	Vial 77	1	Sample	7	5.80829e4	6.992	3.36079
*	1935354002		Vial 78	1	Sample	8	4.10661e4	7.195	2.88375
*	1935354003	100	Vial 79	1	Sample	9	6.80048e4	7.577	405.57944
*	1935354005		Vial 81	1	Sample	11	5.42002e5	7.461	27.01516
*	1935354006		Vial 82	1	Sample	12	0.00000	0.000	0.00000
*	1935354007		Vial 83	1	Sample	13	2.69790e5	7.272	15.81641
*	1935354004	100	Vial 84	1	Sample	14	5.98267e5	7.593	3204.37347
*	1935354006	RE	Vial 85	1	Sample	15	0.00000	0.000	0.00000
*	690528	CCV@25	Vial 71	1	Control	16	5.23869e5	7.415	26.04022

*** End of Report ***

Sequence Table:

Method and Injection Info Part:

Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
====	=====	=====	=====	===	=====	=====	=====
1	Vial 71	690521	CCV@25	CLO4-AQN	1		Ctrl Samp
2	Vial 72	690522	QC@3.0	CLO4-AQN	1		Ctrl Samp
3	Vial 73	690524	ICS@3.0	CLO4-AQN	1		Ctrl Samp
4	Vial 74	690525	LMB	CLO4-AQN	1		Ctrl Samp
5	Vial 75	1935354001		CLO4-AQN	1		Sample
6	Vial 76	690526	353541S	CLO4-AQN	1		Sample
7	Vial 77	690527	353541D	CLO4-AQN	1		Sample
8	Vial 78	1935354002		CLO4-AQN	1		Sample
9	Vial 79	1935354003	100	CLO4-AQN	1		Sample
10	Vial 80	1935354004	1K	CLO4-AQN	1		Sample
11	Vial 81	1935354005		CLO4-AQN	1		Sample
12	Vial 82	1935354006		CLO4-AQN	1		Sample
13	Vial 83	1935354007		CLO4-AQN	1		Sample
14	Vial 84	1935354004	100	CLO4-AQN	1		Sample
15	Vial 85	1935354006	RE	CLO4-AQN	1		Sample
16	Vial 71	690528	CCV@25	CLO4-AQN	1		Ctrl Samp

Data file: C:\HPCHEM\1\DATA\31DEC19D\31DECD01.D

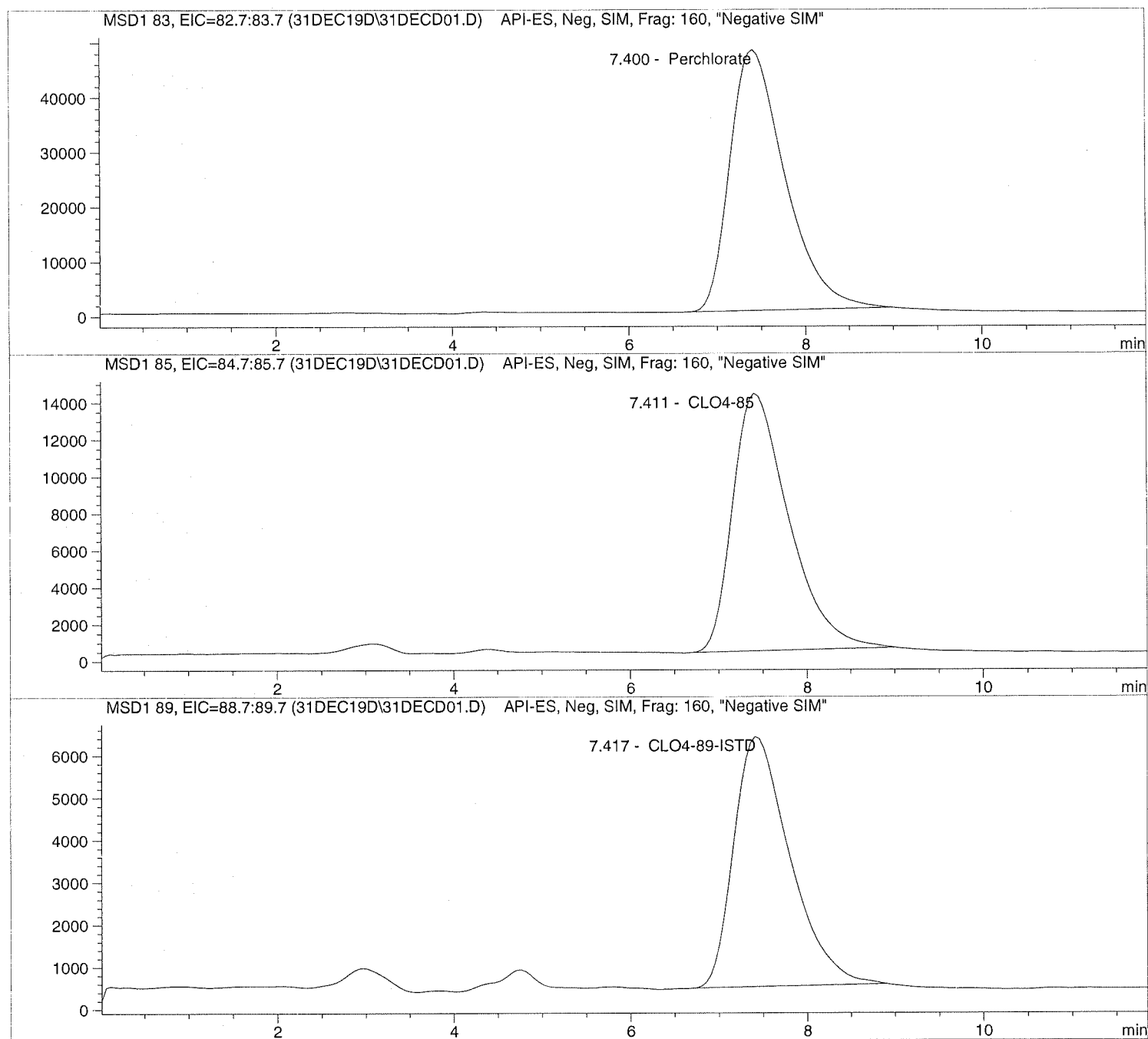
Sample Name: 690521 CCV@25

=====
Injection Date: 12/31/2019 08:14:46
Sample Name: 690521 CCV@25
Acq Operator: TNB

Seq Line: 1
Location: Vial 71
Inj. No.: 1
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\31DEC19D\31DECD01.D Sample Name: 690521 CCV@25

```

=====
Injection Date: 12/31/2019 08:14:46      Seq Line: 1
Sample Name: 690521 CCV@25              Location: Vial 71
Acq Operator: TNB                        Inj. No.: 1
                                           Inj. Vol.: 35 µl
=====

```

```

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By: Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 25.000
=====

```

```

=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.400	PBA	2070500.8	26.8784	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.411	PBA	615908.1	26.2963	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.417	PBA	261185.1	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

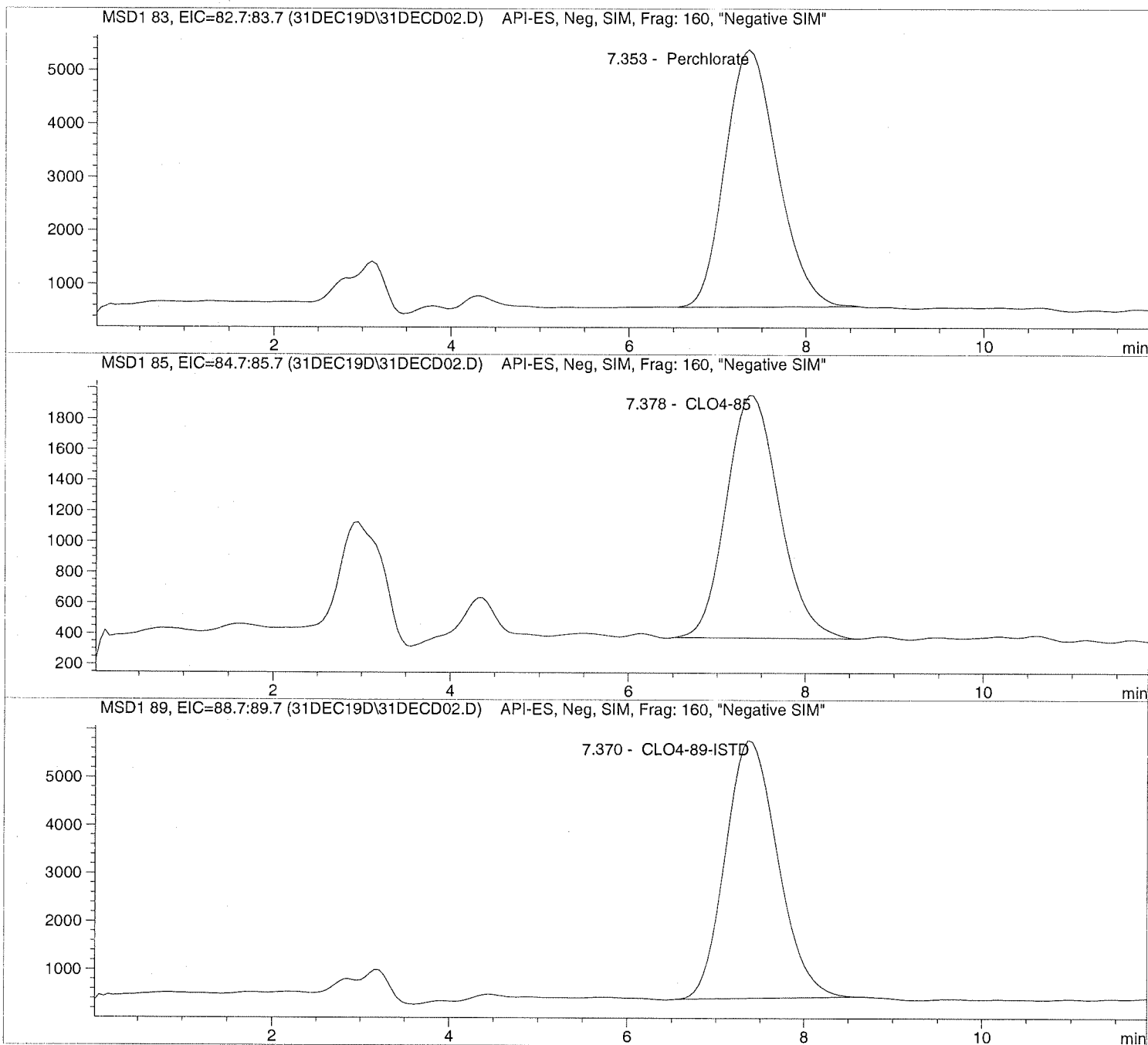
```


Data file: C:\HPCHEM\1\DATA\31DEC19D\31DECD02.D Sample Name: 690522 QC@3.0

```
=====
Injection Date: 12/31/2019 08:30:25      Seq Line:      2
Sample Name:    690522 QC@3.0            Location:      Vial 72
Acq Operator:   TNB                      Inj. No.:     1
                                           Inj. Vol.:    35 µl
=====
```

```
Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   11/5/2019 08:44:45
```

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\31DEC19D\31DEC02.D Sample Name: 690522 QC@3.0

```

=====
Injection Date: 12/31/2019 08:30:25      Seq Line: 2
Sample Name: 690522 QC@3.0              Location: Vial 72
Acq Operator: TNB                        Inj. No.: 1
                                           Inj. Vol.: 35 µl
=====

```

```

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By: Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 3.000
=====

```

```

=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.353	BBA	198208.1	3.3025	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.378	PBA	66225.3	3.5288	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.370	PBA	221074.4	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\31DEC19D\31DECD03.D

Sample Name: 690524 ICS@3.0

Injection Date: 12/31/2019 08:44:20

Seq Line: 3

Sample Name: 690524 ICS@3.0

Location: Vial 73

Acq Operator: TNB

Inj. No.: 1

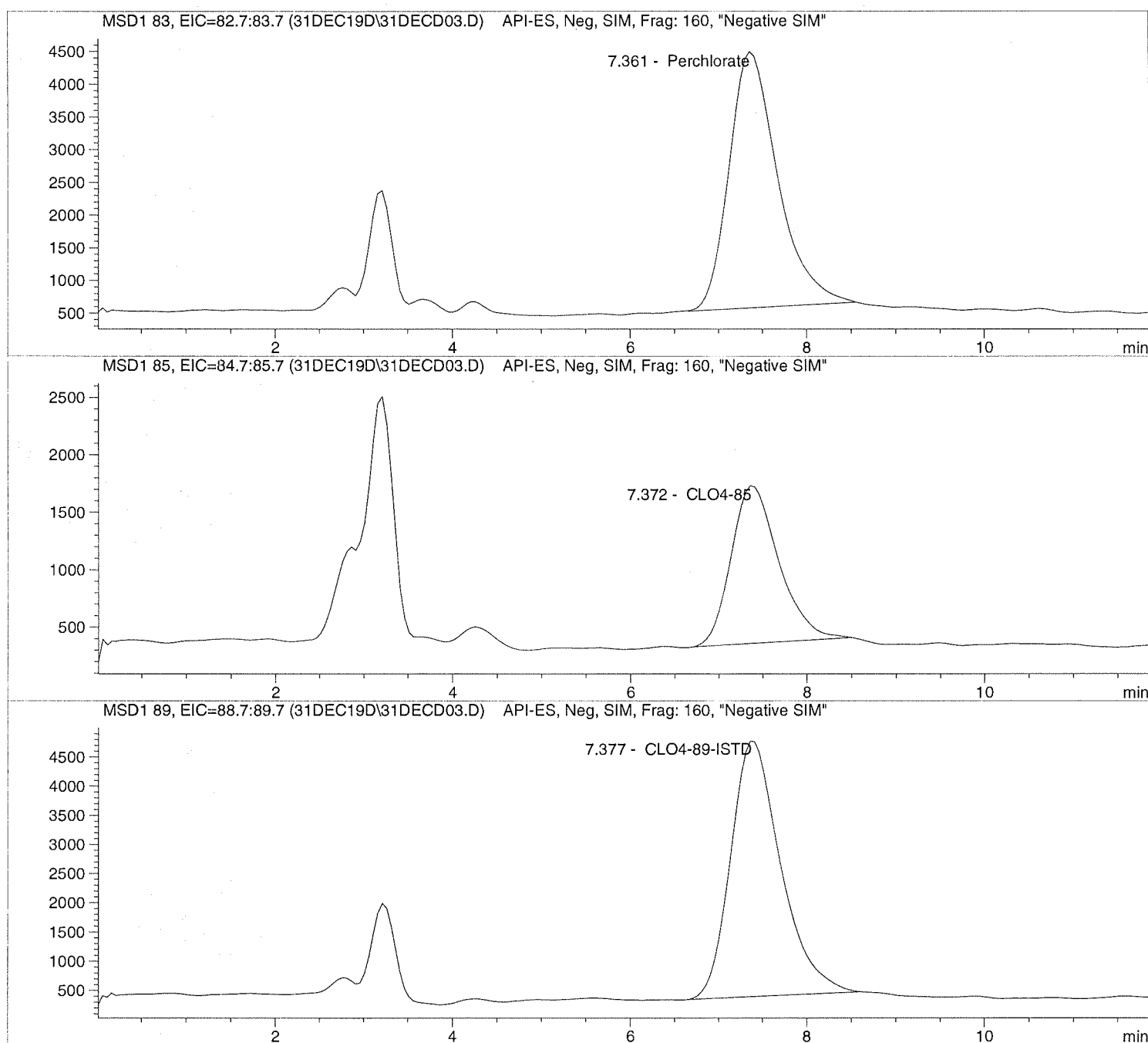
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M

Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\31DEC19D\31DECD03.D Sample Name: 690524 ICS@3.0

```

=====
Injection Date: 12/31/2019 08:44:20      Seq Line:          3
Sample Name:    690524 ICS@3.0           Location:          Vial 73
Acq Operator:   TNB                      Inj. No.:         1
                                           Inj. Vol.:        35 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  3.000
=====

```

```

=====
                          LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.361	BBA	150084.6	3.1964	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.372	PBA	51517.6	3.5095	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.377	PBA	172894.9	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

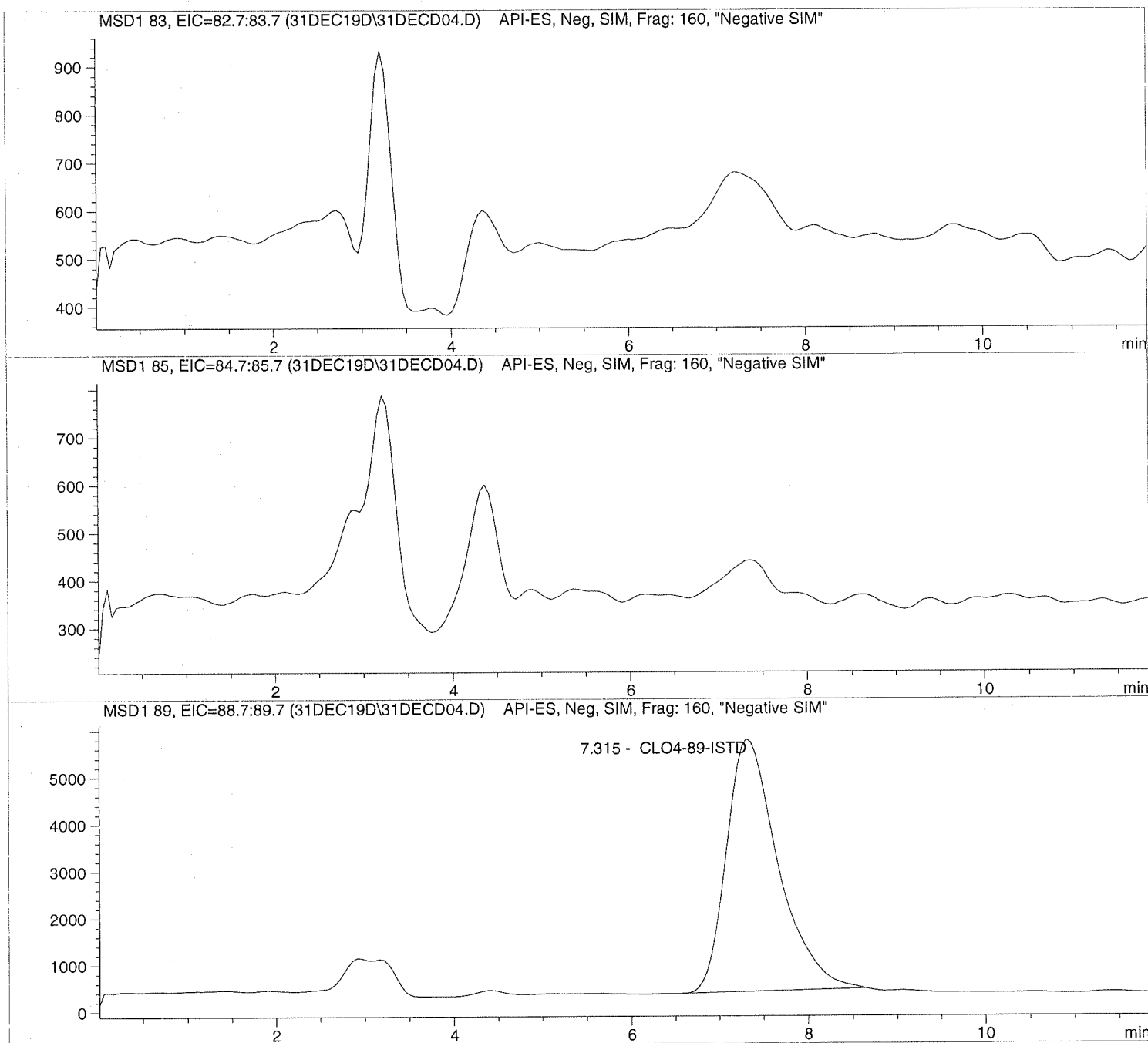
Data file: C:\HPCHEM\1\DATA\31DEC19D\31DECD04.D

Sample Name: 690525 LMB

=====
Injection Date: 12/31/2019 08:58:15
Sample Name: 690525 LMB
Acq Operator: TNB

Seq Line: 4
Location: Vial 74
Inj. No.: 1
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis
=====

Data file: C:\HPCHEM\1\DATA\31DEC19D\31DECD04.D

Sample Name: 690525 LMB

```

=====
Injection Date: 12/31/2019 08:58:15      Seq Line:          4
Sample Name:    690525 LMB                Location:          Vial 74
Acq Operator:   TNB                      Inj. No.:         1
                                           Inj. Vol.:        35 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  0.000
=====

```

```

=====
                          LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.315	PBA	218551.4	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\31DEC19D\31DECD05.D

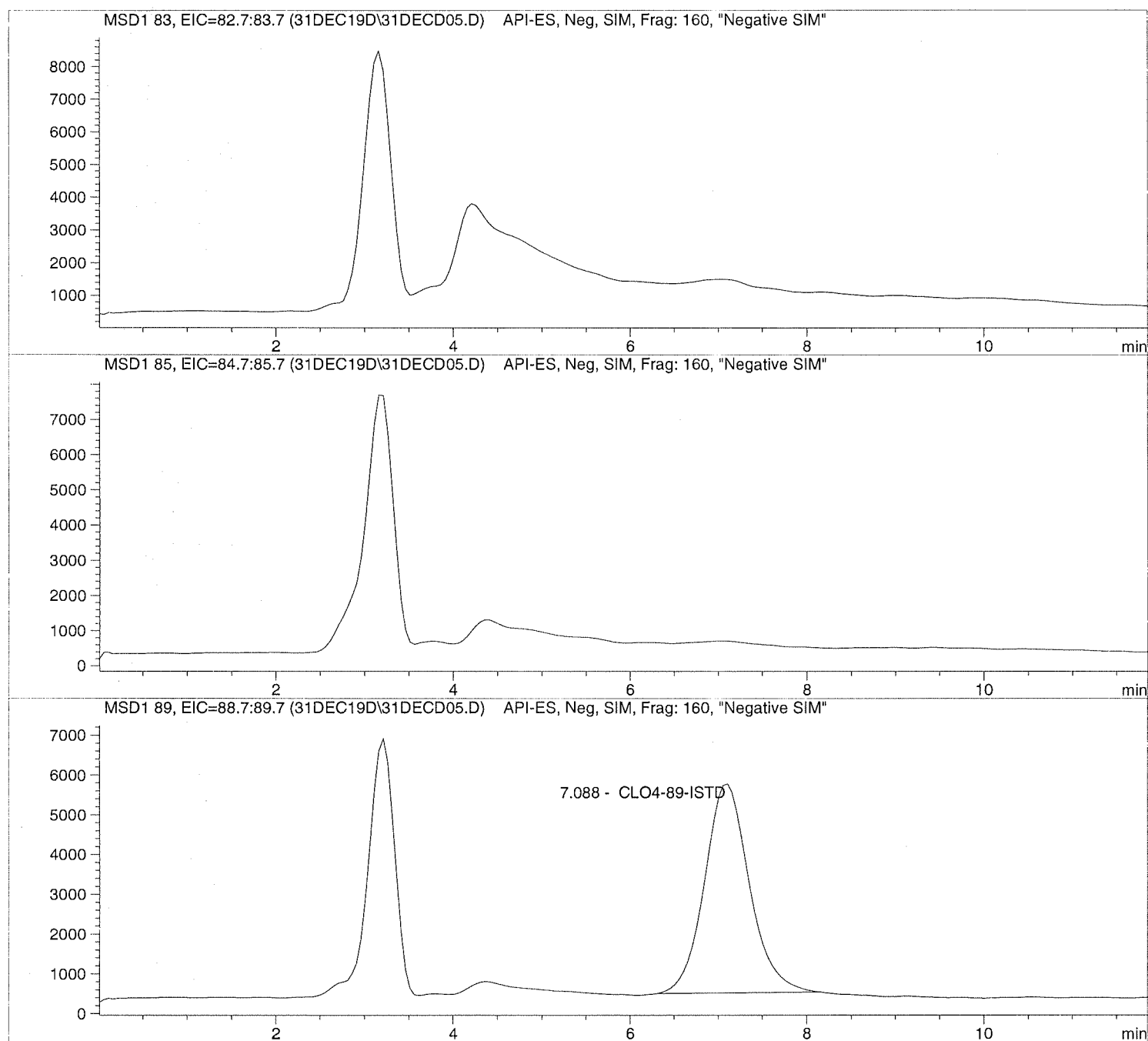
Sample Name: 1935354001

Injection Date: 12/31/2019 09:12:22
Sample Name: 1935354001
Acq Operator: TNB

Seq Line: 5
Location: Vial 75
Inj. No.: 1
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\31DEC19D\31DECD05.D Sample Name: 1935354001

```

=====
Injection Date: 12/31/2019 09:12:22      Seq Line:          5
Sample Name:    1935354001                Location:          Vial 75
Acq Operator:   TNB                       Inj. No.:         1
                                           Inj. Vol.:        35 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:   0.000
=====

```

```

=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.088	BBA	185617.6	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```


Data file: C:\HPCHEM\1\DATA\31DEC19D\31DECD06.D

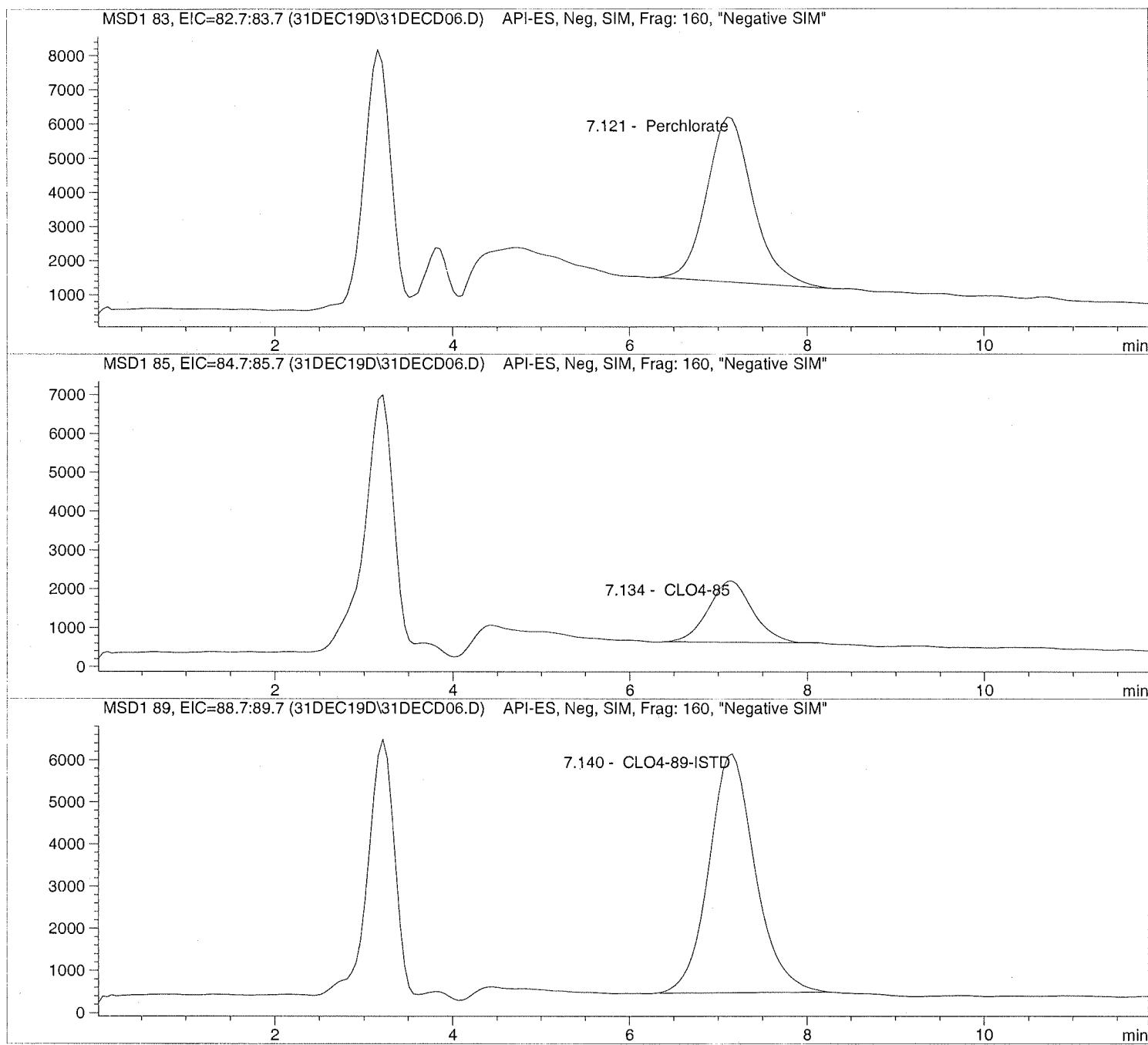
Sample Name: 690526 353541S

=====
Injection Date: 12/31/2019 09:26:16
Sample Name: 690526 353541S
Acq Operator: TNB

=====
Seq Line: 6
Location: Vial 76
Inj. No.: 1
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\31DEC19D\31DEC06.D Sample Name: 690526 353541S

```

=====
Injection Date: 12/31/2019 09:26:16      Seq Line:          6
Sample Name:   690526 353541S           Location:         Vial 76
Acq Operator:  TNB                      Inj. No.:        1
                                           Inj. Vol.:       35 µl
=====

```

```

Acq. Method:   CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:  11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  0.000
=====

```

```

=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.121	PBA	173912.4	3.1330	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.134	PBA	54243.6	3.1137	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.140	PBA	204356.3	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\31DEC19D\31DECD07.D

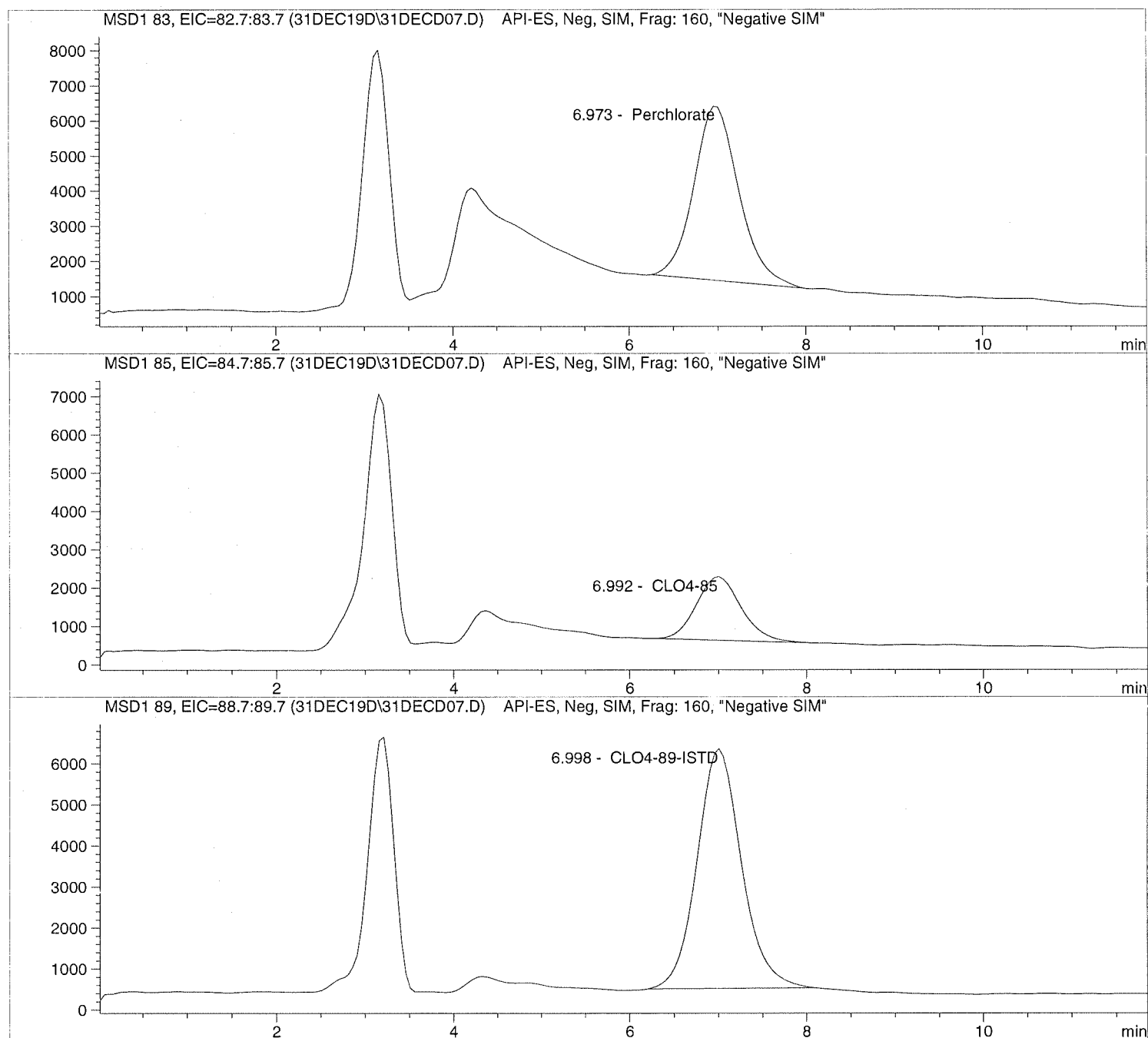
Sample Name: 690527 353541D

Injection Date: 12/31/2019 09:40:12
Sample Name: 690527 353541D
Acq Operator: TNB

Seq Line: 7
Location: Vial 77
Inj. No.: 1
Inj. Vol.: 35 μ l

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\31DEC19D\31DECD07.D Sample Name: 690527 353541D

```

=====
Injection Date: 12/31/2019 09:40:12      Seq Line:          7
Sample Name:   690527 353541D           Location:         Vial 77
Acq Operator:  TNB                      Inj. No.:        1
                                           Inj. Vol.:       35 µl
=====

```

```

Acq. Method:   CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:  11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  0.000
=====

```

```

=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.973	PBA	175321.4	3.1756	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.992	PBA	58082.9	3.3608	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.998	PBA	203278.6	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\31DEC19D\31DECD08.D

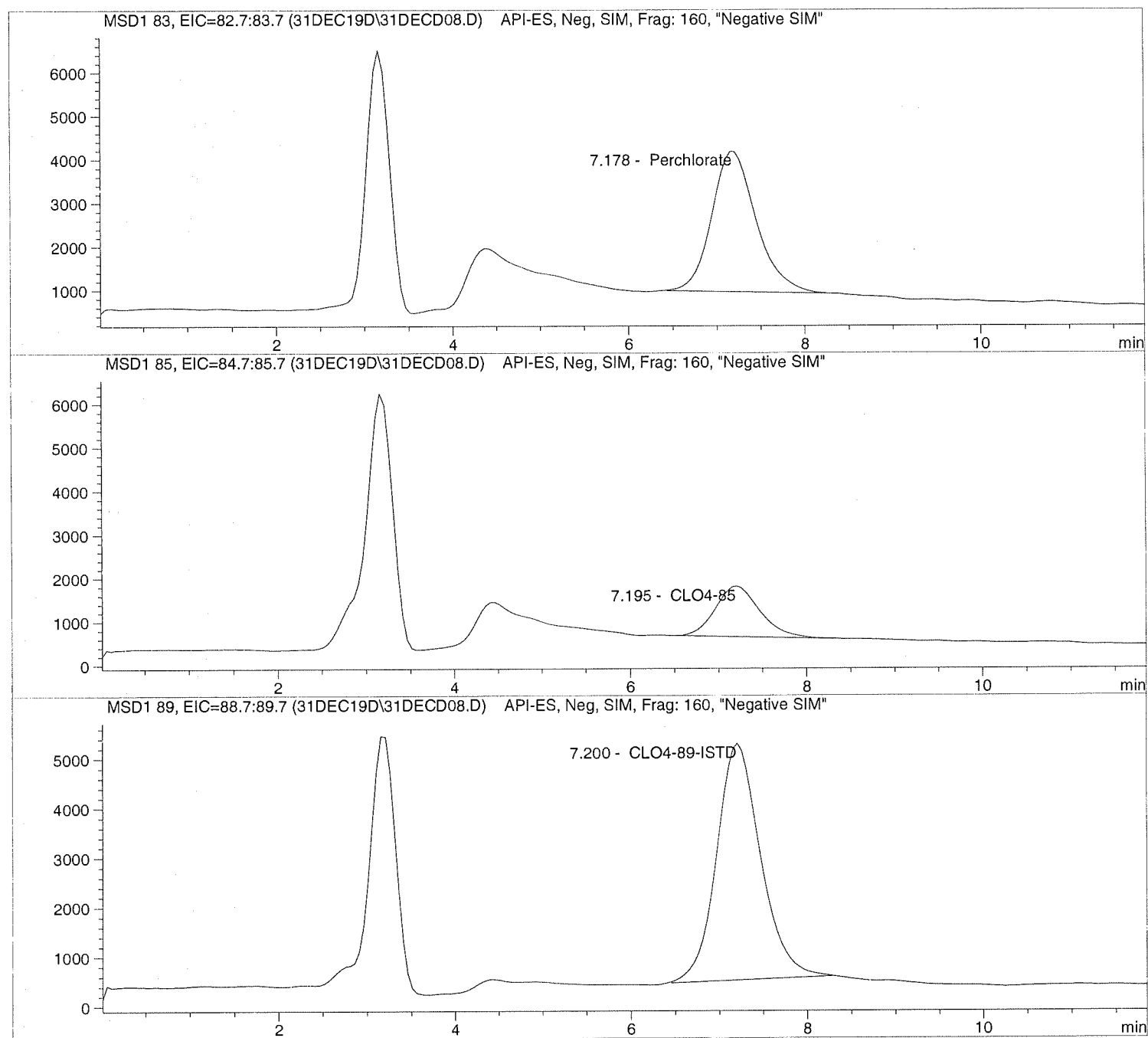
Sample Name: 1935354002

=====
Injection Date: 12/31/2019 09:54:04
Sample Name: 1935354002
Acq Operator: TNB

=====
Seq Line: 8
Location: Vial 78
Inj. No.: 1
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\31DEC19D\31DECD08.D Sample Name: 1935354002

```

=====
Injection Date: 12/31/2019 09:54:04      Seq Line:      8
Sample Name:    1935354002              Location:      Vial 78
Acq Operator:   TNB                     Inj. No.:     1
                                           Inj. Vol.:    35 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  0.000
=====

```

```

=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.178	BBA	113654.5	2.5033	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.195	PBA	41066.1	2.8837	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.200	PBA	166542.0	5.0000	CLO4-89-ISTD

```

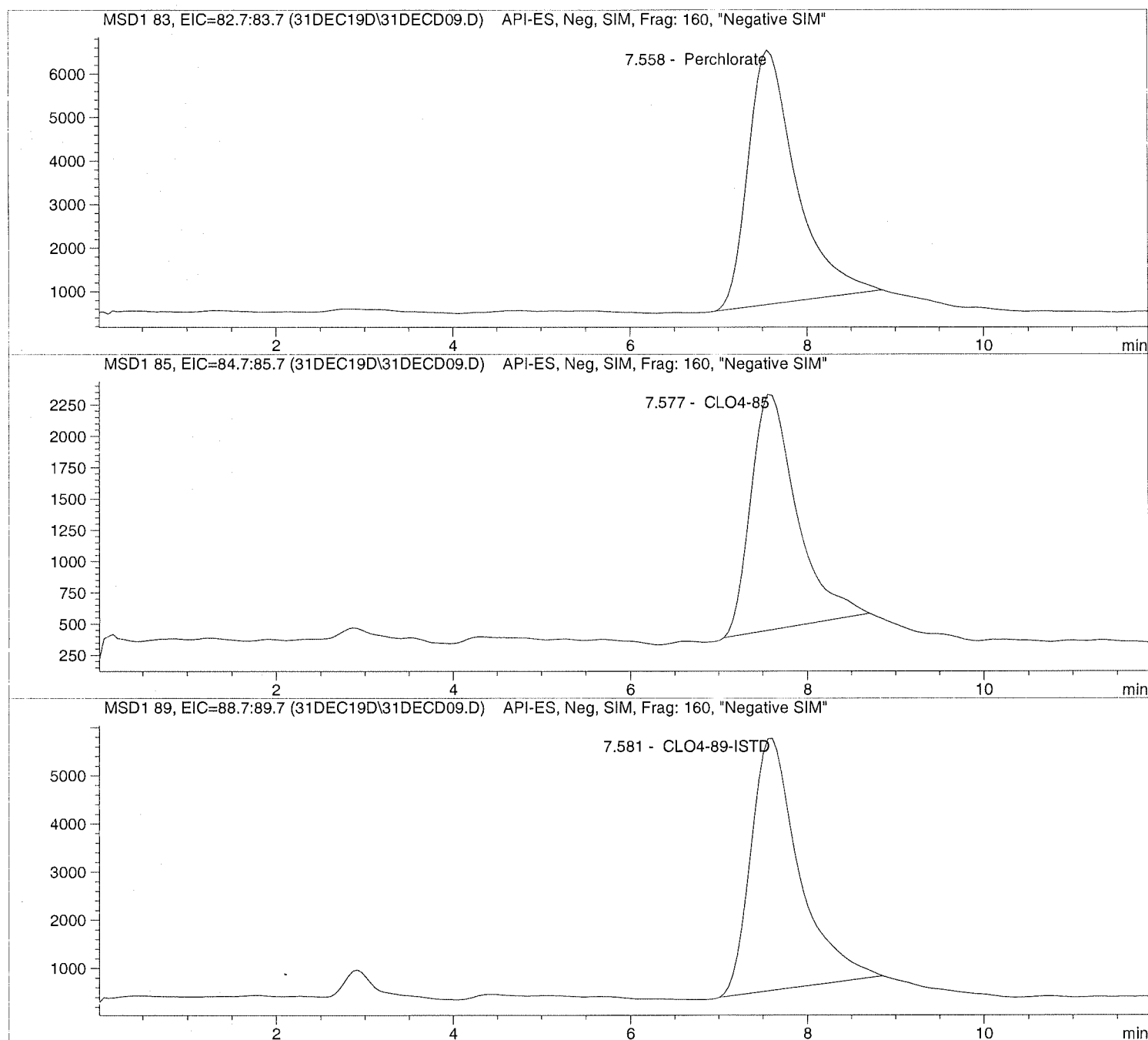
=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\31DEC19D\31DECD09.D Sample Name: 1935354003 100

=====
Injection Date: 12/31/2019 10:07:55 Seq Line: 9
Sample Name: 1935354003 100 Location: Vial 79
Acq Operator: TNB Inj. No.: 1
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis
=====

Data file: C:\HPCHEM\1\DATA\31DEC19D\31DECD09.D Sample Name: 1935354003 100

```

=====
Injection Date: 12/31/2019 10:07:55      Seq Line:          9
Sample Name:   1935354003 100           Location:         Vial 79
Acq Operator:  TNB                      Inj. No.:        1
                                           Inj. Vol.:       35 µl
=====

```

```

Acq. Method:   CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:  11/5/2019 08:44:45
=====

```

Perchlorate analysis

Sample Information

```

=====
Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:    1.000000
Dilution:      100.000000
Sample Amount: 0.000
=====

```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.558	PBA	220203.6	409.6261	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.577	PBA	68004.8	405.5794	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.581	PBA	198232.1	500.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\31DEC19D\31DECD11.D

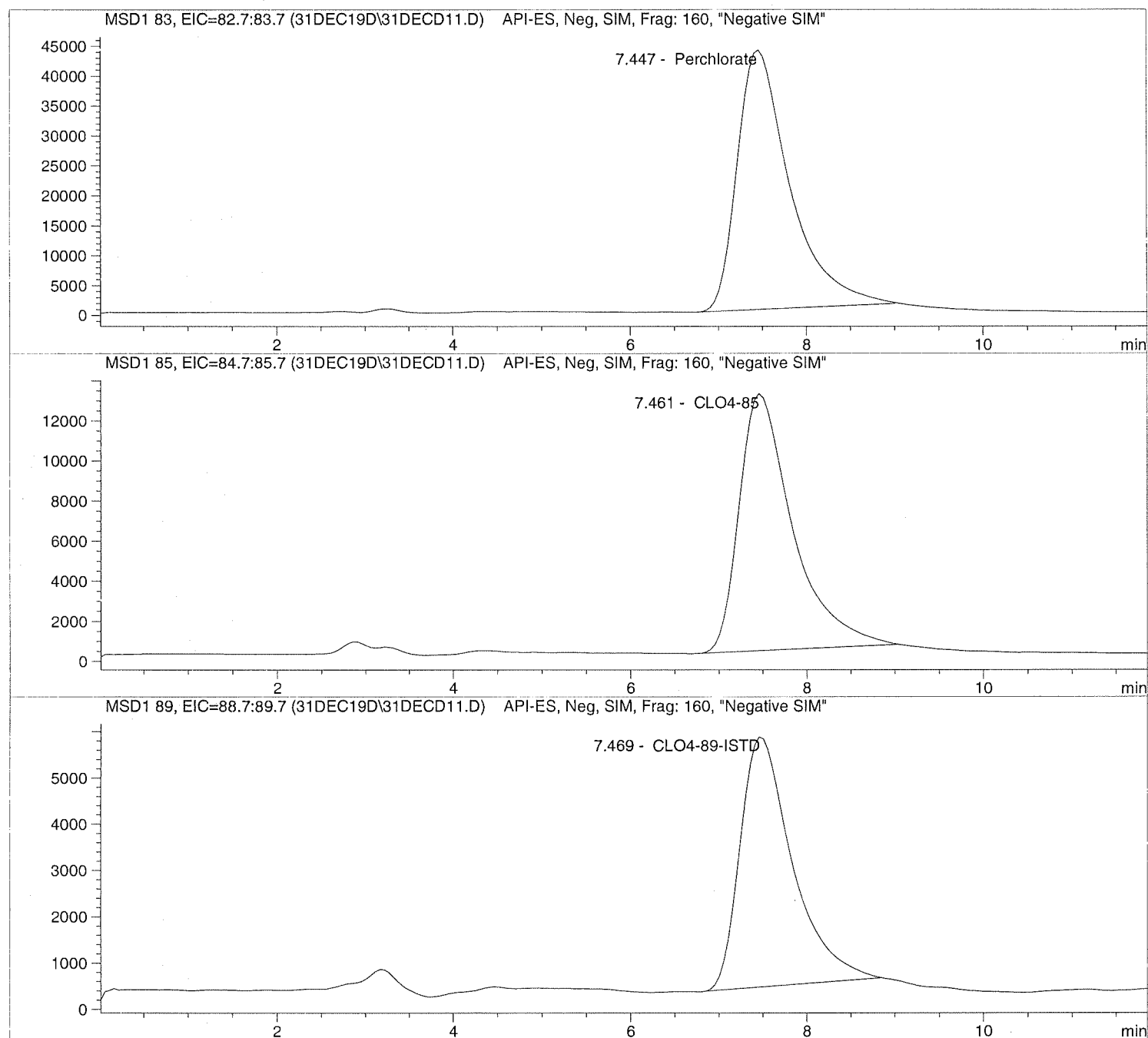
Sample Name: 1935354005

Injection Date: 12/31/2019 10:35:41
Sample Name: 1935354005
Acq Operator: TNB

Seq Line: 11
Location: Vial 81
Inj. No.: 1
Inj. Vol.: 35 μ l

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\31DEC19D\31DECD11.D Sample Name: 1935354005

```

=====
Injection Date: 12/31/2019 10:35:41      Seq Line:          11
Sample Name:   1935354005                Location:         Vial 81
Acq Operator:  TNB                       Inj. No.:        1
                                           Inj. Vol.:       35 µl
=====

```

```

Acq. Method:   CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:  11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  0.000
=====

```

```

=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.447	PBA	1798900.0	27.2895	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.461	PBA	542001.9	27.0152	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.469	PBA	223128.4	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\31DEC19D\31DECD12.D

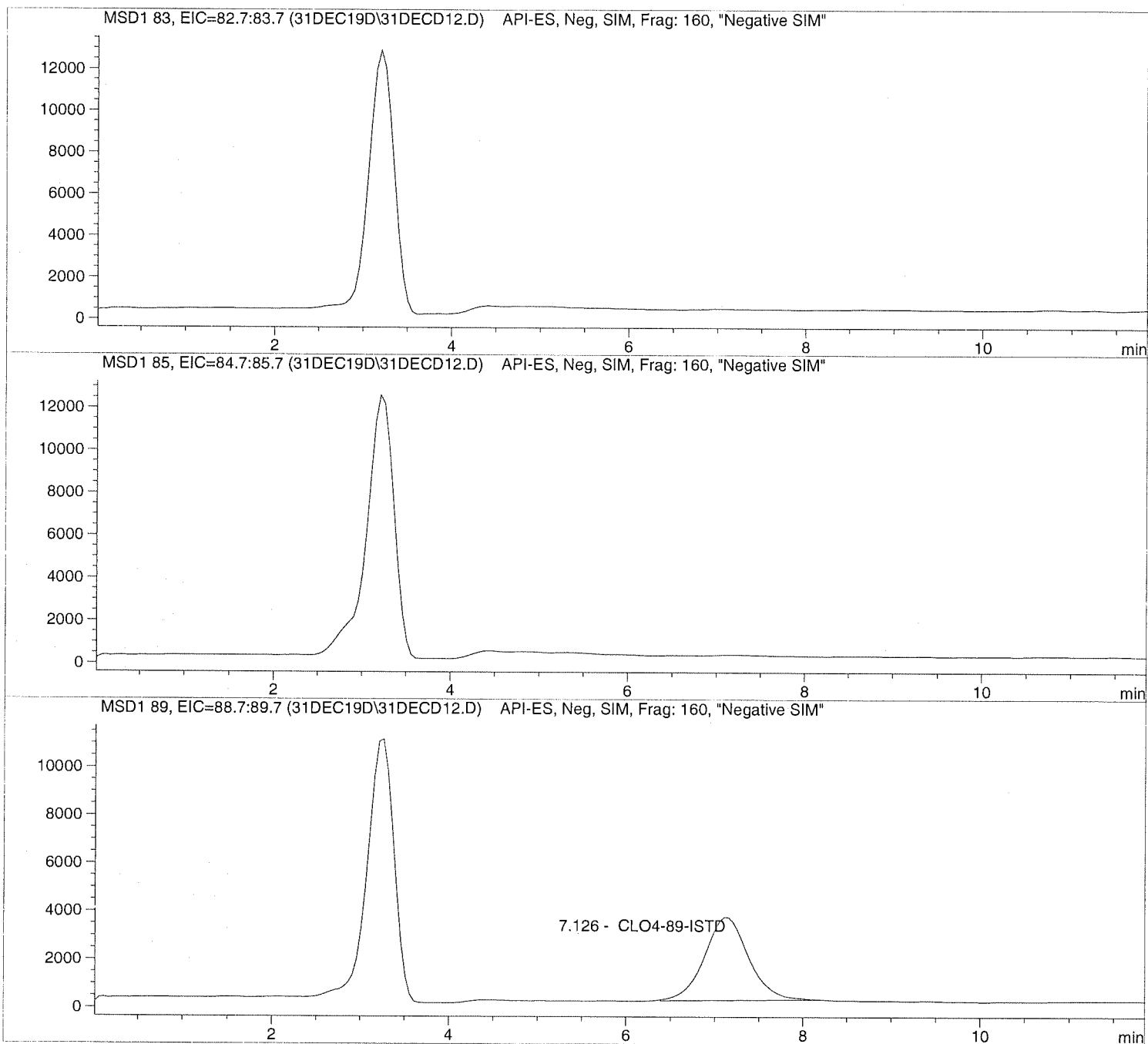
Sample Name: 1935354006

=====
Injection Date: 12/31/2019 10:49:31
Sample Name: 1935354006
Acq Operator: TNB

=====
Seq Line: 12
Location: Vial 82
Inj. No.: 1
Inj. Vol.: 35 µl

=====
Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\31DEC19D\31DECD12.D

Sample Name: 1935354006

```

=====
Injection Date: 12/31/2019 10:49:31      Seq Line:          12
Sample Name:   1935354006                Location:          Vial 82
Acq Operator:  TNB                       Inj. No.:         1
                                           Inj. Vol.:        35 µl
=====

```

```

Acq. Method:   CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:  11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:    1.000000
Dilution:      1.000000
Sample Amount: 0.000
=====

```

```

=====
                          LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.126	BBA	120568.9	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\31DEC19D\31DECD13.D

Sample Name: 1935354007

Injection Date: 12/31/2019 11:03:23

Seq Line: 13

Sample Name: 1935354007

Location: Vial 83

Acq Operator: TNB

Inj. No.: 1

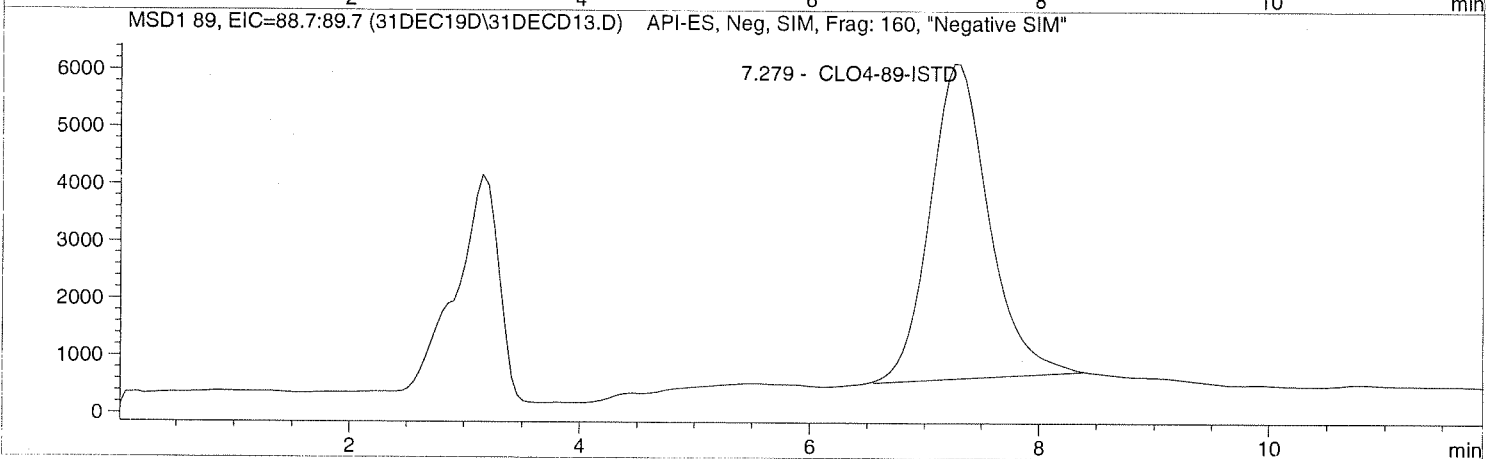
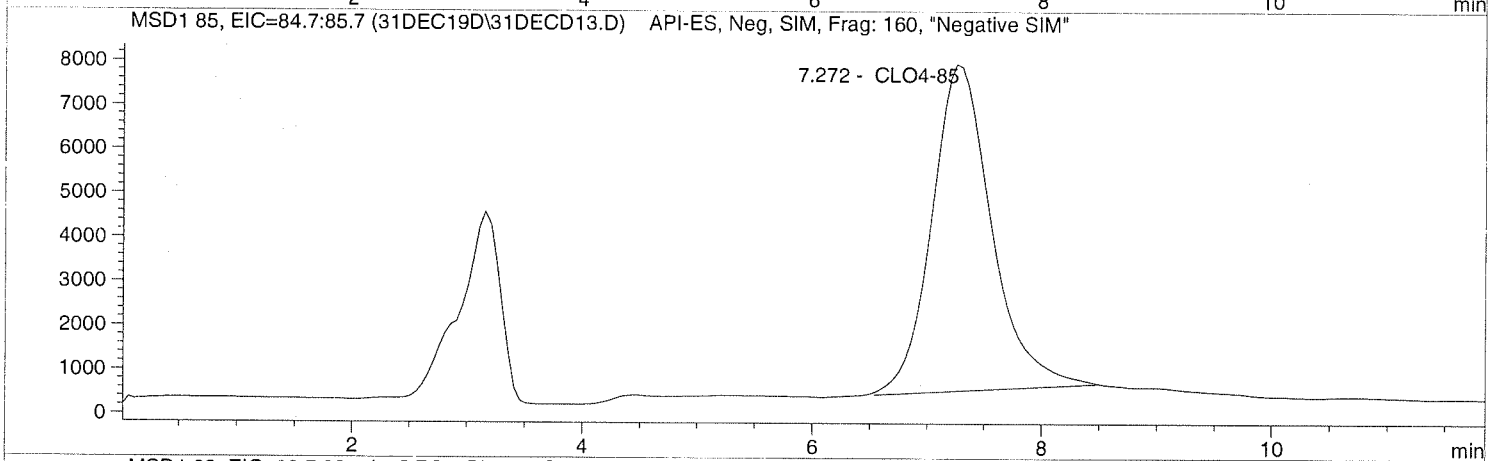
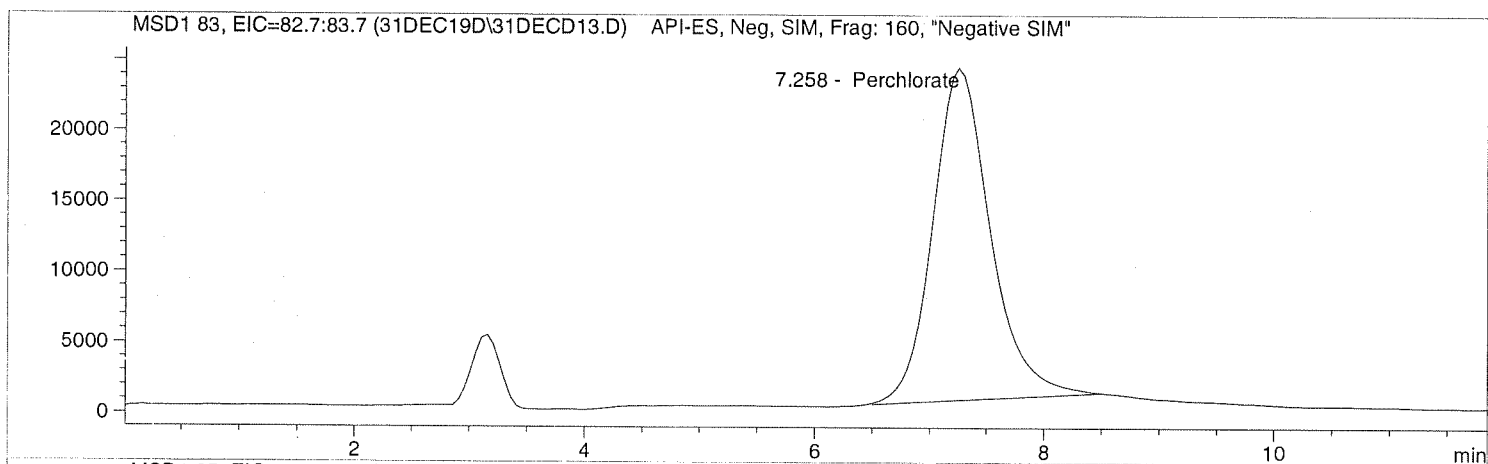
Inj. Vol.: 35 μ l

Acq. Method: CLO4-AQN.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M

Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\31DEC19D\31DECD13.D Sample Name: 1935354007

```

=====
Injection Date: 12/31/2019 11:03:23      Seq Line:          13
Sample Name:    1935354007                Location:          Vial 83
Acq Operator:   TNB                       Inj. No.:         1
                                           Inj. Vol.:        35 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  0.000
=====

```

```

=====
                          LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.258	PBA	825670.0	14.8823	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.272	PBA	269790.4	15.8164	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.279	PBA	197652.9	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

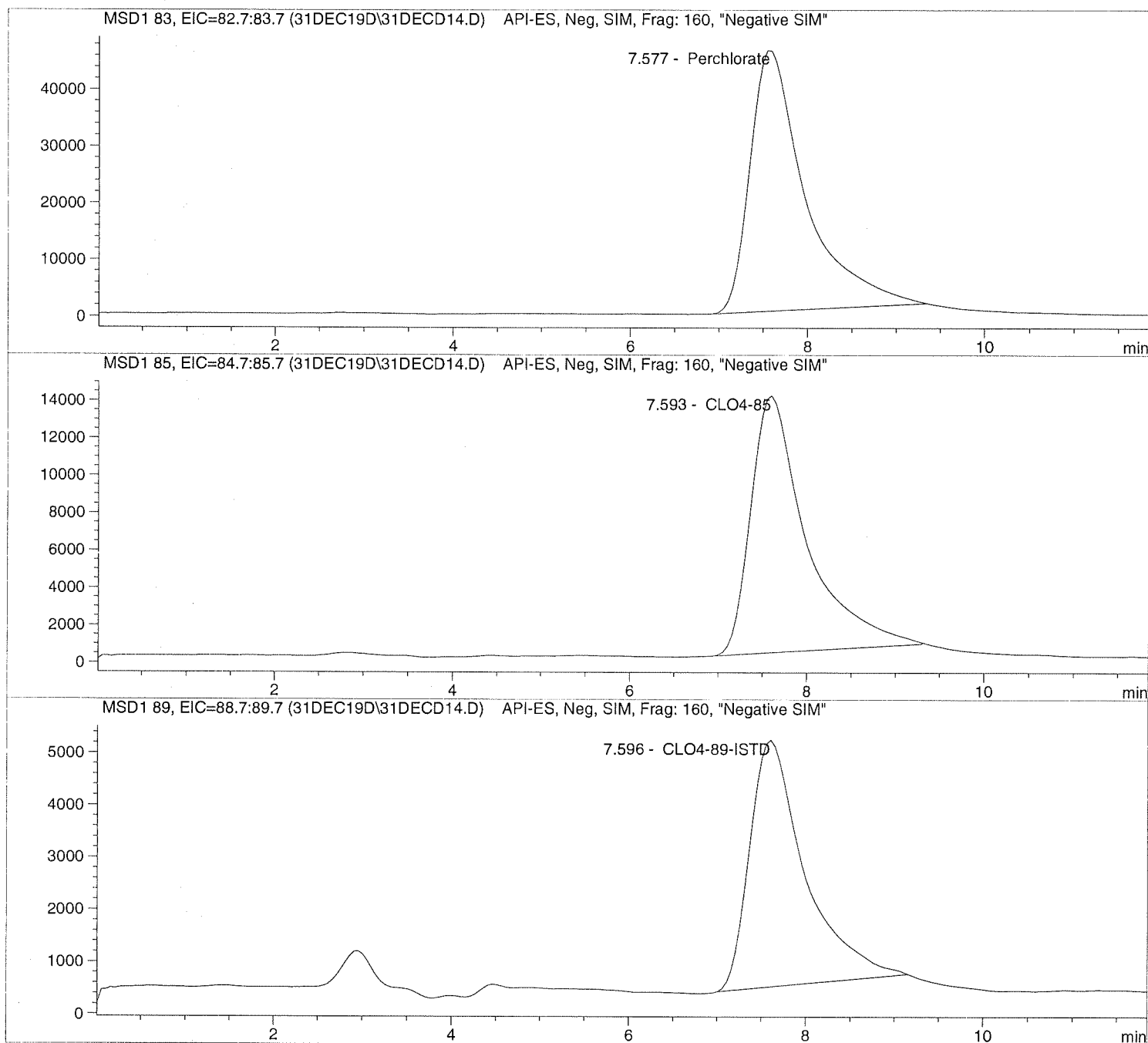
```

Data file: C:\HPCHEM\1\DATA\31DEC19D\31DECD14.D Sample Name: 1935354004 100

=====
Injection Date: 12/31/2019 11:17:14 Seq Line: 14
Sample Name: 1935354004 100 Location: Vial 84
Acq Operator: TNB Inj. No.: 1
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis
=====



Data file: C:\HPCHEM\1\DATA\31DEC19D\31DEC14.D Sample Name: 1935354004 100

```

=====
Injection Date: 12/31/2019 11:17:14      Seq Line:      14
Sample Name:   1935354004 100           Location:      Vial 84
Acq Operator:  TNB                       Inj. No.:     1
                                           Inj. Vol.:    35 µl
  
```

```

Acq. Method:   CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:  11/5/2019 08:44:45
  
```

Perchlorate analysis

Sample Information

```

=====
Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:    1.000000
Dilution:      100.000000
Sample Amount: 0.000
  
```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.577	PBA	1991813.6	3240.2236	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.593	PBA	598266.6	3204.3735	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.596	PBA	203781.5	500.0000	CLO4-89-ISTD

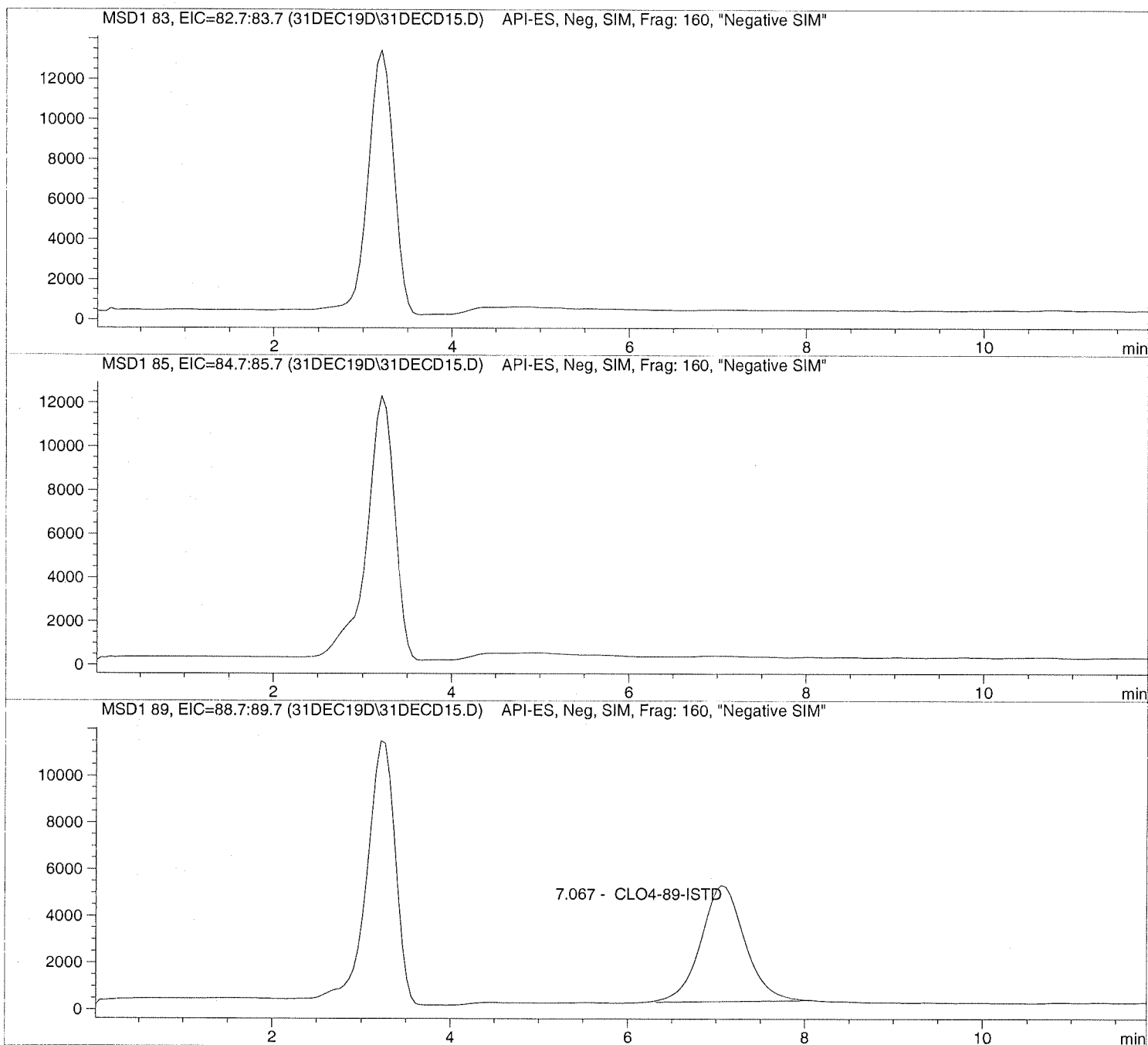
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\31DEC19D\31DECD15.D Sample Name: 1935354006 RE

```
=====
Injection Date: 12/31/2019 11:31:18      Seq Line:      15
Sample Name:    1935354006 RE            Location:      Vial 85
Acq Operator:   TNB                      Inj. No.:     1
                                           Inj. Vol.:    35 µl
=====
```

```
Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   11/5/2019 08:44:45
=====
```

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\31DEC19D\31DEC15.D Sample Name: 1935354006 RE

```
=====
Injection Date: 12/31/2019 11:31:18      Seq Line:      15
Sample Name:    1935354006 RE             Location:      Vial 85
Acq Operator:   TNB                       Inj. No.:     1
                                           Inj. Vol.:    35 µl
=====
```

```
Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   11/5/2019 08:44:45
```

Perchlorate analysis

Sample Information

```
Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  0.000
```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.067	BBA	170533.8	5.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\31DEC19D\31DECD16.D

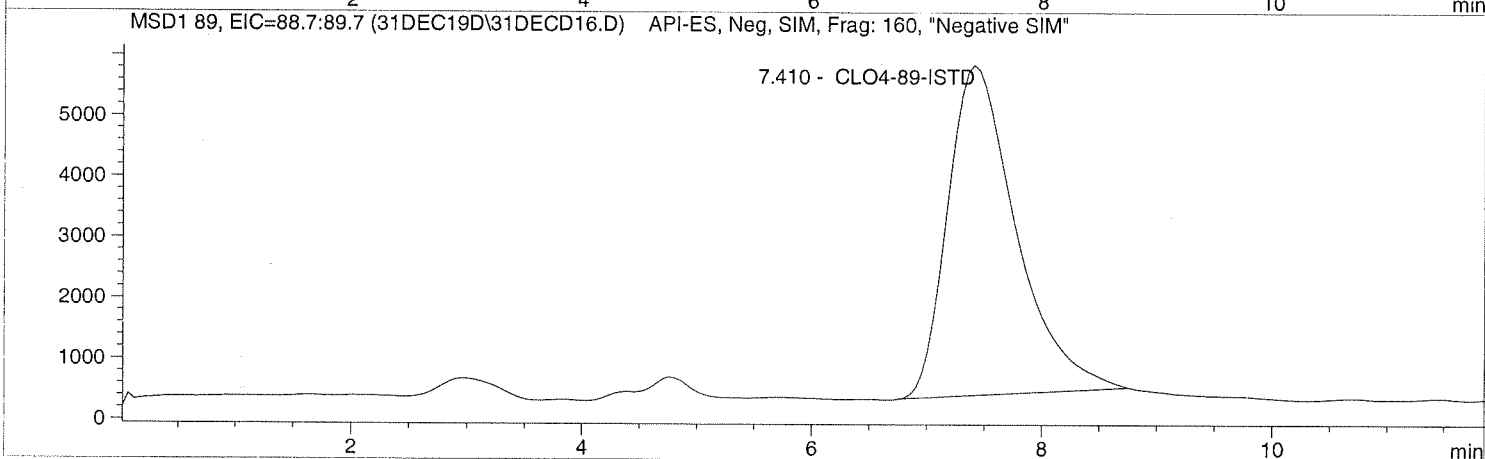
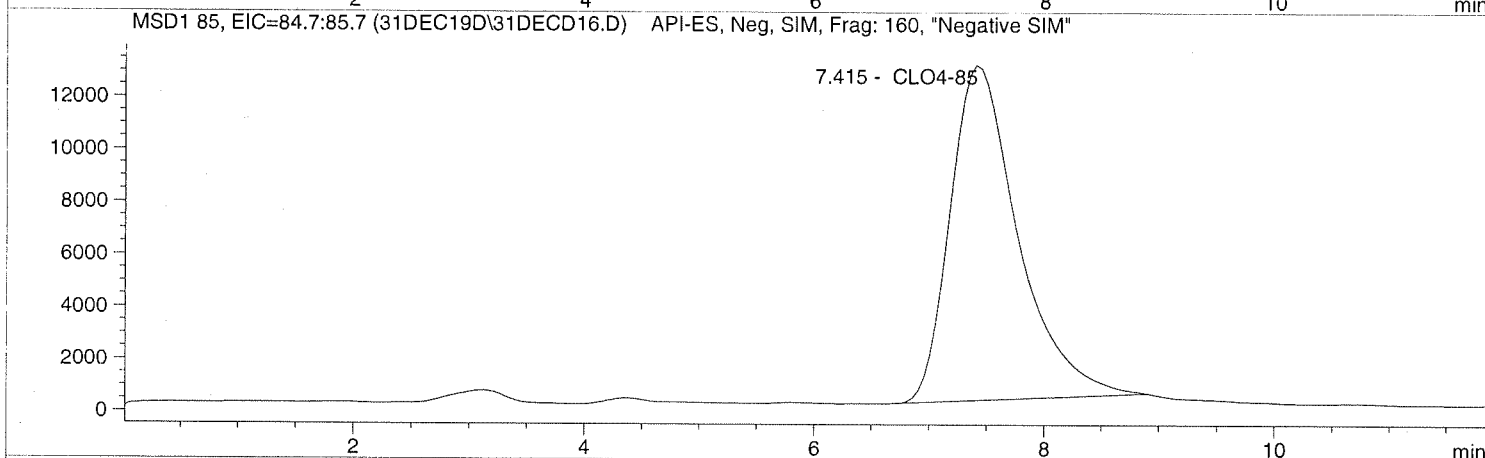
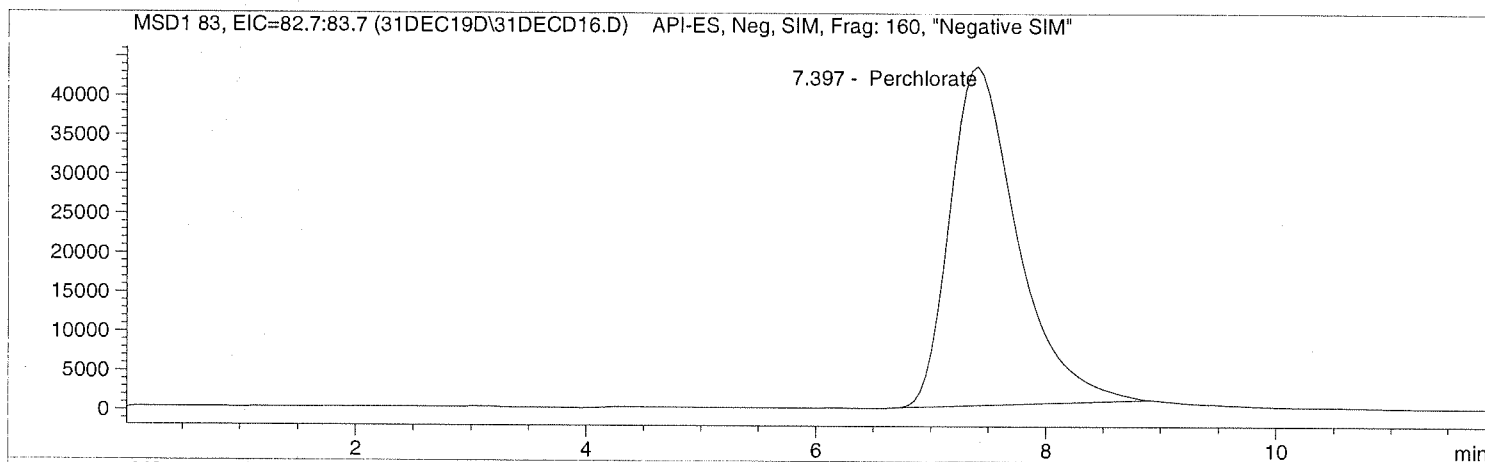
Sample Name: 690528 CCV@25

Injection Date: 12/31/2019 11:46:10
Sample Name: 690528 CCV@25
Acq Operator: TNB

Seq Line: 16
Location: Vial 71
Inj. No.: 1
Inj. Vol.: 35 μ l

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\31DEC19D\31DEC16.D Sample Name: 690528 CCV@25

```
=====
Injection Date: 12/31/2019 11:46:10      Seq Line: 16
Sample Name: 690528 CCV@25              Location: Vial 71
Acq Operator: TNB                        Inj. No.: 1
                                           Inj. Vol.: 35 µl
=====
```

```
Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45
=====
```

Perchlorate analysis

Sample Information

```
=====
Sorted By: Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 25.000
=====
```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.397	PBA	1759777.2	26.6016	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.415	PBA	523868.7	26.0402	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.410	PBA	224553.6	5.0000	CLO4-89-ISTD

*** End of Report ***



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Initial Calibration

=====
 Calibration Table
 =====

Perchlorate

Calib. Data Modified : 9/23/2019 12:20:59 PM
 Calculate : Internal Standard
 Based on : Peak Area
 Rel. Reference Window : 20.000 %
 Abs. Reference Window : 0.000 min
 Rel. Non-ref. Window : 20.000 %
 Abs. Non-ref. Window : 0.000 min
 Use Multiplier & Dilution Factor with ISTDs
 Uncalibrated Peaks : not reported
 Partial Calibration : No recalibration if peaks missing
 Curve Type : Quadratic (some peaks differ, see below)
 Origin : Ignored (some peaks differ, see below)
 Weight : Linear (Amnt) (some peaks differ, see below)
 Recalibration Settings:
 Average Response : Average all calibrations
 Average Retention Time: Floating Average New 75%

Calibration Report Options :
 Printout of recalibrations within a sequence:
 Calibration Table after Recalibration
 Normal Report after Recalibration
 If the sequence is done with bracketing:
 Results of first cycle (ending previous bracket)

Default Sample ISTD Information (if not set in sample table):

ISTD #	ISTD Amount	Name
1	5.00000	CLO4-89-ISTD

Signal 1: MSD1 83, EIC=82.7:83.7
 Signal 2: MSD1 85, EIC=84.7:85.7
 Signal 3: MSD1 89, EIC=88.7:89.7

RetTime [min]	Lvl Sig	Amount	Area	Amt/Area	Ref Grp	Name
7.750	1 3	1.00000	5.39218e4	1.85454e-5	1	Perchlorate
		2.00000	1.32825e5	1.50574e-5		
		5.00000	2.76271e5	1.80982e-5		
		10.00000	5.61298e5	1.78159e-5		
		25.00000	1.51820e6	1.64669e-5		
		50.00000	3.31156e6	1.50986e-5		
		75.00000	5.23914e6	1.43153e-5		
7.767	3 3	5.00000	2.14568e5	2.33026e-5	+I1	CLO4-89-ISTD
		5.00000	2.04758e5	2.44190e-5		
		5.00000	2.13407e5	2.34294e-5		
		5.00000	2.09246e5	2.38953e-5		
		5.00000	2.07403e5	2.41077e-5		
		5.00000	2.02929e5	2.46391e-5		
		5.00000	1.97933e5	2.52611e-5		
7.778	2 3	1.00000	1.70436e4	5.86732e-5	1	CLO4-85
		2.00000	4.20754e4	4.75337e-5		
		5.00000	9.24707e4	5.40712e-5		
		10.00000	1.68622e5	5.93041e-5		
		25.00000	4.63724e5	5.39114e-5		
		50.00000	9.95933e5	5.02042e-5		

RetTime [min]	Lvl Sig	Amount	Area	Amt/Area	Ref Grp Name
9		75.00000	1.58066e6	4.74484e-5	

More compound-specific settings:

Compound: Perchlorate

Time Window : From 3.581 min To 11.899 min
Curve Type : Quadratic
Origin : Ignored
Calibration Level Weights:/
Level 3 : 1
Level 4 : 0.5
Level 5 : 0.2
Level 6 : 0.1
Level 7 : 0.04
Level 8 : 0.02
Level 9 : 0.013333

Compound: CLO4-89-ISTD

Time Window : From 3.581 min To 11.896 min
Curve Type : Linear
Origin : Included
Calibration Level Weights:/
Level 3 : 1
Level 4 : 1
Level 5 : 1
Level 6 : 1
Level 7 : 1
Level 8 : 1
Level 9 : 1

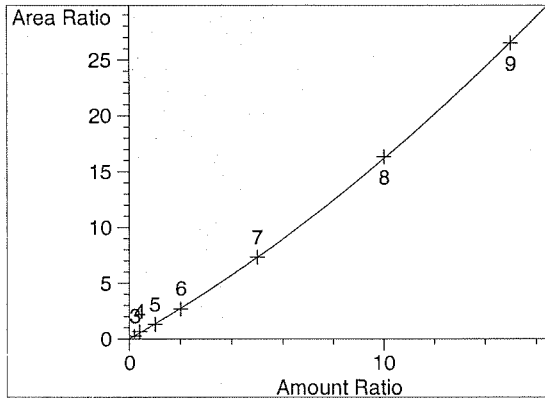
Compound: CLO4-85

Time Window : From 3.601 min To 11.913 min
Curve Type : Quadratic
Origin : Ignored
Calibration Level Weights:/
Level 3 : 1
Level 4 : 0.5
Level 5 : 0.2
Level 6 : 0.1
Level 7 : 0.04
Level 8 : 0.02
Level 9 : 0.013333

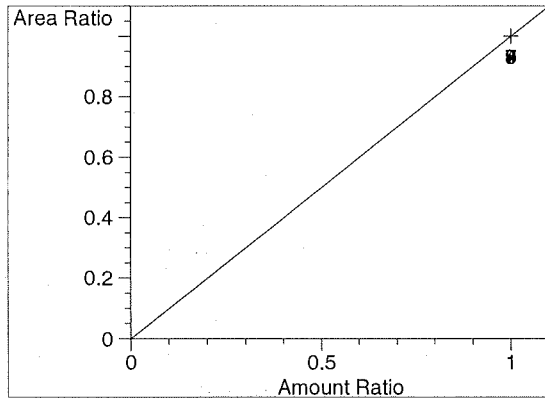
=====
Peak Sum Table
=====

No Entries in table
=====

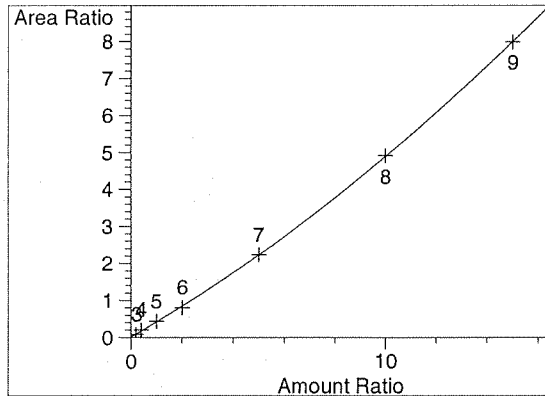
=====
 Calibration Curves
 =====



Perchlorate at exp. RT: 7.750
 MSD1 83, EIC=82.7:83.7
 Correlation: 0.99975
 Residual Std. Dev.: 0.10284
 Formula: $y = ax^2 + bx + c$
 a: 3.10463e-2
 b: 1.30369
 c: 2.19496e-2
 x: Amount Ratio
 y: Area Ratio
 Calibration Level Weights:
 Level 3 : 1
 Level 4 : 0.5
 Level 5 : 0.2
 Level 6 : 0.1
 Level 7 : 0.04
 Level 8 : 0.02
 Level 9 : 0.013333



CLO4-89-ISTD at exp. RT: 7.767
 MSD1 89, EIC=88.7:89.7
 Correlation: 1.00000
 Residual Std. Dev.: 0.00000
 Formula: $y = mx + b$
 m: 1.00000
 b: 0.00000
 x: Amount Ratio
 y: Area Ratio
 Calibration Level Weights:
 Level 3 : 1
 Level 4 : 1
 Level 5 : 1
 Level 6 : 1
 Level 7 : 1
 Level 8 : 1
 Level 9 : 1



CLO4-85 at exp. RT: 7.778
 MSD1 85, EIC=84.7:85.7
 Correlation: 0.99969
 Residual Std. Dev.: 0.02601
 Formula: $y = ax^2 + bx + c$
 a: 8.85207e-3
 b: 3.99283e-1
 c: 1.33505e-2
 x: Amount Ratio
 y: Area Ratio
 Calibration Level Weights:
 Level 3 : 1
 Level 4 : 0.5
 Level 5 : 0.2
 Level 6 : 0.1
 Level 7 : 0.04
 Level 8 : 0.02
 Level 9 : 0.013333

Batch Review Method:

C:\HPCHEM\1\METHODS\CLO4-DP3.M

['#' ==> Run has not been reprocessed with Batch Review Method

['*' ==> Run has been saved with batch file]

#*	Sample	Location	Inj	SampleType	Run	Perchlorate Area	Perchlorat RT	Perchlorate Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	5.39218e4	7.750	8.75982e-1
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	1.32825e5	7.797	2.37682
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	2.76271e5	7.770	4.77237
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	5.61298e5	7.785	9.75097
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	1.51820e6	7.741	25.01082
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	3.31156e6	7.775	50.40300
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	5.23914e6	7.736	74.79107
#*	ICAL Verf@10ug/L	Vial 80	1	Control	11	5.74879e5	7.756	10.11855

#*	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	2.14568e5	7.767	5.00000
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	2.04758e5	7.816	5.00000
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	2.13407e5	7.793	5.00000
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	2.09246e5	7.798	5.00000
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	2.07403e5	7.763	5.00000
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	2.02929e5	7.800	5.00000
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	1.97933e5	7.765	5.00000
#*	ICAL Verf@10ug/L	Vial 80	1	Control	11	2.06243e5	7.776	5.00000

#*	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	1.70436e4	7.778	8.24488e-1
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	4.20754e4	7.805	2.38090
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	9.24707e4	7.787	5.14166
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	1.68622e5	7.781	9.52209
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	4.63724e5	7.760	25.04916
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	9.95933e5	7.793	50.14223
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	1.58066e6	7.758	74.93659
#*	ICAL Verf@10ug/L	Vial 80	1	Control	11	1.71000e5	7.760	9.79043

*** End of Report ***

Sequence Table:

Method and Injection Info Part:

Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
====	=====	=====	=====	===	=====	=====	=====
1	Vial 71	CLO4@ 0.2ug/L	CLO4-AQN	1	Ctrl Samp		
2	Vial 72	CLO4@ 0.5ug/L	CLO4-AQN	1	Ctrl Samp		
3	Vial 73	CLO4@ 1.0ug/L	CLO4-AQN	1	Ctrl Samp		
4	Vial 74	CLO4@ 2.0ug/L	CLO4-AQN	1	Ctrl Samp		
5	Vial 75	CLO4@ 5.0ug/L	CLO4-AQN	1	Ctrl Samp		
6	Vial 76	CLO4@ 10.ug/L	CLO4-AQN	1	Ctrl Samp		
7	Vial 77	CLO4@ 25.ug/L	CLO4-AQN	1	Ctrl Samp		
8	Vial 78	CLO4@ 50.ug/L	CLO4-AQN	1	Ctrl Samp		
9	Vial 79	CLO4@ 75.ug/L	CLO4-AQN	1	Ctrl Samp		
10	Vial 71	CLO4@ 0.2ug/L	CLO4-AQN	1	Ctrl Samp		
11	Vial 80	ICAL Verf@10ug/L	CLO4-AQN	1	Ctrl Samp		

Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI03.D

Sample Name: CLO4@ 1.0ug/L

Injection Date: 9/20/2019 09:24:05

Seq Line: 3

Sample Name: CLO4@ 1.0ug/L

Location: Vial 73

Acq Operator: TNB

Inj. No.: 1

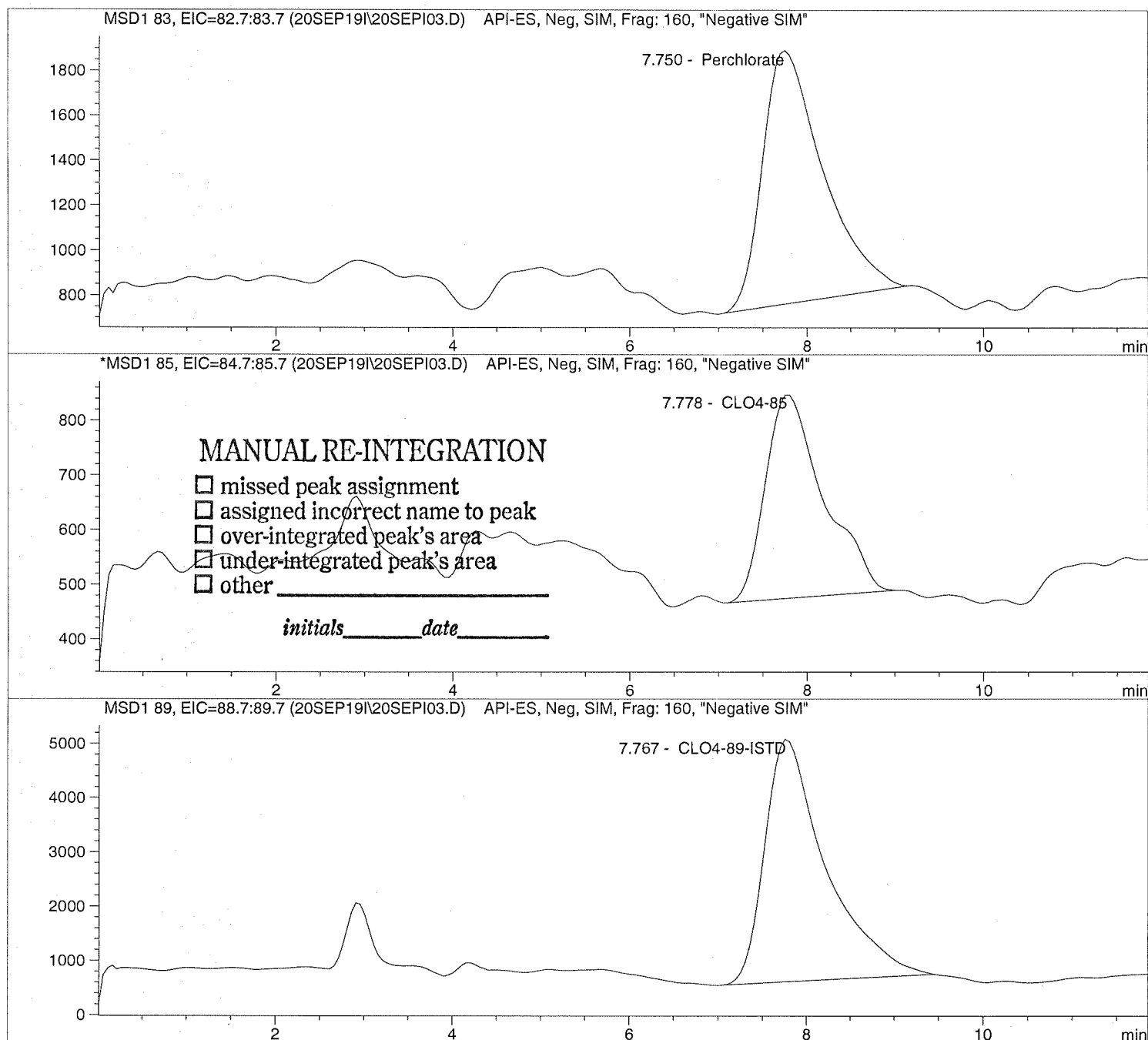
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M

Last Changed: 9/23/2019 12:21:47

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI03.D Sample Name: CLO4@ 1.0ug/L

```

=====
Injection Date: 9/20/2019 09:24:05      Seq Line:          3
Sample Name:   CLO4@ 1.0ug/L           Location:         Vial 73
Acq Operator:  TNB                     Inj. No.:        1
                                           Inj. Vol.:       30 µl
=====

```

```

Acq. Method:   CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:  9/23/2019 12:21:47
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  1.000
=====

```

```

=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.750	PBA	53921.8	0.8760	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.778	MM	17043.6	0.8245	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.767	PBA	214568.1	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI04.D

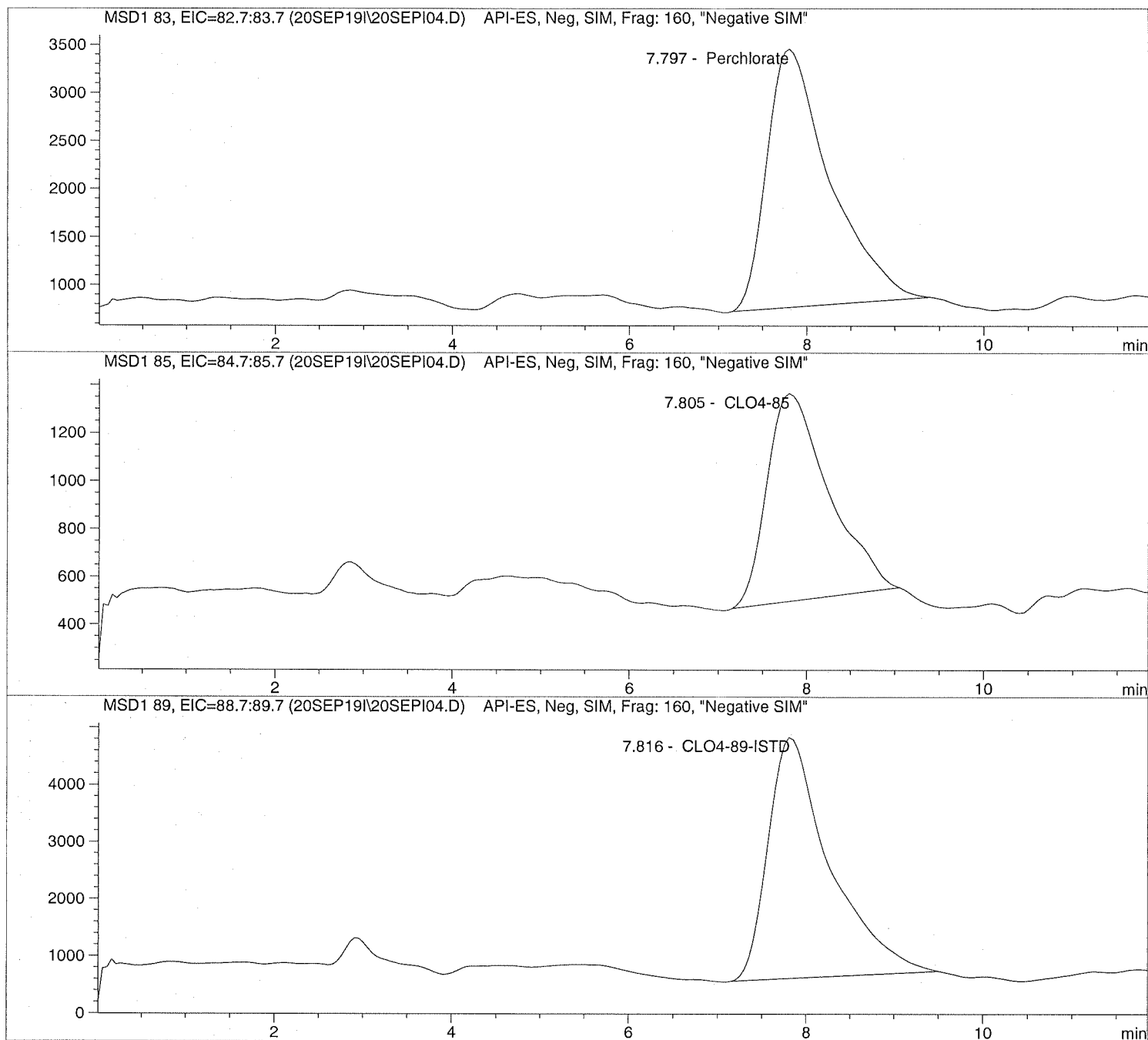
Sample Name: CLO4@ 2.0ug/L

Injection Date: 9/20/2019 09:37:58
Sample Name: CLO4@ 2.0ug/L
Acq Operator: TNB

Seq Line: 4
Location: Vial 74
Inj. No.: 1
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:21:47

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI04.D Sample Name: CLO4@ 2.0ug/L

```

=====
Injection Date: 9/20/2019 09:37:58      Seq Line: 4
Sample Name:    CLO4@ 2.0ug/L           Location:  Vial 74
Acq Operator:  TNB                      Inj. No.: 1
                                           Inj. Vol.: 30 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   9/23/2019 12:21:47
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  2.000
=====

```

```

=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.797	PBA	132825.2	2.3768	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.805	PBA	42075.4	2.3809	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.816	PBA	204758.3	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI05.D

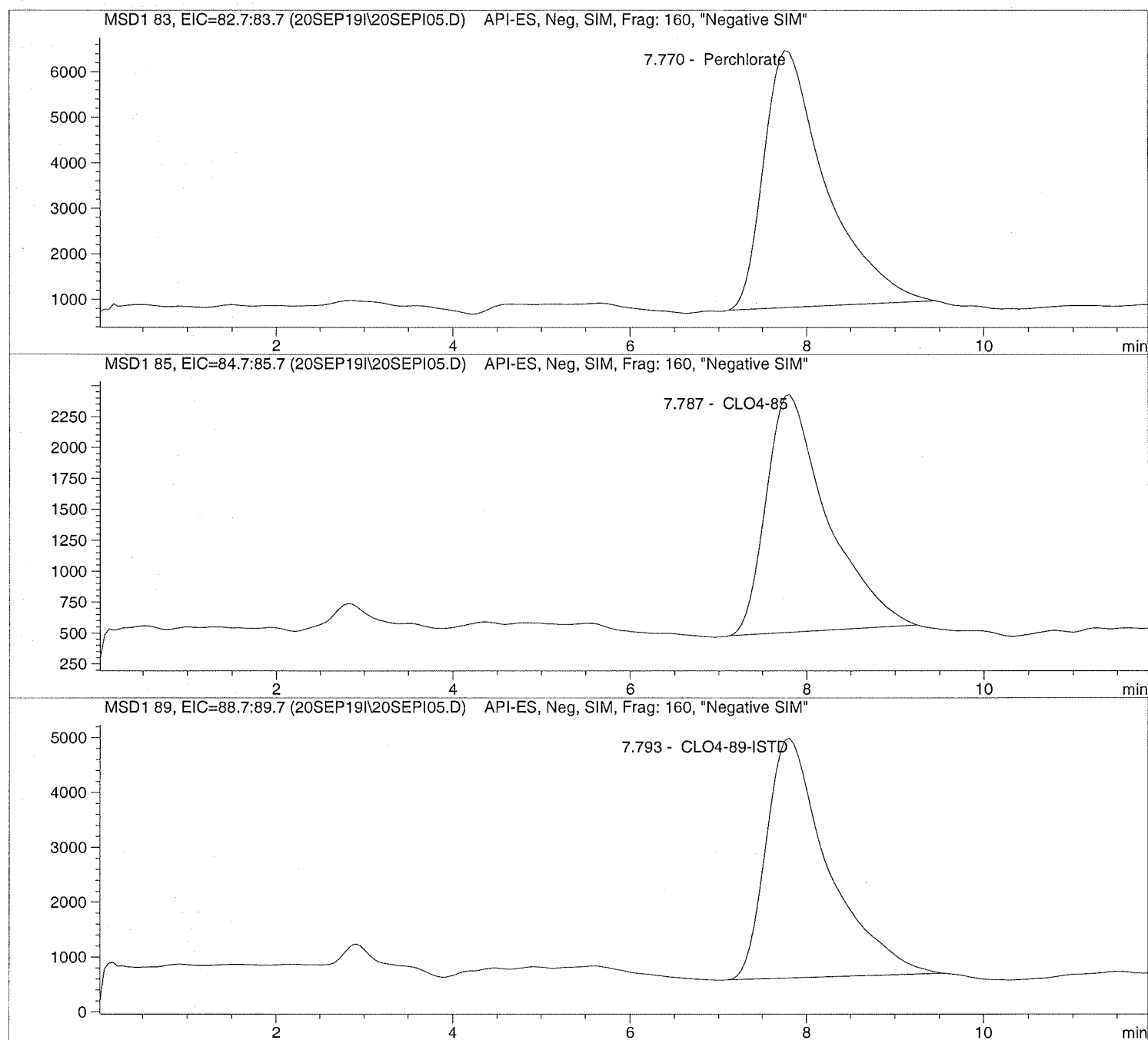
Sample Name: CLO4@ 5.0ug/L

Injection Date: 9/20/2019 09:51:49
Sample Name: CLO4@ 5.0ug/L
Acq Operator: TNB

Seq Line: 5
Location: Vial 75
Inj. No.: 1
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:21:47

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI05.D Sample Name: CLO4@ 5.0ug/L

```

=====
Injection Date:  9/20/2019  09:51:49      Seq Line:      5
Sample Name:    CLO4@ 5.0ug/L           Location:      Vial 75
Acq Operator:   TNB                      Inj. No.:     1
                                           Inj. Vol.:    30 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   9/23/2019  12:21:47
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  5.000
=====

```

```

=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.770	PBA	276270.7	4.7724	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.787	PBA	92470.7	5.1417	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.793	PBA	213407.0	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```


Data file: C:\HPCHEM\1\DATA\20SEP19\20SEPI06.D

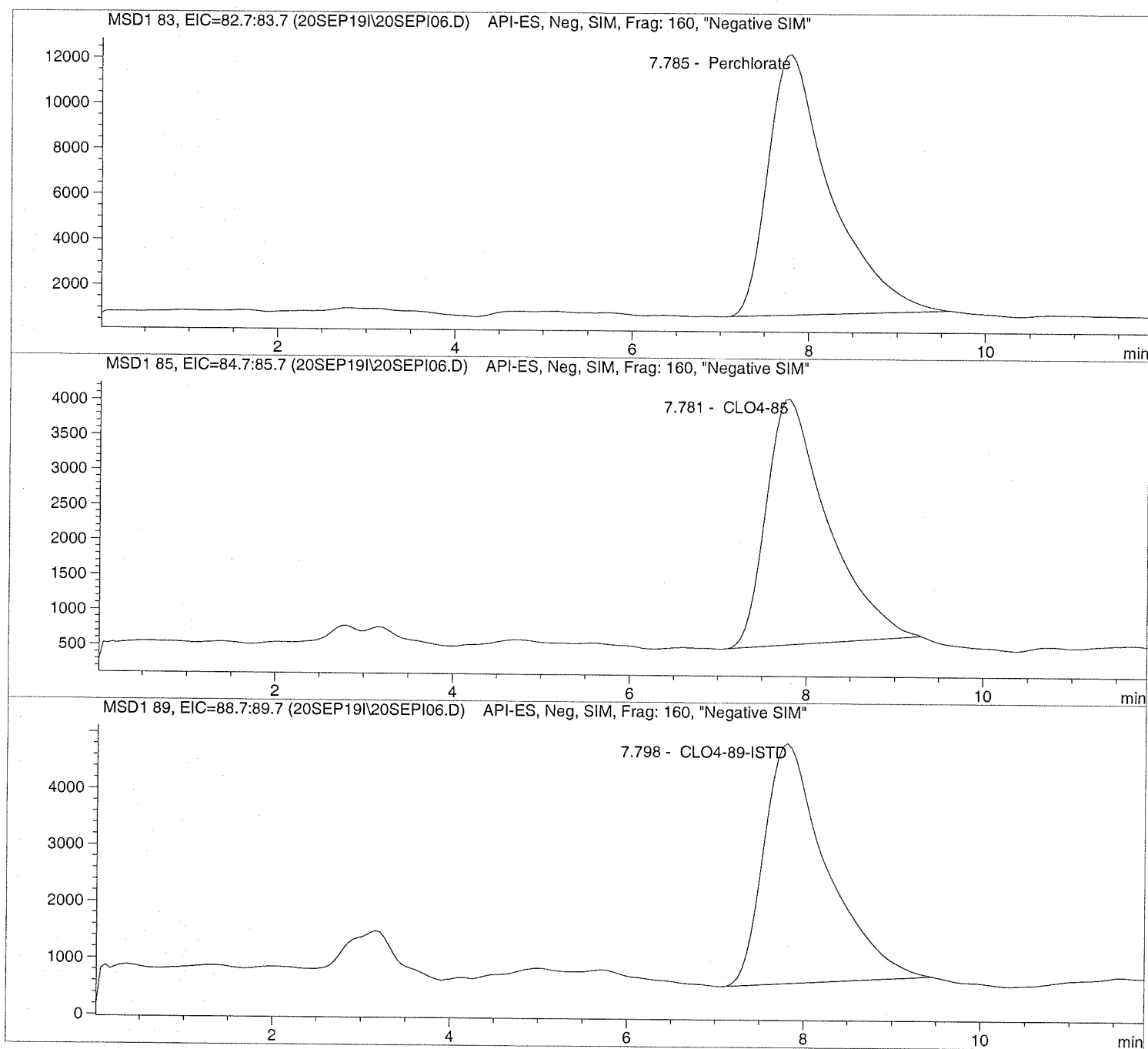
Sample Name: CLO4@ 10.ug/L

=====
Injection Date: 9/20/2019 10:05:36
Sample Name: CLO4@ 10.ug/L
Acq Operator: TNB

=====
Seq Line: 6
Location: Vial 76
Inj. No.: 1
Inj. Vol.: 30 µl

=====
Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:21:47

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI06.D Sample Name: CLO4@ 10.ug/L

```

=====
Injection Date: 9/20/2019 10:05:36      Seq Line: 6
Sample Name:    CLO4@ 10.ug/L           Location:  Vial 76
Acq Operator:   TNB                     Inj. No.: 1
                                           Inj. Vol.: 30 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   9/23/2019 12:21:47
=====

```

Perchlorate analysis

Sample Information

```

=====
Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:    1.000000
Dilution:      1.000000
Sample Amount: 10.000
=====

```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.785	PBA	561297.7	9.7510	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.781	PBA	168622.4	9.5221	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.798	PBA	209246.3	5.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\20SEP19\20SEPI07.D

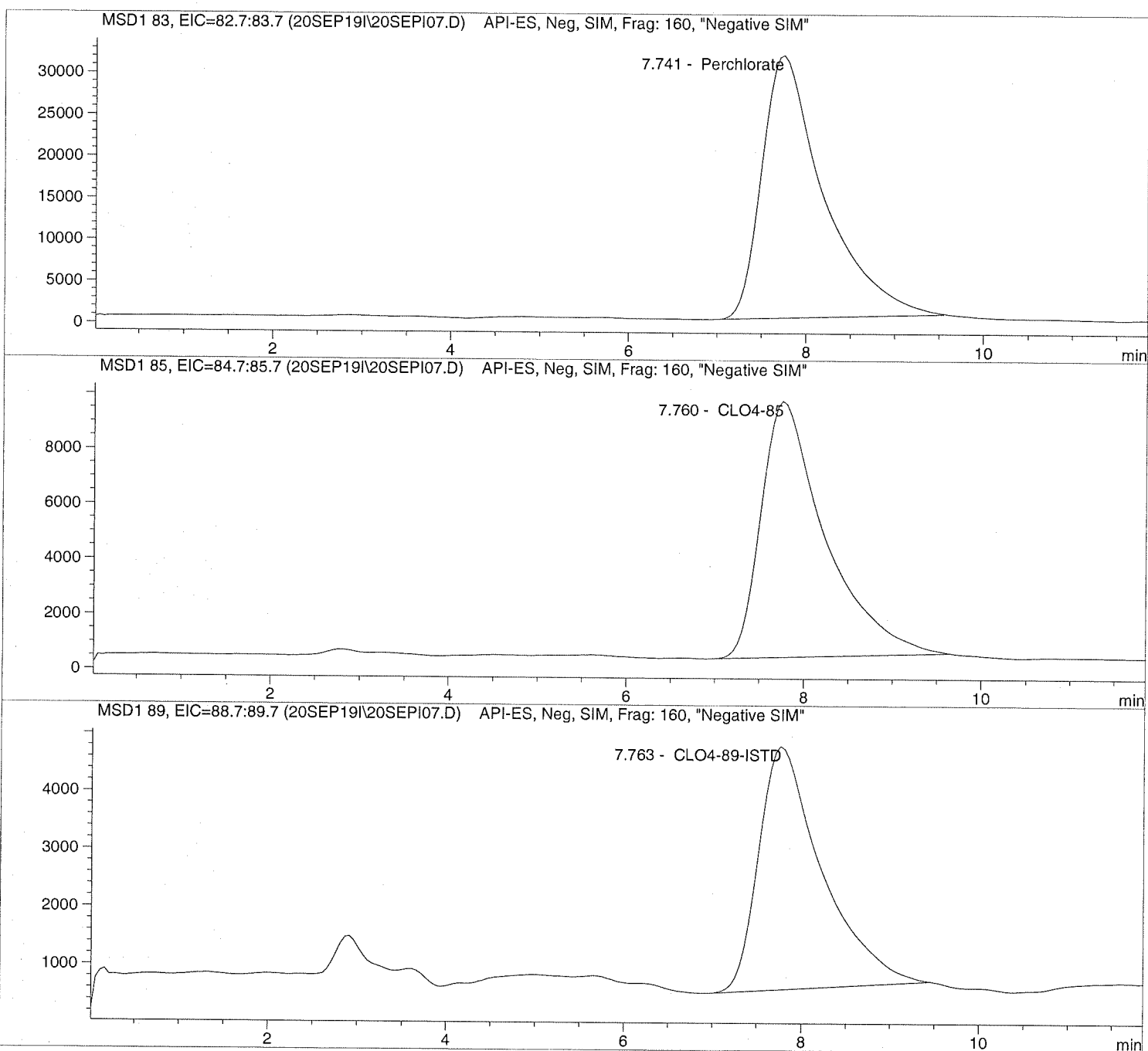
Sample Name: CLO4@ 25.ug/L

Injection Date: 9/20/2019 10:19:23
Sample Name: CLO4@ 25.ug/L
Acq Operator: TNB

Seq Line: 7
Location: Vial 77
Inj. No.: 1
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:21:47

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI07.D

Sample Name: CLO4@ 25.ug/L

```

=====
Injection Date: 9/20/2019 10:19:23      Seq Line: 7
Sample Name:    CLO4@ 25.ug/L           Location:  Vial 77
Acq Operator:   TNB                     Inj. No.: 1
                                           Inj. Vol.: 30 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   9/23/2019 12:21:47
=====

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:    1.000000
Dilution:      1.000000
Sample Amount: 25.000
=====

```

```

=====
                          LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.741	PBA	1518197.9	25.0108	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.760	PBA	463724.0	25.0492	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.763	PBA	207402.8	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

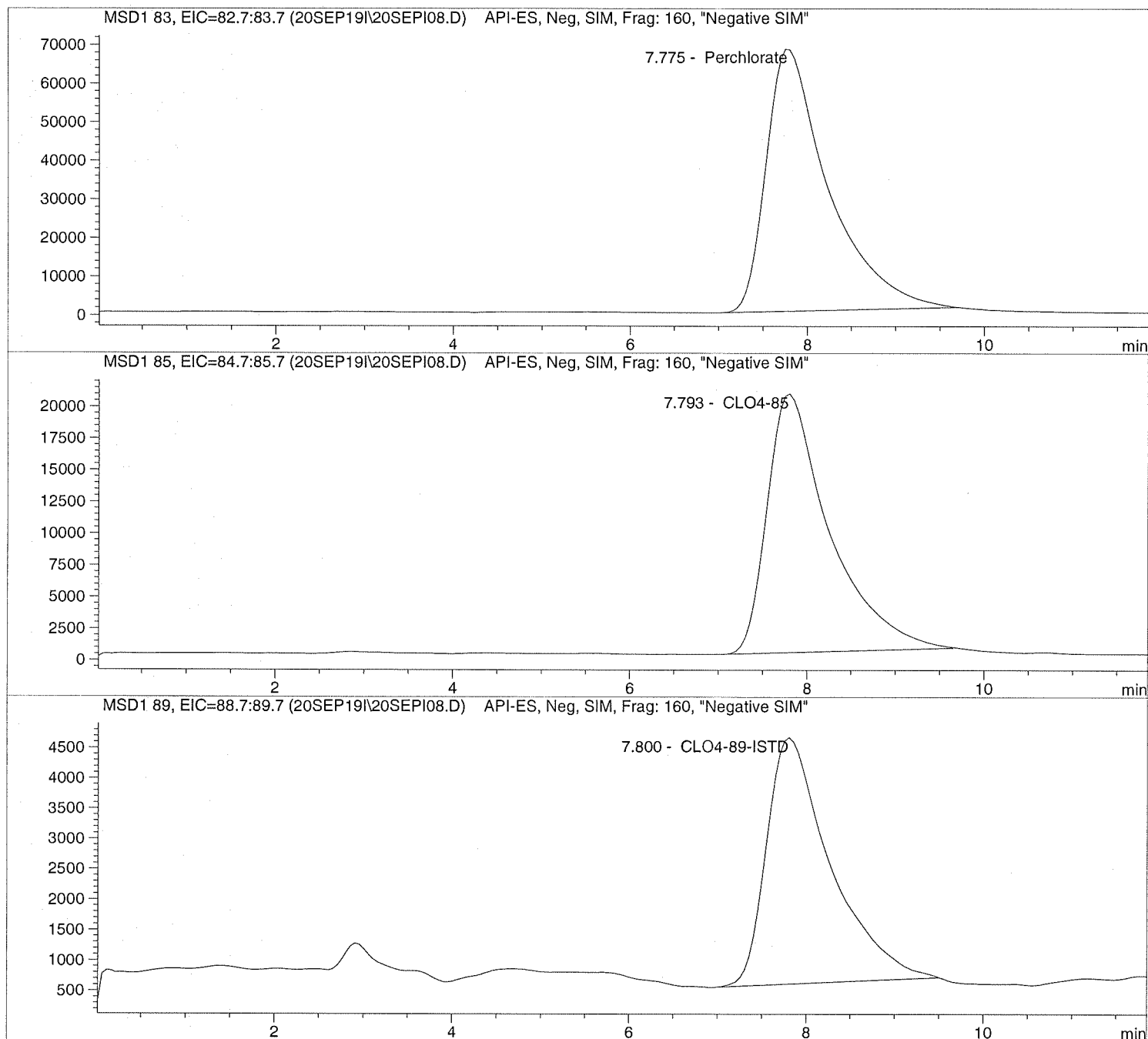
```

Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI08.D Sample Name: CLO4@ 50.ug/L

```
=====
Injection Date: 9/20/2019 10:33:18      Seq Line:      8
Sample Name:    CLO4@ 50.ug/L           Location:      Vial 78
Acq Operator:   TNB                     Inj. No.:     1
                                           Inj. Vol.:    30 µl
=====
```

```
Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   9/23/2019 12:21:47
```

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI08.D Sample Name: CLO4@ 50.ug/L

```

=====
Injection Date: 9/20/2019 10:33:18      Seq Line: 8
Sample Name: CLO4@ 50.ug/L      Location: Vial 78
Acq Operator: TNB      Inj. No.: 1
                                         Inj. Vol.: 30 µl

```

```

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:21:47

```

Perchlorate analysis

Sample Information

```

=====
Sorted By: Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 50.000

```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.775	PBA	3311559.2	50.4030	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.793	PBA	995933.0	50.1422	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.800	PBA	202929.2	5.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI09.D

Sample Name: CLO4@ 75.ug/L

Injection Date: 9/20/2019 10:47:05

Seq Line: 9

Sample Name: CLO4@ 75.ug/L

Location: Vial 79

Acq Operator: TNB

Inj. No.: 1

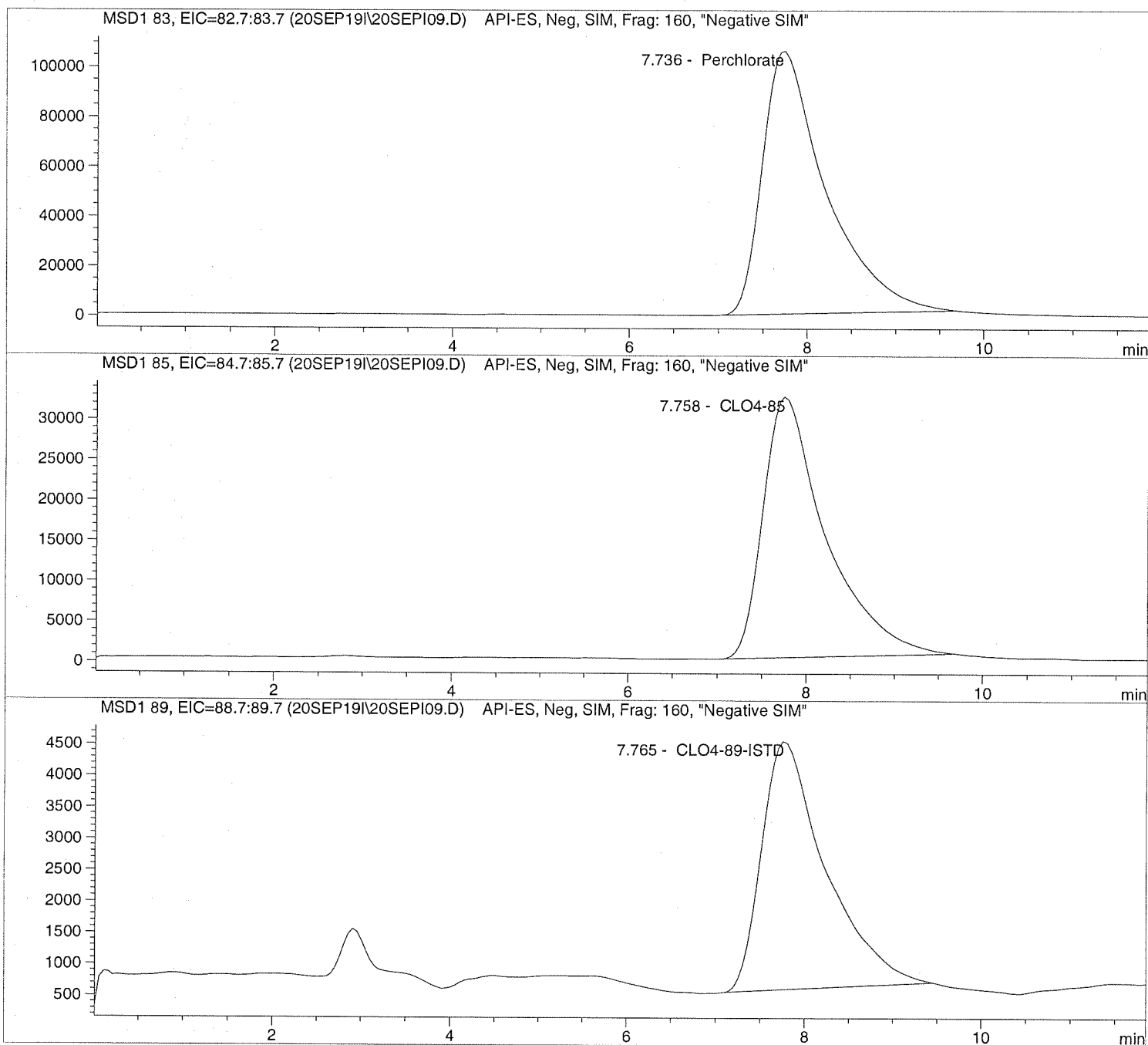
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M

Last Changed: 9/23/2019 12:21:47

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI09.D Sample Name: CLO4@ 75.ug/L

```

=====
Injection Date: 9/20/2019 10:47:05      Seq Line: 9
Sample Name:    CLO4@ 75.ug/L           Location:  Vial 79
Acq Operator:  TNB                      Inj. No.: 1
                                           Inj. Vol.: 30 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   9/23/2019 12:21:47
=====

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  75.000
=====

```

```

=====
                          LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.736	PBA	5239145.0	74.7911	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.758	PBA	1580664.2	74.9366	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.765	PBA	197932.5	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```


Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI11.D

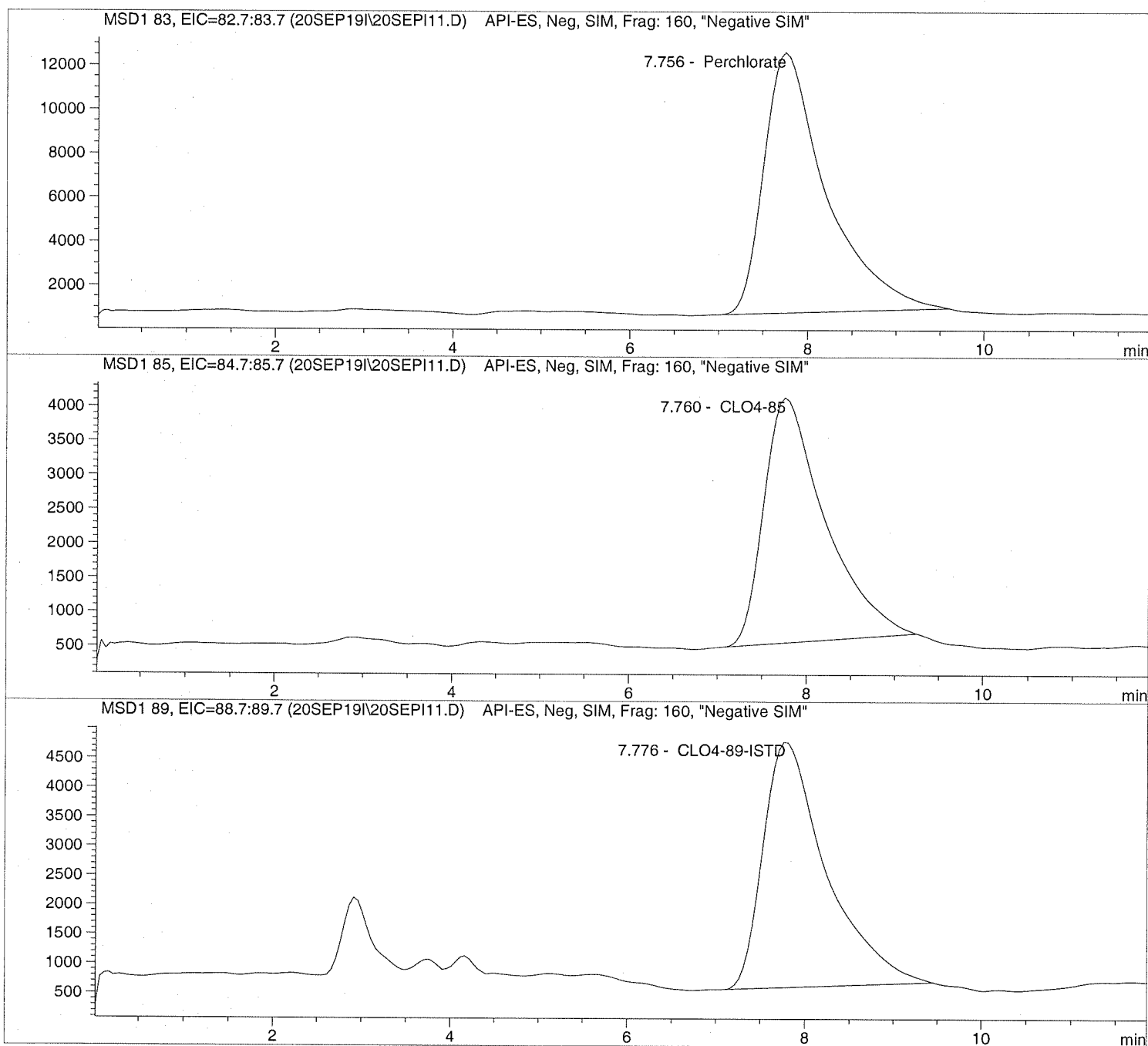
Sample Name: ICAL Verf@10ug/L

Injection Date: 9/20/2019 11:14:45
Sample Name: ICAL Verf@10ug/L
Acq Operator: TNB

Seq Line: 11
Location: Vial 80
Inj. No.: 1
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:21:47

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI11.D Sample Name: ICAL Verf@10ug/L

```

=====
Injection Date:  9/20/2019  11:14:45           Seq Line:           11
Sample Name:    ICAL Verf@10ug/L             Location:           Vial 80
Acq Operator:   TNB                          Inj. No.:          1
                                           Inj. Vol.:         30 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   9/23/2019  12:21:47
=====

```

Perchlorate analysis

Sample Information

```

=====
Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  10.000
=====

```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.756	PBA	574879.4	10.1185	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.760	PBA	171000.4	9.7904	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.776	PBA	206243.3	5.0000	CLO4-89-ISTD

*** End of Report ***



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Unmodified

Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI03.D

Sample Name: CLO4@ 1.0ug/L

Injection Date: 9/20/2019 09:24:05

Seq Line: 3

Sample Name: CLO4@ 1.0ug/L

Location: Vial 73

Acq Operator: TNB

Inj. No.: 1

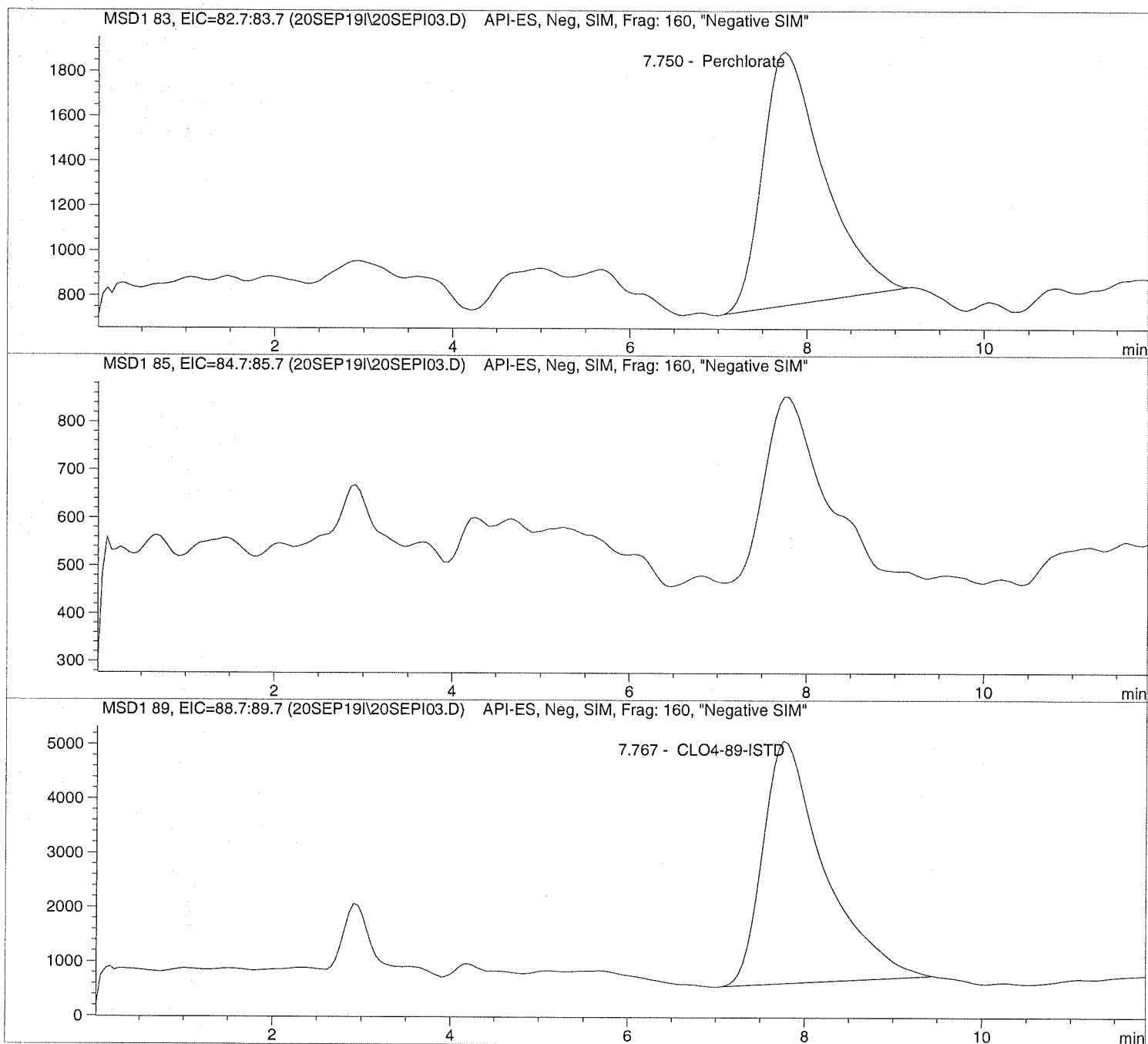
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M

Last Changed: 9/23/2019 12:27:11

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI03.D

Sample Name: CLO4@ 1.0ug/L

```

=====
Injection Date: 9/20/2019 09:24:05      Seq Line: 3
Sample Name:    CLO4@ 1.0ug/L           Location:  Vial 73
Acq Operator:  TNB                      Inj. No.: 1
                                           Inj. Vol.: 30 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   9/23/2019 12:27:11
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  1.000
=====

```

```

=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.750	PBA	53921.8	0.8760	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.767	PBA	214568.1	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```



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

December 30, 2019

Marcia Olive
Bhate Environmental Associates, Inc.
445 Union Blvd Ste 129
Lakewood, CO 80228

Work Order: **HS19120702**

Laboratory Results for: **LHAAP/Site 18/24**

Dear Marcia,

ALS Environmental received 6 sample(s) on Dec 12, 2019 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: JUMOKE.LAWAL
RJ Modashia
Project Manager

ALS Houston, US

Date: 30-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP/Site 18/24
Work Order: HS19120702

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19120702-01	MW21_121119	Groundwater		11-Dec-2019 08:55	12-Dec-2019 09:05	<input type="checkbox"/>
HS19120702-02	MW21_121119a	Groundwater		11-Dec-2019 08:55	12-Dec-2019 09:05	<input type="checkbox"/>
HS19120702-03	MW22_121119	Groundwater		11-Dec-2019 10:45	12-Dec-2019 09:05	<input type="checkbox"/>
HS19120702-04	18CPTMW06_121119	Groundwater		11-Dec-2019 12:15	12-Dec-2019 09:05	<input type="checkbox"/>
HS19120702-05	18CPTMW03SW_121119	Groundwater		11-Dec-2019 01:33	12-Dec-2019 09:05	<input type="checkbox"/>
HS19120702-06	Trip Blank	Groundwater		11-Dec-2019 00:00	12-Dec-2019 09:05	<input type="checkbox"/>

ALS Houston, US

Date: 30-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP/Site 18/24
Work Order: HS19120702

CASE NARRATIVE**Work Order Comments**

- The analysis for Perchlorate was subcontracted to ALS Salt Lake City, UT. Final report attached.

GCMS Semivolatiles by Method SW8270SIM**Batch ID: 148814**

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

GCMS Volatiles by Method SW8260**Batch ID: R352668****Sample ID: CCV**

- Carbon disulfide exceeded %D limits for CCV. Samples are ND for this compound.

Sample ID: MW22_121119 (HS19120702-03MS)

- MS/MSD failed QC and RPD limits for some compounds.

Metals by Method SW6020**Batch ID: 149105****Sample ID: MW22_121119 (HS19120702-03MS)**

- The MS and/or MSD recovery was outside of the control; however, the result in the parent sample is greater than 4x the spike amount. Barium, Calcium, Chromium, Magnesium, Manganese, Nickel, Sodium

Sample ID: MW22_121119 (HS19120702-03PDS)

- The PDS recovery was outside method control limits, however the result in the parent sample is greater than 4x the spike amount. Barium, Calcium and Chromium
- The PDS recovery was outside method control limits, however the result in the parent sample is greater than 4x the spike amount. Sodium

Metals by Method SW7470**Batch ID: 149099**

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

ALS Houston, US

Date: 30-Dec-19

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP/Site 18/24
 Sample ID: MW21_121119
 Collection Date: 11-Dec-2019 08:55

ANALYTICAL REPORT
 WorkOrder:HS19120702
 Lab ID:HS19120702-01
 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	5.0	U	3.0	5.0	10	UG/L	10	16-Dec-2019 16:41	
1,1,1-Trichloroethane	5.0	U	2.0	5.0	10	UG/L	10	16-Dec-2019 16:41	
1,1,2,2-Tetrachloroethane	5.0	U	5.0	5.0	10	UG/L	10	16-Dec-2019 16:41	
1,1,2-Trichloroethane	6.6	J	3.0	5.0	10	UG/L	10	16-Dec-2019 16:41	
1,1-Dichloroethane	5.0	U	2.0	5.0	10	UG/L	10	16-Dec-2019 16:41	
1,1-Dichloroethene	5.0	U	2.0	5.0	10	UG/L	10	16-Dec-2019 16:41	
1,1-Dichloropropene	5.0	U	3.0	5.0	10	UG/L	10	16-Dec-2019 16:41	
1,2,3-Trichlorobenzene	5.0	U	4.0	5.0	10	UG/L	10	16-Dec-2019 16:41	
1,2,3-Trichloropropane	5.0	U	5.0	5.0	10	UG/L	10	16-Dec-2019 16:41	
1,2,4-Trichlorobenzene	5.0	U	5.0	5.0	10	UG/L	10	16-Dec-2019 16:41	
1,2,4-Trimethylbenzene	5.0	U	3.0	5.0	10	UG/L	10	16-Dec-2019 16:41	
1,2-Dibromo-3-chloropropane	5.0	U	2.0	5.0	10	UG/L	10	16-Dec-2019 16:41	
1,2-Dibromoethane	5.0	U	2.0	5.0	10	UG/L	10	16-Dec-2019 16:41	
1,2-Dichlorobenzene	5.0	U	5.0	5.0	10	UG/L	10	16-Dec-2019 16:41	
1,2-Dichloroethane	19		2.0	5.0	10	UG/L	10	16-Dec-2019 16:41	
1,2-Dichloropropane	5.0	U	5.0	5.0	10	UG/L	10	16-Dec-2019 16:41	
1,3,5-Trimethylbenzene	5.0	U	3.0	5.0	10	UG/L	10	16-Dec-2019 16:41	
1,3-Dichlorobenzene	5.0	U	4.0	5.0	10	UG/L	10	16-Dec-2019 16:41	
1,3-Dichloropropane	5.0	U	3.0	5.0	10	UG/L	10	16-Dec-2019 16:41	
1,4-Dichlorobenzene	5.0	U	4.0	5.0	10	UG/L	10	16-Dec-2019 16:41	
2,2-Dichloropropane	5.0	U	2.0	5.0	10	UG/L	10	16-Dec-2019 16:41	
2-Butanone	10	U	5.0	10	20	UG/L	10	16-Dec-2019 16:41	
2-Chlorotoluene	5.0	U	3.0	5.0	10	UG/L	10	16-Dec-2019 16:41	
2-Hexanone	10	U	10	10	20	UG/L	10	16-Dec-2019 16:41	
4-Chlorotoluene	5.0	U	4.0	5.0	10	UG/L	10	16-Dec-2019 16:41	
4-Isopropyltoluene	5.0	U	3.0	5.0	10	UG/L	10	16-Dec-2019 16:41	
4-Methyl-2-pentanone	10	U	7.0	10	20	UG/L	10	16-Dec-2019 16:41	
Acetone	10	U	4.0	10	20	UG/L	10	16-Dec-2019 16:41	
Benzene	5.0	U	2.0	5.0	10	UG/L	10	16-Dec-2019 16:41	
Bromobenzene	5.0	U	4.0	5.0	10	UG/L	10	16-Dec-2019 16:41	
Bromochloromethane	5.0	U	2.0	5.0	10	UG/L	10	16-Dec-2019 16:41	
Bromodichloromethane	5.0	U	2.0	5.0	10	UG/L	10	16-Dec-2019 16:41	
Bromoform	5.0	U	4.0	5.0	10	UG/L	10	16-Dec-2019 16:41	
Bromomethane	5.0	U	4.0	5.0	10	UG/L	10	16-Dec-2019 16:41	
Carbon disulfide	10	U	6.0	10	20	UG/L	10	16-Dec-2019 16:41	
Carbon tetrachloride	5.0	U	5.0	5.0	10	UG/L	10	16-Dec-2019 16:41	
Chlorobenzene	5.0	U	3.0	5.0	10	UG/L	10	16-Dec-2019 16:41	
Chloroethane	5.0	U	3.0	5.0	10	UG/L	10	16-Dec-2019 16:41	
Chloroform	6.0	J	2.0	5.0	10	UG/L	10	16-Dec-2019 16:41	

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

ALS Houston, US

Date: 30-Dec-19

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP/Site 18/24
 Sample ID: MW21_121119
 Collection Date: 11-Dec-2019 08:55

ANALYTICAL REPORT

WorkOrder:HS19120702
 Lab ID:HS19120702-01
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED	
VOLATILES ORGANICS BY METHOD 8260C		Method:SW8260						Analyst: PC	
Chloromethane	5.0	U	2.0	5.0	10	UG/L	10	16-Dec-2019 16:41	
cis-1,2-Dichloroethene	400		2.0	5.0	10	UG/L	10	16-Dec-2019 16:41	
cis-1,3-Dichloropropene	5.0	U	1.0	5.0	10	UG/L	10	16-Dec-2019 16:41	
Dibromochloromethane	5.0	U	3.0	5.0	10	UG/L	10	16-Dec-2019 16:41	
Dibromomethane	5.0	U	2.0	5.0	10	UG/L	10	16-Dec-2019 16:41	
Dichlorodifluoromethane	5.0	U	3.0	5.0	10	UG/L	10	16-Dec-2019 16:41	
Ethylbenzene	5.0	U	3.0	5.0	10	UG/L	10	16-Dec-2019 16:41	
Hexachlorobutadiene	5.0	U	10	5.0	10	UG/L	10	16-Dec-2019 16:41	
Isopropylbenzene	5.0	U	3.0	5.0	10	UG/L	10	16-Dec-2019 16:41	
m,p-Xylene	10	U	5.0	10	20	UG/L	10	16-Dec-2019 16:41	
Methylene chloride	10	U	4.0	10	20	UG/L	10	16-Dec-2019 16:41	
n-Butylbenzene	5.0	U	4.0	5.0	10	UG/L	10	16-Dec-2019 16:41	
n-Propylbenzene	5.0	U	3.0	5.0	10	UG/L	10	16-Dec-2019 16:41	
Naphthalene	5.0	U	3.0	5.0	10	UG/L	10	16-Dec-2019 16:41	
o-Xylene	5.0	U	3.0	5.0	10	UG/L	10	16-Dec-2019 16:41	
sec-Butylbenzene	5.0	U	3.0	5.0	10	UG/L	10	16-Dec-2019 16:41	
Styrene	5.0	U	3.0	5.0	10	UG/L	10	16-Dec-2019 16:41	
tert-Butylbenzene	5.0	U	3.0	5.0	10	UG/L	10	16-Dec-2019 16:41	
Tetrachloroethene	5.0	U	3.0	5.0	10	UG/L	10	16-Dec-2019 16:41	
Toluene	5.0	U	2.0	5.0	10	UG/L	10	16-Dec-2019 16:41	
trans-1,2-Dichloroethene	5.0	U	2.0	5.0	10	UG/L	10	16-Dec-2019 16:41	
trans-1,3-Dichloropropene	5.0	U	2.0	5.0	10	UG/L	10	16-Dec-2019 16:41	
Trichloroethene	3,200		20	50	100	UG/L	100	16-Dec-2019 18:17	
Trichlorofluoromethane	5.0	U	3.0	5.0	10	UG/L	10	16-Dec-2019 16:41	
Vinyl chloride	9.2	J	2.0	5.0	10	UG/L	10	16-Dec-2019 16:41	
Surr: 1,2-Dichloroethane-d4	90.7			0	81-118	%REC	10	16-Dec-2019 16:41	
Surr: 1,2-Dichloroethane-d4	89.5			0	81-118	%REC	100	16-Dec-2019 18:17	
Surr: 4-Bromofluorobenzene	98.9			0	85-114	%REC	10	16-Dec-2019 16:41	
Surr: 4-Bromofluorobenzene	99.2			0	85-114	%REC	100	16-Dec-2019 18:17	
Surr: Dibromofluoromethane	93.0			0	80-119	%REC	10	16-Dec-2019 16:41	
Surr: Dibromofluoromethane	92.4			0	80-119	%REC	100	16-Dec-2019 18:17	
Surr: Toluene-d8	103			0	89-112	%REC	10	16-Dec-2019 16:41	
Surr: Toluene-d8	100			0	89-112	%REC	100	16-Dec-2019 18:17	
SEMIVOLATILES SIM		Method:SW8270SIM						Prep:SW3510 / 17-Dec-2019 Analyst: LG	
1,4-Dioxane	4.9		0.10	0.10	0.10	ug/L	10	23-Dec-2019 15:05	
Surr: 2-Fluorobiphenyl	95.3			0	40-140	%REC	10	23-Dec-2019 15:05	
Surr: 4-Terphenyl-d14	123			0	40-140	%REC	10	23-Dec-2019 15:05	
Surr: Nitrobenzene-d5	110			0	40-140	%REC	10	23-Dec-2019 15:05	

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

ALS Houston, US

Date: 30-Dec-19

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP/Site 18/24
 Sample ID: MW21_121119
 Collection Date: 11-Dec-2019 08:55

ANALYTICAL REPORT
 WorkOrder:HS19120702
 Lab ID:HS19120702-01
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A			Method:SW6020			Prep:SW3010A / 24-Dec-2019		Analyst: JHD
Aluminum	0.00790	J	0.00180	0.00500	0.0100	mg/L	1	27-Dec-2019 13:39
Antimony	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	27-Dec-2019 13:39
Arsenic	0.000444	J	0.000400	0.000500	0.00500	mg/L	1	27-Dec-2019 13:39
Barium	4.46		0.0380	0.0500	0.100	mg/L	20	27-Dec-2019 15:16
Beryllium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	27-Dec-2019 13:39
Cadmium	0.000516	J	0.000200	0.000500	0.00200	mg/L	1	27-Dec-2019 13:39
Calcium	170		0.0340	0.0500	0.500	mg/L	1	27-Dec-2019 13:39
Chromium	0.201		0.000400	0.000500	0.00500	mg/L	1	27-Dec-2019 13:39
Cobalt	0.0495		0.000100	0.000500	0.00500	mg/L	1	27-Dec-2019 13:39
Copper	0.0360		0.00100	0.00250	0.00500	mg/L	1	27-Dec-2019 13:39
Iron	2.92		0.0120	0.0500	0.200	mg/L	1	27-Dec-2019 13:39
Lead	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	27-Dec-2019 13:39
Magnesium	130		0.0100	0.0500	0.200	mg/L	1	27-Dec-2019 13:39
Manganese	1.60		0.000700	0.00250	0.00500	mg/L	1	27-Dec-2019 13:39
Nickel	0.549		0.000600	0.00100	0.00500	mg/L	1	27-Dec-2019 13:39
Potassium	2.09		0.0180	0.0500	0.200	mg/L	1	27-Dec-2019 13:39
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	27-Dec-2019 13:39
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	27-Dec-2019 13:39
Sodium	465		0.280	1.00	4.00	mg/L	20	27-Dec-2019 15:16
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	27-Dec-2019 13:39
Vanadium	0.00186	J	0.000600	0.00100	0.00500	mg/L	1	27-Dec-2019 13:39
Zinc	0.0199		0.00200	0.00250	0.00500	mg/L	1	27-Dec-2019 13:39
MERCURY BY SW7470A			Method:SW7470			Prep:SW7470 / 24-Dec-2019		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	24-Dec-2019 17:14
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)			Method:NA			Analyst: SUB		
Subcontract Analysis	See Attached		0	0		NA	1	30-Dec-2019 17:31

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

ALS Houston, US

Date: 30-Dec-19

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP/Site 18/24
 Sample ID: MW21_121119a
 Collection Date: 11-Dec-2019 08:55

ANALYTICAL REPORT
 WorkOrder:HS19120702
 Lab ID:HS19120702-02
 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	5.0	U	3.0	5.0	10	UG/L	10	16-Dec-2019 17:05	
1,1,1-Trichloroethane	5.0	U	2.0	5.0	10	UG/L	10	16-Dec-2019 17:05	
1,1,2,2-Tetrachloroethane	5.0	U	5.0	5.0	10	UG/L	10	16-Dec-2019 17:05	
1,1,2-Trichloroethane	6.1	J	3.0	5.0	10	UG/L	10	16-Dec-2019 17:05	
1,1-Dichloroethane	5.0	U	2.0	5.0	10	UG/L	10	16-Dec-2019 17:05	
1,1-Dichloroethene	5.0	U	2.0	5.0	10	UG/L	10	16-Dec-2019 17:05	
1,1-Dichloropropene	5.0	U	3.0	5.0	10	UG/L	10	16-Dec-2019 17:05	
1,2,3-Trichlorobenzene	5.0	U	4.0	5.0	10	UG/L	10	16-Dec-2019 17:05	
1,2,3-Trichloropropane	5.0	U	5.0	5.0	10	UG/L	10	16-Dec-2019 17:05	
1,2,4-Trichlorobenzene	5.0	U	5.0	5.0	10	UG/L	10	16-Dec-2019 17:05	
1,2,4-Trimethylbenzene	5.0	U	3.0	5.0	10	UG/L	10	16-Dec-2019 17:05	
1,2-Dibromo-3-chloropropane	5.0	U	2.0	5.0	10	UG/L	10	16-Dec-2019 17:05	
1,2-Dibromoethane	5.0	U	2.0	5.0	10	UG/L	10	16-Dec-2019 17:05	
1,2-Dichlorobenzene	5.0	U	5.0	5.0	10	UG/L	10	16-Dec-2019 17:05	
1,2-Dichloroethane	19		2.0	5.0	10	UG/L	10	16-Dec-2019 17:05	
1,2-Dichloropropane	5.0	U	5.0	5.0	10	UG/L	10	16-Dec-2019 17:05	
1,3,5-Trimethylbenzene	5.0	U	3.0	5.0	10	UG/L	10	16-Dec-2019 17:05	
1,3-Dichlorobenzene	5.0	U	4.0	5.0	10	UG/L	10	16-Dec-2019 17:05	
1,3-Dichloropropane	5.0	U	3.0	5.0	10	UG/L	10	16-Dec-2019 17:05	
1,4-Dichlorobenzene	5.0	U	4.0	5.0	10	UG/L	10	16-Dec-2019 17:05	
2,2-Dichloropropane	5.0	U	2.0	5.0	10	UG/L	10	16-Dec-2019 17:05	
2-Butanone	10	U	5.0	10	20	UG/L	10	16-Dec-2019 17:05	
2-Chlorotoluene	5.0	U	3.0	5.0	10	UG/L	10	16-Dec-2019 17:05	
2-Hexanone	10	U	10	10	20	UG/L	10	16-Dec-2019 17:05	
4-Chlorotoluene	5.0	U	4.0	5.0	10	UG/L	10	16-Dec-2019 17:05	
4-Isopropyltoluene	5.0	U	3.0	5.0	10	UG/L	10	16-Dec-2019 17:05	
4-Methyl-2-pentanone	10	U	7.0	10	20	UG/L	10	16-Dec-2019 17:05	
Acetone	10	U	4.0	10	20	UG/L	10	16-Dec-2019 17:05	
Benzene	5.0	U	2.0	5.0	10	UG/L	10	16-Dec-2019 17:05	
Bromobenzene	5.0	U	4.0	5.0	10	UG/L	10	16-Dec-2019 17:05	
Bromochloromethane	5.0	U	2.0	5.0	10	UG/L	10	16-Dec-2019 17:05	
Bromodichloromethane	5.0	U	2.0	5.0	10	UG/L	10	16-Dec-2019 17:05	
Bromoform	5.0	U	4.0	5.0	10	UG/L	10	16-Dec-2019 17:05	
Bromomethane	5.0	U	4.0	5.0	10	UG/L	10	16-Dec-2019 17:05	
Carbon disulfide	10	U	6.0	10	20	UG/L	10	16-Dec-2019 17:05	
Carbon tetrachloride	5.0	U	5.0	5.0	10	UG/L	10	16-Dec-2019 17:05	
Chlorobenzene	5.0	U	3.0	5.0	10	UG/L	10	16-Dec-2019 17:05	
Chloroethane	5.0	U	3.0	5.0	10	UG/L	10	16-Dec-2019 17:05	
Chloroform	6.4	J	2.0	5.0	10	UG/L	10	16-Dec-2019 17:05	

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

ALS Houston, US

Date: 30-Dec-19

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP/Site 18/24
 Sample ID: MW21_121119a
 Collection Date: 11-Dec-2019 08:55

ANALYTICAL REPORT
 WorkOrder:HS19120702
 Lab ID:HS19120702-02
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED	
VOLATILES ORGANICS BY METHOD 8260C		Method:SW8260						Analyst: PC	
Chloromethane	5.0	U	2.0	5.0	10	UG/L	10	16-Dec-2019 17:05	
cis-1,2-Dichloroethene	400		2.0	5.0	10	UG/L	10	16-Dec-2019 17:05	
cis-1,3-Dichloropropene	5.0	U	1.0	5.0	10	UG/L	10	16-Dec-2019 17:05	
Dibromochloromethane	5.0	U	3.0	5.0	10	UG/L	10	16-Dec-2019 17:05	
Dibromomethane	5.0	U	2.0	5.0	10	UG/L	10	16-Dec-2019 17:05	
Dichlorodifluoromethane	5.0	U	3.0	5.0	10	UG/L	10	16-Dec-2019 17:05	
Ethylbenzene	5.0	U	3.0	5.0	10	UG/L	10	16-Dec-2019 17:05	
Hexachlorobutadiene	5.0	U	10	5.0	10	UG/L	10	16-Dec-2019 17:05	
Isopropylbenzene	5.0	U	3.0	5.0	10	UG/L	10	16-Dec-2019 17:05	
m,p-Xylene	10	U	5.0	10	20	UG/L	10	16-Dec-2019 17:05	
Methylene chloride	10	U	4.0	10	20	UG/L	10	16-Dec-2019 17:05	
n-Butylbenzene	5.0	U	4.0	5.0	10	UG/L	10	16-Dec-2019 17:05	
n-Propylbenzene	5.0	U	3.0	5.0	10	UG/L	10	16-Dec-2019 17:05	
Naphthalene	5.0	U	3.0	5.0	10	UG/L	10	16-Dec-2019 17:05	
o-Xylene	5.0	U	3.0	5.0	10	UG/L	10	16-Dec-2019 17:05	
sec-Butylbenzene	5.0	U	3.0	5.0	10	UG/L	10	16-Dec-2019 17:05	
Styrene	5.0	U	3.0	5.0	10	UG/L	10	16-Dec-2019 17:05	
tert-Butylbenzene	5.0	U	3.0	5.0	10	UG/L	10	16-Dec-2019 17:05	
Tetrachloroethene	5.0	U	3.0	5.0	10	UG/L	10	16-Dec-2019 17:05	
Toluene	5.0	U	2.0	5.0	10	UG/L	10	16-Dec-2019 17:05	
trans-1,2-Dichloroethene	5.0	U	2.0	5.0	10	UG/L	10	16-Dec-2019 17:05	
trans-1,3-Dichloropropene	5.0	U	2.0	5.0	10	UG/L	10	16-Dec-2019 17:05	
Trichloroethene	3,200		20	50	100	UG/L	100	16-Dec-2019 19:05	
Trichlorofluoromethane	5.0	U	3.0	5.0	10	UG/L	10	16-Dec-2019 17:05	
Vinyl chloride	8.6	J	2.0	5.0	10	UG/L	10	16-Dec-2019 17:05	
Surr: 1,2-Dichloroethane-d4	90.8			0	81-118	%REC	10	16-Dec-2019 17:05	
Surr: 1,2-Dichloroethane-d4	89.3			0	81-118	%REC	100	16-Dec-2019 19:05	
Surr: 4-Bromofluorobenzene	100			0	85-114	%REC	10	16-Dec-2019 17:05	
Surr: 4-Bromofluorobenzene	101			0	85-114	%REC	100	16-Dec-2019 19:05	
Surr: Dibromofluoromethane	93.0			0	80-119	%REC	10	16-Dec-2019 17:05	
Surr: Dibromofluoromethane	93.2			0	80-119	%REC	100	16-Dec-2019 19:05	
Surr: Toluene-d8	101			0	89-112	%REC	10	16-Dec-2019 17:05	
Surr: Toluene-d8	100			0	89-112	%REC	100	16-Dec-2019 19:05	
SEMIVOLATILES SIM		Method:SW8270SIM				Prep:SW3510 / 17-Dec-2019		Analyst: LG	
1,4-Dioxane	4.4		0.10	0.10	0.10	ug/L	10	23-Dec-2019 15:25	
Surr: 2-Fluorobiphenyl	102			0	40-140	%REC	10	23-Dec-2019 15:25	
Surr: 4-Terphenyl-d14	113			0	40-140	%REC	10	23-Dec-2019 15:25	
Surr: Nitrobenzene-d5	82.9			0	40-140	%REC	10	23-Dec-2019 15:25	

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

ALS Houston, US

Date: 30-Dec-19

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP/Site 18/24
 Sample ID: MW21_121119a
 Collection Date: 11-Dec-2019 08:55

ANALYTICAL REPORT
 WorkOrder:HS19120702
 Lab ID:HS19120702-02
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A			Method:SW6020			Prep:SW3010A / 24-Dec-2019		Analyst: JHD
Aluminum	0.00780	J	0.00180	0.00500	0.0100	mg/L	1	27-Dec-2019 13:41
Antimony	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	27-Dec-2019 13:41
Arsenic	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	27-Dec-2019 13:41
Barium	4.45		0.0380	0.0500	0.100	mg/L	20	27-Dec-2019 15:25
Beryllium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	27-Dec-2019 13:41
Cadmium	0.000542	J	0.000200	0.000500	0.00200	mg/L	1	27-Dec-2019 13:41
Calcium	168		0.0340	0.0500	0.500	mg/L	1	27-Dec-2019 13:41
Chromium	0.223		0.000400	0.000500	0.00500	mg/L	1	27-Dec-2019 13:41
Cobalt	0.0497		0.000100	0.000500	0.00500	mg/L	1	27-Dec-2019 13:41
Copper	0.0361		0.00100	0.00250	0.00500	mg/L	1	27-Dec-2019 13:41
Iron	2.86		0.0120	0.0500	0.200	mg/L	1	27-Dec-2019 13:41
Lead	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	27-Dec-2019 13:41
Magnesium	128		0.0100	0.0500	0.200	mg/L	1	27-Dec-2019 13:41
Manganese	1.60		0.000700	0.00250	0.00500	mg/L	1	27-Dec-2019 13:41
Nickel	0.541		0.000600	0.00100	0.00500	mg/L	1	27-Dec-2019 13:41
Potassium	2.05		0.0180	0.0500	0.200	mg/L	1	27-Dec-2019 13:41
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	27-Dec-2019 13:41
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	27-Dec-2019 13:41
Sodium	455		0.280	1.00	4.00	mg/L	20	27-Dec-2019 15:25
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	27-Dec-2019 13:41
Vanadium	0.00182	J	0.000600	0.00100	0.00500	mg/L	1	27-Dec-2019 13:41
Zinc	0.0181		0.00200	0.00250	0.00500	mg/L	1	27-Dec-2019 13:41
MERCURY BY SW7470A			Method:SW7470			Prep:SW7470 / 24-Dec-2019		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	24-Dec-2019 17:15
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)			Method:NA			Analyst: SUB		
Subcontract Analysis	See Attached		0	0		NA	1	30-Dec-2019 17:31

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

ALS Houston, US

Date: 30-Dec-19

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP/Site 18/24
 Sample ID: MW22_121119
 Collection Date: 11-Dec-2019 10:45

ANALYTICAL REPORT
 WorkOrder:HS19120702
 Lab ID:HS19120702-03
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED	
VOLATILES ORGANICS BY METHOD 8260C		Method:SW8260							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 16:17	
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 16:17	
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	16-Dec-2019 16:17	
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 16:17	
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 16:17	
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 16:17	
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 16:17	
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	16-Dec-2019 16:17	
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	16-Dec-2019 16:17	
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	16-Dec-2019 16:17	
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 16:17	
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 16:17	
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 16:17	
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	16-Dec-2019 16:17	
1,2-Dichloroethane	4.3		0.20	0.50	1.0	UG/L	1	16-Dec-2019 16:17	
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	16-Dec-2019 16:17	
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 16:17	
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	16-Dec-2019 16:17	
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 16:17	
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	16-Dec-2019 16:17	
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 16:17	
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	16-Dec-2019 16:17	
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 16:17	
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	16-Dec-2019 16:17	
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	16-Dec-2019 16:17	
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 16:17	
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	16-Dec-2019 16:17	
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	16-Dec-2019 16:17	
Benzene	0.89	J	0.20	0.50	1.0	UG/L	1	16-Dec-2019 16:17	
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	16-Dec-2019 16:17	
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 16:17	
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 16:17	
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	16-Dec-2019 16:17	
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	16-Dec-2019 16:17	
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	16-Dec-2019 16:17	
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	16-Dec-2019 16:17	
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 16:17	
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 16:17	
Chloroform	2.2		0.20	0.50	1.0	UG/L	1	16-Dec-2019 16:17	

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

ALS Houston, US

Date: 30-Dec-19

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP/Site 18/24
 Sample ID: MW22_121119
 Collection Date: 11-Dec-2019 10:45

ANALYTICAL REPORT
 WorkOrder:HS19120702
 Lab ID:HS19120702-03
 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	16-Dec-2019 16:17	
cis-1,2-Dichloroethene	3.2		0.20	0.50	1.0	UG/L	1	16-Dec-2019 16:17	
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	16-Dec-2019 16:17	
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 16:17	
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 16:17	
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 16:17	
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 16:17	
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	UG/L	1	16-Dec-2019 16:17	
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 16:17	
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	16-Dec-2019 16:17	
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	16-Dec-2019 16:17	
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	16-Dec-2019 16:17	
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 16:17	
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 16:17	
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 16:17	
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 16:17	
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 16:17	
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 16:17	
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 16:17	
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 16:17	
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 16:17	
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 16:17	
Trichloroethene	240		1.0	2.5	5.0	UG/L	5	16-Dec-2019 21:05	
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 16:17	
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 16:17	
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>91.1</i>			0	<i>81-118</i>	%REC	1	16-Dec-2019 16:17	
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>89.3</i>			0	<i>81-118</i>	%REC	5	16-Dec-2019 21:05	
<i>Surr: 4-Bromofluorobenzene</i>	<i>98.6</i>			0	<i>85-114</i>	%REC	1	16-Dec-2019 16:17	
<i>Surr: 4-Bromofluorobenzene</i>	<i>98.0</i>			0	<i>85-114</i>	%REC	5	16-Dec-2019 21:05	
<i>Surr: Dibromofluoromethane</i>	<i>92.9</i>			0	<i>80-119</i>	%REC	1	16-Dec-2019 16:17	
<i>Surr: Dibromofluoromethane</i>	<i>92.1</i>			0	<i>80-119</i>	%REC	5	16-Dec-2019 21:05	
<i>Surr: Toluene-d8</i>	<i>102</i>			0	<i>89-112</i>	%REC	1	16-Dec-2019 16:17	
<i>Surr: Toluene-d8</i>	<i>103</i>			0	<i>89-112</i>	%REC	5	16-Dec-2019 21:05	

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

ALS Houston, US

Date: 30-Dec-19

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP/Site 18/24
 Sample ID: MW22_121119
 Collection Date: 11-Dec-2019 10:45

ANALYTICAL REPORT
 WorkOrder:HS19120702
 Lab ID:HS19120702-03
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A			Method:SW6020			Prep:SW3010A / 24-Dec-2019		Analyst: JHD
Aluminum	0.0245		0.00180	0.00500	0.0100	mg/L	1	27-Dec-2019 14:10
Antimony	0.000693	J	0.000400	0.000500	0.00500	mg/L	1	27-Dec-2019 14:10
Arsenic	0.00130	J	0.000400	0.000500	0.00500	mg/L	1	27-Dec-2019 14:10
Barium	0.897		0.0190	0.0250	0.0500	mg/L	10	27-Dec-2019 16:24
Beryllium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	27-Dec-2019 14:10
Cadmium	0.000500	J	0.000200	0.000500	0.00200	mg/L	1	27-Dec-2019 14:10
Calcium	74.0		0.340	0.500	5.00	mg/L	10	27-Dec-2019 16:24
Chromium	0.520		0.00400	0.00500	0.0500	mg/L	10	27-Dec-2019 16:24
Cobalt	0.0101		0.000100	0.000500	0.00500	mg/L	1	27-Dec-2019 14:10
Copper	0.0109		0.00100	0.00250	0.00500	mg/L	1	27-Dec-2019 14:10
Iron	6.06		0.0120	0.0500	0.200	mg/L	1	27-Dec-2019 14:10
Lead	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	27-Dec-2019 14:10
Magnesium	33.7		0.0100	0.0500	0.200	mg/L	1	27-Dec-2019 14:10
Manganese	0.257		0.000700	0.00250	0.00500	mg/L	1	27-Dec-2019 14:10
Nickel	0.283		0.000600	0.00100	0.00500	mg/L	1	27-Dec-2019 14:10
Potassium	2.07		0.0180	0.0500	0.200	mg/L	1	27-Dec-2019 14:10
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	27-Dec-2019 14:10
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	27-Dec-2019 14:10
Sodium	375		0.140	0.500	2.00	mg/L	10	27-Dec-2019 16:24
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	27-Dec-2019 14:10
Vanadium	0.00337	J	0.000600	0.00100	0.00500	mg/L	1	27-Dec-2019 14:10
Zinc	0.00329	J	0.00200	0.00250	0.00500	mg/L	1	27-Dec-2019 14:10
MERCURY BY SW7470A			Method:SW7470			Prep:SW7470 / 24-Dec-2019		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	24-Dec-2019 17:03
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)			Method:NA			Analyst: SUB		
Subcontract Analysis	See Attached		0	0		NA	1	30-Dec-2019 17:31

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

ALS Houston, US

Date: 30-Dec-19

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP/Site 18/24
 Sample ID: 18CPTMW06_121119
 Collection Date: 11-Dec-2019 12:15

ANALYTICAL REPORT
 WorkOrder:HS19120702
 Lab ID:HS19120702-04
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED	
VOLATILES ORGANICS BY METHOD		Method:SW8260							Analyst: PC
8260C									
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 20:17	
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 20:17	
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	16-Dec-2019 20:17	
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 20:17	
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 20:17	
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 20:17	
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 20:17	
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	16-Dec-2019 20:17	
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	16-Dec-2019 20:17	
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	16-Dec-2019 20:17	
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 20:17	
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 20:17	
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 20:17	
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	16-Dec-2019 20:17	
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 20:17	
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	16-Dec-2019 20:17	
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 20:17	
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	16-Dec-2019 20:17	
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 20:17	
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	16-Dec-2019 20:17	
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 20:17	
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	16-Dec-2019 20:17	
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 20:17	
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	16-Dec-2019 20:17	
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	16-Dec-2019 20:17	
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 20:17	
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	16-Dec-2019 20:17	
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	16-Dec-2019 20:17	
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 20:17	
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	16-Dec-2019 20:17	
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 20:17	
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 20:17	
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	16-Dec-2019 20:17	
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	16-Dec-2019 20:17	
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	16-Dec-2019 20:17	
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	16-Dec-2019 20:17	
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 20:17	
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 20:17	
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 20:17	

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

ALS Houston, US

Date: 30-Dec-19

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP/Site 18/24
 Sample ID: 18CPTMW06_121119
 Collection Date: 11-Dec-2019 12:15

ANALYTICAL REPORT
 WorkOrder:HS19120702
 Lab ID:HS19120702-04
 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	16-Dec-2019 20:17	
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 20:17	
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	16-Dec-2019 20:17	
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 20:17	
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 20:17	
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 20:17	
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 20:17	
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	UG/L	1	16-Dec-2019 20:17	
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 20:17	
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	16-Dec-2019 20:17	
Methylene chloride	1.4	J	0.40	1.0	2.0	UG/L	1	16-Dec-2019 20:17	
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	16-Dec-2019 20:17	
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 20:17	
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 20:17	
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 20:17	
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 20:17	
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 20:17	
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 20:17	
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 20:17	
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 20:17	
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 20:17	
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 20:17	
Trichloroethene	1.3		0.20	0.50	1.0	UG/L	1	16-Dec-2019 20:17	
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 20:17	
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 20:17	
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>90.6</i>			0	<i>81-118</i>	%REC	1	16-Dec-2019 20:17	
<i>Surr: 4-Bromofluorobenzene</i>	<i>99.8</i>			0	<i>85-114</i>	%REC	1	16-Dec-2019 20:17	
<i>Surr: Dibromofluoromethane</i>	<i>94.0</i>			0	<i>80-119</i>	%REC	1	16-Dec-2019 20:17	
<i>Surr: Toluene-d8</i>	<i>100</i>			0	<i>89-112</i>	%REC	1	16-Dec-2019 20:17	
SEMIVOLATILES SIM		Method:SW8270SIM				Prep:SW3510 / 17-Dec-2019		Analyst: LG	
1,4-Dioxane	0.055		0.010	0.010	0.010	ug/L	1	20-Dec-2019 14:37	
<i>Surr: 2-Fluorobiphenyl</i>	<i>96.8</i>			0	<i>40-140</i>	%REC	1	20-Dec-2019 14:37	
<i>Surr: 4-Terphenyl-d14</i>	<i>98.6</i>			0	<i>40-140</i>	%REC	1	20-Dec-2019 14:37	
<i>Surr: Nitrobenzene-d5</i>	<i>85.8</i>			0	<i>40-140</i>	%REC	1	20-Dec-2019 14:37	
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		Method:NA						Analyst: SUB	
Subcontract Analysis	See Attached		0	0		NA	1	30-Dec-2019 17:31	

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

ALS Houston, US

Date: 30-Dec-19

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP/Site 18/24
 Sample ID: 18CPTMW03SW_121119
 Collection Date: 11-Dec-2019 01:33

ANALYTICAL REPORT
 WorkOrder:HS19120702
 Lab ID:HS19120702-05
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD		Method:SW8260						
8260C								Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 20:41
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 20:41
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	16-Dec-2019 20:41
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 20:41
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 20:41
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 20:41
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 20:41
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	16-Dec-2019 20:41
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	16-Dec-2019 20:41
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	16-Dec-2019 20:41
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 20:41
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 20:41
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 20:41
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	16-Dec-2019 20:41
1,2-Dichloroethane	1.2		0.20	0.50	1.0	UG/L	1	16-Dec-2019 20:41
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	16-Dec-2019 20:41
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 20:41
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	16-Dec-2019 20:41
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 20:41
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	16-Dec-2019 20:41
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 20:41
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	16-Dec-2019 20:41
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 20:41
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	16-Dec-2019 20:41
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	16-Dec-2019 20:41
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 20:41
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	16-Dec-2019 20:41
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	16-Dec-2019 20:41
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 20:41
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	16-Dec-2019 20:41
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 20:41
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 20:41
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	16-Dec-2019 20:41
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	16-Dec-2019 20:41
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	16-Dec-2019 20:41
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	16-Dec-2019 20:41
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 20:41
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 20:41
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 20:41

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

ALS Houston, US

Date: 30-Dec-19

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP/Site 18/24
 Sample ID: 18CPTMW03SW_121119
 Collection Date: 11-Dec-2019 01:33

ANALYTICAL REPORT
 WorkOrder:HS19120702
 Lab ID:HS19120702-05
 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	16-Dec-2019 20:41	
cis-1,2-Dichloroethene	2.0		0.20	0.50	1.0	UG/L	1	16-Dec-2019 20:41	
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	16-Dec-2019 20:41	
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 20:41	
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 20:41	
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 20:41	
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 20:41	
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	UG/L	1	16-Dec-2019 20:41	
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 20:41	
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	16-Dec-2019 20:41	
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	16-Dec-2019 20:41	
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	16-Dec-2019 20:41	
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 20:41	
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 20:41	
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 20:41	
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 20:41	
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 20:41	
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 20:41	
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 20:41	
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 20:41	
trans-1,2-Dichloroethene	0.66	J	0.20	0.50	1.0	UG/L	1	16-Dec-2019 20:41	
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 20:41	
Trichloroethene	13		0.20	0.50	1.0	UG/L	1	16-Dec-2019 20:41	
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 20:41	
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 20:41	
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>90.3</i>			0	<i>81-118</i>	%REC	<i>1</i>	<i>16-Dec-2019 20:41</i>	
<i>Surr: 4-Bromofluorobenzene</i>	<i>99.6</i>			0	<i>85-114</i>	%REC	<i>1</i>	<i>16-Dec-2019 20:41</i>	
<i>Surr: Dibromofluoromethane</i>	<i>92.2</i>			0	<i>80-119</i>	%REC	<i>1</i>	<i>16-Dec-2019 20:41</i>	
<i>Surr: Toluene-d8</i>	<i>102</i>			0	<i>89-112</i>	%REC	<i>1</i>	<i>16-Dec-2019 20:41</i>	
SEMIVOLATILES SIM		Method:SW8270SIM						Prep:SW3510 / 17-Dec-2019 Analyst: LG	
1,4-Dioxane	2.3		0.10	0.10	0.10	ug/L	10	23-Dec-2019 15:44	
<i>Surr: 2-Fluorobiphenyl</i>	<i>117</i>			0	<i>40-140</i>	%REC	<i>10</i>	<i>23-Dec-2019 15:44</i>	
<i>Surr: 4-Terphenyl-d14</i>	<i>116</i>			0	<i>40-140</i>	%REC	<i>10</i>	<i>23-Dec-2019 15:44</i>	
<i>Surr: Nitrobenzene-d5</i>	<i>126</i>			0	<i>40-140</i>	%REC	<i>10</i>	<i>23-Dec-2019 15:44</i>	

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

ALS Houston, US

Date: 30-Dec-19

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP/Site 18/24
 Sample ID: 18CPTMW03SW_121119
 Collection Date: 11-Dec-2019 01:33

ANALYTICAL REPORT
 WorkOrder:HS19120702
 Lab ID:HS19120702-05
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A		Method:SW6020				Prep:SW3010A / 24-Dec-2019		Analyst: JHD
Aluminum	0.0241		0.00180	0.00500	0.0100	mg/L	1	27-Dec-2019 14:26
Antimony	0.000691	J	0.000400	0.000500	0.00500	mg/L	1	27-Dec-2019 14:26
Arsenic	0.00162	J	0.000400	0.000500	0.00500	mg/L	1	27-Dec-2019 14:26
Barium	0.156		0.00190	0.00250	0.00500	mg/L	1	27-Dec-2019 14:26
Beryllium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	27-Dec-2019 14:26
Cadmium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	27-Dec-2019 14:26
Calcium	14.0		0.0340	0.0500	0.500	mg/L	1	27-Dec-2019 14:26
Chromium	0.0174		0.000400	0.000500	0.00500	mg/L	1	27-Dec-2019 14:26
Cobalt	0.00235	J	0.000100	0.000500	0.00500	mg/L	1	27-Dec-2019 14:26
Copper	0.00250	U	0.00100	0.00250	0.00500	mg/L	1	27-Dec-2019 14:26
Iron	0.477		0.0120	0.0500	0.200	mg/L	1	27-Dec-2019 14:26
Lead	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	27-Dec-2019 14:26
Magnesium	9.84		0.0100	0.0500	0.200	mg/L	1	27-Dec-2019 14:26
Manganese	0.0209		0.000700	0.00250	0.00500	mg/L	1	27-Dec-2019 14:26
Nickel	0.00808		0.000600	0.00100	0.00500	mg/L	1	27-Dec-2019 14:26
Potassium	234		0.360	1.00	4.00	mg/L	20	27-Dec-2019 15:27
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	27-Dec-2019 14:26
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	27-Dec-2019 14:26
Sodium	278		0.280	1.00	4.00	mg/L	20	27-Dec-2019 15:27
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	27-Dec-2019 14:26
Vanadium	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	27-Dec-2019 14:26
Zinc	0.00605		0.00200	0.00250	0.00500	mg/L	1	27-Dec-2019 14:26
MERCURY BY SW7470A		Method:SW7470				Prep:SW7470 / 24-Dec-2019		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	24-Dec-2019 17:21
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		Method:NA						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	30-Dec-2019 17:31

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

ALS Houston, US

Date: 30-Dec-19

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP/Site 18/24
 Sample ID: Trip Blank
 Collection Date: 11-Dec-2019 00:00

ANALYTICAL REPORT
 WorkOrder:HS19120702
 Lab ID:HS19120702-06
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD		Method:SW8260						
8260C								Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 19:53
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 19:53
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	16-Dec-2019 19:53
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 19:53
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 19:53
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 19:53
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 19:53
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	16-Dec-2019 19:53
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	16-Dec-2019 19:53
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	16-Dec-2019 19:53
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 19:53
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 19:53
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 19:53
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	16-Dec-2019 19:53
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 19:53
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	16-Dec-2019 19:53
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 19:53
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	16-Dec-2019 19:53
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 19:53
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	16-Dec-2019 19:53
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 19:53
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	16-Dec-2019 19:53
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 19:53
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	16-Dec-2019 19:53
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	16-Dec-2019 19:53
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 19:53
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	16-Dec-2019 19:53
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	16-Dec-2019 19:53
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 19:53
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	16-Dec-2019 19:53
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 19:53
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 19:53
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	16-Dec-2019 19:53
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	16-Dec-2019 19:53
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	16-Dec-2019 19:53
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	16-Dec-2019 19:53
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 19:53
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 19:53
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 19:53

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

ALS Houston, US

Date: 30-Dec-19

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP/Site 18/24
 Sample ID: Trip Blank
 Collection Date: 11-Dec-2019 00:00

ANALYTICAL REPORT
 WorkOrder:HS19120702
 Lab ID:HS19120702-06
 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	16-Dec-2019 19:53	
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 19:53	
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	16-Dec-2019 19:53	
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 19:53	
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 19:53	
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 19:53	
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 19:53	
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	UG/L	1	16-Dec-2019 19:53	
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 19:53	
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	16-Dec-2019 19:53	
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	16-Dec-2019 19:53	
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	16-Dec-2019 19:53	
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 19:53	
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 19:53	
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 19:53	
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 19:53	
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 19:53	
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 19:53	
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 19:53	
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 19:53	
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 19:53	
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 19:53	
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 19:53	
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	16-Dec-2019 19:53	
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	16-Dec-2019 19:53	
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>89.1</i>			0	<i>81-118</i>	<i>%REC</i>	<i>1</i>	<i>16-Dec-2019 19:53</i>	
<i>Surr: 4-Bromofluorobenzene</i>	<i>98.7</i>			0	<i>85-114</i>	<i>%REC</i>	<i>1</i>	<i>16-Dec-2019 19:53</i>	
<i>Surr: Dibromofluoromethane</i>	<i>92.9</i>			0	<i>80-119</i>	<i>%REC</i>	<i>1</i>	<i>16-Dec-2019 19:53</i>	
<i>Surr: Toluene-d8</i>	<i>102</i>			0	<i>89-112</i>	<i>%REC</i>	<i>1</i>	<i>16-Dec-2019 19:53</i>	

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

Weight / Prep Log

Client: Bhate Environmental Associates, Inc.
Project: LHAAP/Site 18/24
WorkOrder: HS19120702

Batch ID: 148814 **Start Date:** 17 Dec 2019 07:00 **End Date:** 17 Dec 2019 15:00
Method: SV AQ SEP FUN EXTRACT-LOWLEV - 3510C **Prep Code:** 3510_B_SIM

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19120702-01	1	1000 (mL)	1 (mL)	0.001
HS19120702-02	1	1000 (mL)	1 (mL)	0.001
HS19120702-04	1	1000 (mL)	1 (mL)	0.001
HS19120702-05	1	1000 (mL)	1 (mL)	0.001

Batch ID: 149099 **Start Date:** 24 Dec 2019 10:30 **End Date:** 24 Dec 2019 12:30
Method: MERCURY PREP BY 7470A- WATER **Prep Code:** HG_WPR

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19120702-01		10 (mL)	10 (mL)	1
HS19120702-02		10 (mL)	10 (mL)	1
HS19120702-03		10 (mL)	10 (mL)	1
HS19120702-05		10 (mL)	10 (mL)	1

Batch ID: 149105 **Start Date:** 24 Dec 2019 12:00 **End Date:** 24 Dec 2019 16:00
Method: WATER - SW3010A **Prep Code:** 3010A

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19120702-01		10 (mL)	10 (mL)	1
HS19120702-02		10 (mL)	10 (mL)	1
HS19120702-03		10 (mL)	10 (mL)	1
HS19120702-05		10 (mL)	10 (mL)	1

ALS Houston, US

Date: 30-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP/Site 18/24
WorkOrder: HS19120702

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: 148814 (1)		Test Name : SEMIVOLATILES SIM			Matrix: Groundwater	
HS19120702-01	MW21_121119	11 Dec 2019 08:55		17 Dec 2019 07:00	23 Dec 2019 15:05	10
HS19120702-02	MW21_121119a	11 Dec 2019 08:55		17 Dec 2019 07:00	23 Dec 2019 15:25	10
HS19120702-04	18CPTMW06_121119	11 Dec 2019 12:15		17 Dec 2019 07:00	20 Dec 2019 14:37	1
HS19120702-05	18CPTMW03SW_121119	11 Dec 2019 01:33		17 Dec 2019 07:00	23 Dec 2019 15:44	10
Batch ID: 149099 (0)		Test Name : MERCURY BY SW7470A			Matrix: Groundwater	
HS19120702-01	MW21_121119	11 Dec 2019 08:55		24 Dec 2019 10:30	24 Dec 2019 17:14	1
HS19120702-02	MW21_121119a	11 Dec 2019 08:55		24 Dec 2019 10:30	24 Dec 2019 17:15	1
HS19120702-03	MW22_121119	11 Dec 2019 10:45		24 Dec 2019 10:30	24 Dec 2019 17:03	1
HS19120702-05	18CPTMW03SW_121119	11 Dec 2019 01:33		24 Dec 2019 10:30	24 Dec 2019 17:21	1
Batch ID: 149105 (0)		Test Name : METALS BY ICPMS BY SW6020A			Matrix: Groundwater	
HS19120702-01	MW21_121119	11 Dec 2019 08:55		24 Dec 2019 16:00	27 Dec 2019 15:16	20
HS19120702-01	MW21_121119	11 Dec 2019 08:55		24 Dec 2019 16:00	27 Dec 2019 13:39	1
HS19120702-02	MW21_121119a	11 Dec 2019 08:55		24 Dec 2019 16:00	27 Dec 2019 15:25	20
HS19120702-02	MW21_121119a	11 Dec 2019 08:55		24 Dec 2019 16:00	27 Dec 2019 13:41	1
HS19120702-03	MW22_121119	11 Dec 2019 10:45		24 Dec 2019 16:00	27 Dec 2019 16:24	10
HS19120702-03	MW22_121119	11 Dec 2019 10:45		24 Dec 2019 16:00	27 Dec 2019 14:10	1
HS19120702-05	18CPTMW03SW_121119	11 Dec 2019 01:33		24 Dec 2019 16:00	27 Dec 2019 15:27	20
HS19120702-05	18CPTMW03SW_121119	11 Dec 2019 01:33		24 Dec 2019 16:00	27 Dec 2019 14:26	1
Batch ID: R352668 (0)		Test Name : VOLATILES ORGANICS BY METHOD 8260C			Matrix: Groundwater	
HS19120702-01	MW21_121119	11 Dec 2019 08:55			16 Dec 2019 18:17	100
HS19120702-01	MW21_121119	11 Dec 2019 08:55			16 Dec 2019 16:41	10
HS19120702-02	MW21_121119a	11 Dec 2019 08:55			16 Dec 2019 19:05	100
HS19120702-02	MW21_121119a	11 Dec 2019 08:55			16 Dec 2019 17:05	10
HS19120702-03	MW22_121119	11 Dec 2019 10:45			16 Dec 2019 21:05	5
HS19120702-03	MW22_121119	11 Dec 2019 10:45			16 Dec 2019 16:17	1
HS19120702-04	18CPTMW06_121119	11 Dec 2019 12:15			16 Dec 2019 20:17	1
HS19120702-05	18CPTMW03SW_121119	11 Dec 2019 01:33			16 Dec 2019 20:41	1
HS19120702-06	Trip Blank	11 Dec 2019 00:00			16 Dec 2019 19:53	1
Batch ID: R353541 (0)		Test Name : SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)			Matrix: Groundwater	
HS19120702-01	MW21_121119	11 Dec 2019 08:55			30 Dec 2019 17:31	1
HS19120702-02	MW21_121119a	11 Dec 2019 08:55			30 Dec 2019 17:31	1
HS19120702-03	MW22_121119	11 Dec 2019 10:45			30 Dec 2019 17:31	1
HS19120702-04	18CPTMW06_121119	11 Dec 2019 12:15			30 Dec 2019 17:31	1
HS19120702-05	18CPTMW03SW_121119	11 Dec 2019 01:33			30 Dec 2019 17:31	1

ALS Houston, US

Date: 30-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP/Site 18/24
WorkOrder: HS19120702

QC BATCH REPORT

Batch ID: 149099 (0)		Instrument: HG03		Method: MERCURY BY SW7470A						
MBLK	Sample ID: MBLK-149099	Units: mg/L		Analysis Date: 24-Dec-2019 17:00						
Client ID:		Run ID: HG03_353245	SeqNo: 5408656	PrepDate: 24-Dec-2019	DF: 1					
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual	
Mercury	0.000100	0.000200							U	
LCS	Sample ID: LCS-149099	Units: mg/L		Analysis Date: 24-Dec-2019 17:02						
Client ID:		Run ID: HG03_353245	SeqNo: 5408657	PrepDate: 24-Dec-2019	DF: 1					
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual	
Mercury	0.00500	0.000200	0.005	0	100	82 - 119				
MS	Sample ID: HS19120702-03MS	Units: mg/L		Analysis Date: 24-Dec-2019 17:05						
Client ID: MW22_121119		Run ID: HG03_353245	SeqNo: 5408659	PrepDate: 24-Dec-2019	DF: 1					
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual	
Mercury	0.00495	0.000200	0.005	-0.000005000	99.1	82 - 119				
MSD	Sample ID: HS19120702-03MSD	Units: mg/L		Analysis Date: 24-Dec-2019 17:07						
Client ID: MW22_121119		Run ID: HG03_353245	SeqNo: 5408660	PrepDate: 24-Dec-2019	DF: 1					
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual	
Mercury	0.00505	0.000200	0.005	-0.000005000	101	82 - 119	0.004950	2	20	
The following samples were analyzed in this batch:										
		HS19120702-01	HS19120702-02	HS19120702-03	HS19120702-05					

ALS Houston, US

Date: 30-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP/Site 18/24
WorkOrder: HS19120702

QC BATCH REPORT

Batch ID: 149105 (0)		Instrument: ICPMS05		Method: METALS BY ICPMS BY SW6020A						
MBLK	Sample ID: MBLK-149105	Units: mg/L			Analysis Date: 27-Dec-2019 13:25					
Client ID:	Run ID: ICPMS05_353383	SeqNo: 5412799	PrepDate: 24-Dec-2019	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.004238	0.0100								J
Antimony	0.000500	0.00500								U
Arsenic	0.000500	0.00500								U
Barium	0.00250	0.00500								U
Beryllium	0.000500	0.00200								U
Cadmium	0.000500	0.00200								U
Calcium	0.05506	0.500								J
Chromium	0.000500	0.00500								U
Cobalt	0.000500	0.00500								U
Copper	0.00250	0.00500								U
Iron	0.1659	0.200								J
Lead	0.00100	0.00500								U
Magnesium	0.0500	0.200								U
Manganese	0.000962	0.00500								J
Nickel	0.00100	0.00500								U
Potassium	0.0500	0.200								U
Selenium	0.00250	0.00500								U
Silver	0.000500	0.00500								U
Sodium	0.0500	0.200								U
Thallium	0.000500	0.00200								U
Vanadium	0.00100	0.00500								U
Zinc	0.00250	0.00500								U

ALS Houston, US

Date: 30-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP/Site 18/24
WorkOrder: HS19120702

QC BATCH REPORT

Batch ID: 149105 (0)		Instrument: ICPMS05		Method: METALS BY ICPMS BY SW6020A						
LCS	Sample ID: LCS-149105	Units: mg/L			Analysis Date: 27-Dec-2019 14:33					
Client ID:	Run ID: ICPMS05_353383	SeqNo: 5412820	PrepDate: 24-Dec-2019	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.09227	0.0100	0.1	0	92.3	84 - 117				
Antimony	0.05171	0.00500	0.05	0	103	85 - 117				
Arsenic	0.05071	0.00500	0.05	0	101	84 - 116				
Barium	0.04742	0.00500	0.05	0	94.8	86 - 114				
Beryllium	0.04757	0.00200	0.05	0	95.1	83 - 121				
Cadmium	0.04941	0.00200	0.05	0	98.8	87 - 115				
Calcium	5.231	0.500	5	0	105	87 - 118				
Chromium	0.04905	0.00500	0.05	0	98.1	85 - 116				
Cobalt	0.04929	0.00500	0.05	0	98.6	86 - 115				
Copper	0.04986	0.00500	0.05	0	99.7	85 - 118				
Iron	5.023	0.200	5	0	100	87 - 118				
Lead	0.04781	0.00500	0.05	0	95.6	88 - 115				
Magnesium	5.31	0.200	5	0	106	83 - 118				
Manganese	0.04872	0.00500	0.05	0	97.4	87 - 115				
Nickel	0.05058	0.00500	0.05	0	101	85 - 117				
Potassium	5.146	0.200	5	0	103	87 - 115				
Selenium	0.0501	0.00500	0.05	0	100	80 - 120				
Silver	0.04799	0.00500	0.05	0	96.0	85 - 116				
Sodium	5.351	0.200	5	0	107	85 - 117				
Thallium	0.04462	0.00200	0.05	0	89.2	82 - 116				
Vanadium	0.04983	0.00500	0.05	0	99.7	86 - 115				
Zinc	0.05178	0.00500	0.05	0	104	83 - 119				

ALS Houston, US

Date: 30-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP/Site 18/24
WorkOrder: HS19120702

QC BATCH REPORT

Batch ID: 149105 (0)		Instrument: ICPMS05		Method: METALS BY ICPMS BY SW6020A						
MS	Sample ID: HS19120702-03MS	Units: mg/L			Analysis Date: 27-Dec-2019 16:20					
Client ID: MW22_121119	Run ID: ICPMS05_353383	SeqNo: 5412902	PrepDate: 24-Dec-2019	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.1096	0.0100	0.1	0.02447	85.2	84 - 117				
Antimony	0.05121	0.00500	0.05	0.000693	101	85 - 117				
Arsenic	0.05093	0.00500	0.05	0.0013	99.3	84 - 116				
Barium	0.9021	0.00500	0.05	1.115	-425	86 - 114				SO
Cadmium	0.04632	0.00200	0.05	0.0005	91.6	87 - 115				
Calcium	72.84	0.500	5	90.85	-360	87 - 118				SO
Chromium	0.5436	0.00500	0.05	0.6401	-193	85 - 116				SO
Cobalt	0.05631	0.00500	0.05	0.01007	92.5	86 - 115				
Copper	0.0567	0.00500	0.05	0.0109	91.6	85 - 118				
Lead	0.04614	0.00500	0.05	0	92.3	88 - 115				
Magnesium	31.35	0.200	5	33.71	-47.2	83 - 118				SO
Manganese	0.2371	0.00500	0.05	0.2568	-39.2	87 - 115				SO
Nickel	0.2751	0.00500	0.05	0.2826	-15.1	85 - 117				SO
Potassium	6.969	0.200	5	2.068	98.0	87 - 115				
Selenium	0.0481	0.00500	0.05	0	96.2	80 - 120				
Silver	0.04409	0.00500	0.05	0	88.2	85 - 116				
Sodium	353.2	0.200	5	417.6	-1290	85 - 117				SEO
Thallium	0.04258	0.00200	0.05	0	85.2	82 - 116				
Vanadium	0.05168	0.00500	0.05	0.003369	96.6	86 - 115				
Zinc	0.0596	0.00500	0.05	0.003288	113	83 - 119				

MS	Sample ID: HS19120702-03MS	Units: mg/L			Analysis Date: 27-Dec-2019 14:14					
Client ID: MW22_121119	Run ID: ICPMS05_353383	SeqNo: 5412813	PrepDate: 24-Dec-2019	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	0.05441	0.00200	0.05	-0.000001	109	83 - 121				
Iron	11.63	0.200	5	6.062	111	87 - 118				

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Date: 30-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP/Site 18/24
WorkOrder: HS19120702

QC BATCH REPORT

Batch ID: 149105 (0)		Instrument: ICPMS05		Method: METALS BY ICPMS BY SW6020A						
MSD	Sample ID: HS19120702-03MSD	Units: mg/L			Analysis Date: 27-Dec-2019 14:16					
Client ID: MW22_121119	Run ID: ICPMS05_353383	SeqNo: 5412814	PrepDate: 24-Dec-2019	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.131	0.0100	0.1	0.02447	107	84 - 117	0.1248	4.86	20	
Beryllium	0.05487	0.00200	0.05	-0.000001	110	83 - 121	0.05441	0.831	20	
Iron	11.43	0.200	5	6.062	107	87 - 118	11.63	1.74	20	
MSD	Sample ID: HS19120702-03MSD	Units: mg/L			Analysis Date: 27-Dec-2019 16:22					
Client ID: MW22_121119	Run ID: ICPMS05_353383	SeqNo: 5412903	PrepDate: 24-Dec-2019	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05219	0.00500	0.05	0.000693	103	85 - 117	0.05121	1.88	20	
Arsenic	0.0529	0.00500	0.05	0.0013	103	84 - 116	0.05093	3.8	20	
Barium	0.99	0.00500	0.05	1.115	-249	86 - 114	0.9021	9.3	20	SO
Cadmium	0.04901	0.00200	0.05	0.0005	97.0	87 - 115	0.04632	5.64	20	
Calcium	74.37	0.500	5	90.85	-330	87 - 118	72.84	2.07	20	SO
Chromium	0.5638	0.00500	0.05	0.6401	-153	85 - 116	0.5436	3.64	20	SO
Cobalt	0.05778	0.00500	0.05	0.01007	95.4	86 - 115	0.05631	2.58	20	
Copper	0.05693	0.00500	0.05	0.0109	92.0	85 - 118	0.0567	0.403	20	
Lead	0.04959	0.00500	0.05	0	99.2	88 - 115	0.04614	7.2	20	
Magnesium	32.11	0.200	5	33.71	-32.1	83 - 118	31.35	2.39	20	SO
Manganese	0.2455	0.00500	0.05	0.2568	-22.6	87 - 115	0.2371	3.46	20	SO
Nickel	0.2784	0.00500	0.05	0.2826	-8.52	85 - 117	0.2751	1.19	20	SO
Potassium	6.782	0.200	5	2.068	94.3	87 - 115	6.969	2.72	20	
Selenium	0.04645	0.00500	0.05	0	92.9	80 - 120	0.0481	3.5	20	
Silver	0.04697	0.00500	0.05	0	93.9	85 - 116	0.04409	6.33	20	
Sodium	355.3	0.200	5	417.6	-1250	85 - 117	353.2	0.58	20	SEO
Thallium	0.04625	0.00200	0.05	0	92.5	82 - 116	0.04258	8.27	20	
Vanadium	0.0527	0.00500	0.05	0.003369	98.7	86 - 115	0.05168	1.95	20	
Zinc	0.05108	0.00500	0.05	0.003288	95.6	83 - 119	0.0596	15.4	20	

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Date: 30-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP/Site 18/24
WorkOrder: HS19120702

QC BATCH REPORT

Batch ID: 149105 (0)		Instrument: ICPMS05		Method: METALS BY ICPMS BY SW6020A						
PDS		Sample ID: HS19120702-03PDS		Units: mg/L		Analysis Date: 27-Dec-2019 14:19				
Client ID: MW22_121119		Run ID: ICPMS05_353383		SeqNo: 5412815		PrepDate: 24-Dec-2019		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
Antimony	0.08256	0.00500	0.1	0.000693	81.9	80 - 120				
Arsenic	0.0932	0.00500	0.1	0.0013	91.9	80 - 120				
Barium	1.135	0.00500	0.1	1.115	20.3	80 - 120			SO	
Cadmium	0.08881	0.00200	0.1	0.0005	88.3	80 - 120				
Calcium	94.39	0.500	10	90.85	35.5	80 - 120			SO	
Chromium	0.6802	0.00500	0.1	0.6401	40.2	80 - 120			SO	
Cobalt	0.09637	0.00500	0.1	0.01007	86.3	80 - 120				
Copper	0.09484	0.00500	0.1	0.0109	83.9	80 - 120				
Iron	14.45	0.200	10	6.062	83.8	80 - 120				
Lead	0.08693	0.00500	0.1	0.00013	86.8	80 - 120				
Potassium	10.8	0.200	10	2.068	87.3	80 - 120				
Selenium	0.086	0.00500	0.1	0.00011	85.9	80 - 120				
Silver	0.08364	0.00500	0.1	0.000013	83.6	80 - 120				
Thallium	0.08765	0.00200	0.1	0.000014	87.6	80 - 120				
Vanadium	0.09222	0.00500	0.1	0.003369	88.8	80 - 120				
Zinc	0.09081	0.00500	0.1	0.003288	87.5	80 - 120				
PDS		Sample ID: HS19120702-03PDS		Units: mg/L		Analysis Date: 27-Dec-2019 16:29				
Client ID: MW22_121119		Run ID: ICPMS05_353383		SeqNo: 5412906		PrepDate: 24-Dec-2019		DF: 10		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
Barium	1.989	0.0500	1	0.8967	109	80 - 120				
Calcium	179.2	5.00	100	74.05	105	80 - 120				
Chromium	1.633	0.0500	1	0.52	111	80 - 120				
Sodium	495.9	2.00	100	375.2	121	80 - 120			S	

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Date: 30-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP/Site 18/24
WorkOrder: HS19120702

QC BATCH REPORT

Batch ID: 149105 (0)		Instrument: ICPMS05		Method: METALS BY ICPMS BY SW6020A						
SD	Sample ID: HS19120702-03SD	Units: mg/L			Analysis Date: 27-Dec-2019 14:12					
Client ID: MW22_121119	Run ID: ICPMS05_353383	SeqNo: 5412812	PrepDate: 24-Dec-2019	DF: 5						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit Qual	
Aluminum	0.01228	0.0500					0.02447	0 10	J	
Antimony	0.00250	0.0250					0.000693	0 10	U	
Arsenic	0.00250	0.0250					0.0013	0 10	U	
Beryllium	0.00250	0.0100					-0.000001	0 10	U	
Cadmium	0.00250	0.0100					0.0005	0 10	U	
Cobalt	0.009437	0.0250					0.01007	0 10	J	
Copper	0.01067	0.0250					0.0109	0 10	J	
Iron	5.55	1.00					6.062	8.46 10		
Lead	0.00500	0.0250					0.00013	0 10	U	
Magnesium	31.48	1.00					33.71	6.62 10		
Manganese	0.2333	0.0250					0.2568	9.15 10		
Nickel	0.2685	0.0250					0.2826	4.99 10		
Potassium	1.943	1.00					2.068	6.03 10		
Selenium	0.0125	0.0250					0.00011	0 10	U	
Silver	0.00250	0.0250					0.000013	0 10	U	
Sodium	396.1	1.00					417.6	5.15 10		
Thallium	0.00250	0.0100					0.000014	0 10	U	
Vanadium	0.005733	0.0250					0.003369	0 10	J	
Zinc	0.0125	0.0250					0.003288	0 10	U	

SD	Sample ID: HS19120702-03SD	Units: mg/L			Analysis Date: 27-Dec-2019 16:26				
Client ID: MW22_121119	Run ID: ICPMS05_353383	SeqNo: 5412905	PrepDate: 24-Dec-2019	DF: 50					
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit Qual
Barium	0.9191	0.250					0.8967	2.49 10	
Calcium	72.7	25.0					74.05	1.82 10	
Chromium	0.5425	0.250					0.52	4.32 10	
Sodium	379.9	10.0					375.2	1.26 10	

The following samples were analyzed in this batch: HS19120702-01 HS19120702-02 HS19120702-03 HS19120702-05

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Date: 30-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP/Site 18/24
WorkOrder: HS19120702

QC BATCH REPORT

Batch ID: 148814 (1)		Instrument: SV-6		Method: SEMIVOLATILES SIM						
MBLK	Sample ID: MBLK-148814	Units: ug/L			Analysis Date: 20-Dec-2019 08:55					
Client ID:	Run ID: SV-6_352996	SeqNo: 5406171		PrepDate: 17-Dec-2019		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
1,4-Dioxane	0.010	0.010							U	
Surr: 2-Fluorobiphenyl	0.09654	0	0.08	0	121	40 - 140				
Surr: 4-Terphenyl-d14	0.09022	0	0.08	0	113	40 - 140				
Surr: Nitrobenzene-d5	0.08627	0	0.08	0	108	40 - 140				
LCS	Sample ID: LCS1-148814	Units: ug/L			Analysis Date: 20-Dec-2019 09:14					
Client ID:	Run ID: SV-6_352996	SeqNo: 5406172		PrepDate: 17-Dec-2019		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
1,4-Dioxane	0.1101	0.010	0.08	0	138	40 - 140				
Surr: 2-Fluorobiphenyl	0.09483	0	0.08	0	119	40 - 140				
Surr: 4-Terphenyl-d14	0.07915	0	0.08	0	98.9	40 - 140				
Surr: Nitrobenzene-d5	0.07534	0	0.08	0	94.2	40 - 140				
LCSD	Sample ID: LCSD1-148814	Units: ug/L			Analysis Date: 20-Dec-2019 09:33					
Client ID:	Run ID: SV-6_352996	SeqNo: 5406173		PrepDate: 17-Dec-2019		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
1,4-Dioxane	0.1039	0.010	0.08	0	130	40 - 140	0.1101	5.76	20	
Surr: 2-Fluorobiphenyl	0.07777	0	0.08	0	97.2	40 - 140	0.09483	19.8	20	
Surr: 4-Terphenyl-d14	0.07343	0	0.08	0	91.8	40 - 140	0.07915	7.49	20	
Surr: Nitrobenzene-d5	0.0755	0	0.08	0	94.4	40 - 140	0.07534	0.209	20	
The following samples were analyzed in this batch:										
HS19120702-01		HS19120702-02		HS19120702-04		HS19120702-05				

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Date: 30-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP/Site 18/24
WorkOrder: HS19120702

QC BATCH REPORT

Batch ID: R352668 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MBLK	Sample ID: VBLKW-191216	Units: UG/L			Analysis Date: 16-Dec-2019 12:40					
Client ID:	Run ID: VOA6_352668	SeqNo: 5394312	PrepDate:	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	0.50	1.0								U
1,1,1-Trichloroethane	0.50	1.0								U
1,1,2,2-Tetrachloroethane	0.50	1.0								U
1,1,2-Trichloroethane	0.50	1.0								U
1,1-Dichloroethane	0.50	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,1-Dichloropropene	0.50	1.0								U
1,2,3-Trichlorobenzene	0.50	1.0								U
1,2,3-Trichloropropane	0.50	1.0								U
1,2,4-Trichlorobenzene	0.50	1.0								U
1,2,4-Trimethylbenzene	0.50	1.0								U
1,2-Dibromo-3-chloropropane	0.50	1.0								U
1,2-Dibromoethane	0.50	1.0								U
1,2-Dichlorobenzene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
1,2-Dichloropropane	0.50	1.0								U
1,3,5-Trimethylbenzene	0.50	1.0								U
1,3-Dichlorobenzene	0.50	1.0								U
1,3-Dichloropropane	0.50	1.0								U
1,4-Dichlorobenzene	0.50	1.0								U
2,2-Dichloropropane	0.50	1.0								U
2-Butanone	1.0	2.0								U
2-Chlorotoluene	0.50	1.0								U
2-Hexanone	1.0	2.0								U
4-Chlorotoluene	0.50	1.0								U
4-Isopropyltoluene	0.50	1.0								U
4-Methyl-2-pentanone	1.0	2.0								U
Acetone	1.0	2.0								U
Benzene	0.50	1.0								U
Bromobenzene	0.50	1.0								U
Bromochloromethane	0.50	1.0								U
Bromodichloromethane	0.50	1.0								U
Bromoform	0.50	1.0								U
Bromomethane	0.50	1.0								U

ALS Houston, US

Date: 30-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP/Site 18/24
WorkOrder: HS19120702

QC BATCH REPORT

Batch ID: R352668 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MBLK	Sample ID: VBLKW-191216	Units: UG/L			Analysis Date: 16-Dec-2019 12:40					
Client ID:	Run ID: VOA6_352668	SeqNo: 5394312	PrepDate:	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	1.0	2.0								U
Carbon tetrachloride	0.50	1.0								U
Chlorobenzene	0.50	1.0								U
Chloroethane	0.50	1.0								U
Chloroform	0.50	1.0								U
Chloromethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
cis-1,3-Dichloropropene	0.50	1.0								U
Dibromochloromethane	0.50	1.0								U
Dibromomethane	0.50	1.0								U
Dichlorodifluoromethane	0.50	1.0								U
Ethylbenzene	0.50	1.0								U
Hexachlorobutadiene	0.50	1.0								U
Isopropylbenzene	0.50	1.0								U
m,p-Xylene	1.0	2.0								U
Methylene chloride	1.0	2.0								U
Naphthalene	0.50	1.0								U
n-Butylbenzene	0.50	1.0								U
n-Propylbenzene	0.50	1.0								U
o-Xylene	0.50	1.0								U
sec-Butylbenzene	0.50	1.0								U
Styrene	0.50	1.0								U
tert-Butylbenzene	0.50	1.0								U
Tetrachloroethene	0.50	1.0								U
Toluene	0.50	1.0								U
trans-1,2-Dichloroethene	0.50	1.0								U
trans-1,3-Dichloropropene	0.50	1.0								U
Trichloroethene	0.50	1.0								U
Trichlorofluoromethane	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	44.44	1.0	50	0	88.9	81 - 118				
Surr: 4-Bromofluorobenzene	48.93	1.0	50	0	97.9	85 - 114				
Surr: Dibromofluoromethane	46	1.0	50	0	92.0	80 - 119				
Surr: Toluene-d8	51.88	1.0	50	0	104	89 - 112				

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Date: 30-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP/Site 18/24
WorkOrder: HS19120702

QC BATCH REPORT

Batch ID: R352668 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
LCS	Sample ID: VLCSW-191216	Units: UG/L			Analysis Date: 16-Dec-2019 11:52					
Client ID:	Run ID: VOA6_352668	SeqNo: 5394311	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	18.75	1.0	20	0	93.7	78 - 124				
1,1,1-Trichloroethane	17.37	1.0	20	0	86.9	74 - 131				
1,1,2,2-Tetrachloroethane	18.92	1.0	20	0	94.6	71 - 121				
1,1,2-Trichloroethane	18.88	1.0	20	0	94.4	80 - 119				
1,1-Dichloroethane	19.95	1.0	20	0	99.7	77 - 125				
1,1-Dichloroethene	15.03	1.0	20	0	75.1	71 - 131				
1,1-Dichloropropene	17.34	1.0	20	0	86.7	78 - 125				
1,2,3-Trichlorobenzene	18.75	1.0	20	0	93.8	69 - 129				
1,2,3-Trichloropropane	19.14	1.0	20	0	95.7	73 - 122				
1,2,4-Trichlorobenzene	17.79	1.0	20	0	88.9	69 - 130				
1,2,4-Trimethylbenzene	18.8	1.0	20	0	94.0	76 - 124				
1,2-Dibromo-3-chloropropane	16.56	1.0	20	0	82.8	62 - 128				
1,2-Dibromoethane	18.34	1.0	20	0	91.7	77 - 121				
1,2-Dichlorobenzene	18.2	1.0	20	0	91.0	80 - 119				
1,2-Dichloroethane	18.39	1.0	20	0	92.0	73 - 128				
1,2-Dichloropropane	19.72	1.0	20	0	98.6	78 - 122				
1,3,5-Trimethylbenzene	18.78	1.0	20	0	93.9	75 - 124				
1,3-Dichlorobenzene	18.54	1.0	20	0	92.7	80 - 119				
1,3-Dichloropropane	19.01	1.0	20	0	95.0	80 - 119				
1,4-Dichlorobenzene	18.17	1.0	20	0	90.8	79 - 118				
2,2-Dichloropropane	17.95	1.0	20	0	89.7	60 - 139				
2-Butanone	36.88	2.0	40	0	92.2	56 - 143				
2-Chlorotoluene	20.23	1.0	20	0	101	79 - 122				
2-Hexanone	34.43	2.0	40	0	86.1	57 - 139				
4-Chlorotoluene	19.24	1.0	20	0	96.2	78 - 122				
4-Isopropyltoluene	17.53	1.0	20	0	87.7	77 - 127				
4-Methyl-2-pentanone	34.96	2.0	40	0	87.4	67 - 130				
Acetone	28.37	2.0	40	0	70.9	39 - 160				
Benzene	20.03	1.0	20	0	100	79 - 120				
Bromobenzene	19.67	1.0	20	0	98.3	80 - 120				
Bromochloromethane	19.67	1.0	20	0	98.3	78 - 123				
Bromodichloromethane	18.9	1.0	20	0	94.5	79 - 125				
Bromoform	17.37	1.0	20	0	86.9	66 - 130				
Bromomethane	16.9	1.0	20	0	84.5	53 - 141				

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Date: 30-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP/Site 18/24
WorkOrder: HS19120702

QC BATCH REPORT

Batch ID: R352668 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
LCS	Sample ID: VLCSW-191216	Units: UG/L			Analysis Date: 16-Dec-2019 11:52					
Client ID:	Run ID: VOA6_352668	SeqNo: 5394311	PrepDate:	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	40.94	2.0	40	0	102	64 - 133				
Carbon tetrachloride	16.06	1.0	20	0	80.3	72 - 136				
Chlorobenzene	18.57	1.0	20	0	92.8	82 - 118				
Chloroethane	15.36	1.0	20	0	76.8	60 - 138				
Chloroform	18.45	1.0	20	0	92.3	79 - 124				
Chloromethane	15.61	1.0	20	0	78.0	50 - 139				
cis-1,2-Dichloroethene	20.37	1.0	20	0	102	78 - 123				
cis-1,3-Dichloropropene	19.72	1.0	20	0	98.6	75 - 124				
Dibromochloromethane	18.83	1.0	20	0	94.1	74 - 126				
Dibromomethane	18.6	1.0	20	0	93.0	79 - 123				
Dichlorodifluoromethane	18.05	1.0	20	0	90.3	32 - 152				
Ethylbenzene	17.86	1.0	20	0	89.3	79 - 121				
Hexachlorobutadiene	19.07	1.0	20	0	95.3	66 - 134				
Isopropylbenzene	16.73	1.0	20	0	83.6	72 - 131				
m,p-Xylene	36.14	2.0	40	0	90.4	80 - 121				
Methylene chloride	19.9	2.0	20	0	99.5	74 - 124				
Naphthalene	15.94	1.0	20	0	79.7	61 - 128				
n-Butylbenzene	16.94	1.0	20	0	84.7	75 - 128				
n-Propylbenzene	18.46	1.0	20	0	92.3	76 - 126				
o-Xylene	18.1	1.0	20	0	90.5	78 - 122				
sec-Butylbenzene	17.31	1.0	20	0	86.6	77 - 126				
Styrene	18.17	1.0	20	0	90.9	78 - 123				
tert-Butylbenzene	17.81	1.0	20	0	89.1	78 - 124				
Tetrachloroethene	16.4	1.0	20	0	82.0	74 - 129				
Toluene	18.78	1.0	20	0	93.9	80 - 121				
trans-1,2-Dichloroethene	19.52	1.0	20	0	97.6	75 - 124				
trans-1,3-Dichloropropene	18.91	1.0	20	0	94.6	73 - 127				
Trichloroethene	18.48	1.0	20	0	92.4	79 - 123				
Trichlorofluoromethane	14.25	1.0	20	0	71.2	65 - 141				
Vinyl chloride	16.06	1.0	20	0	80.3	58 - 137				
Surr: 1,2-Dichloroethane-d4	46.78	1.0	50	0	93.6	81 - 118				
Surr: 4-Bromofluorobenzene	47.92	1.0	50	0	95.8	85 - 114				
Surr: Dibromofluoromethane	47.32	1.0	50	0	94.6	80 - 119				
Surr: Toluene-d8	45.5	1.0	50	0	91.0	89 - 112				

ALS Houston, US

Date: 30-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP/Site 18/24
WorkOrder: HS19120702

QC BATCH REPORT

Batch ID: R352668 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MS	Sample ID: HS19120702-03MS	Units: UG/L			Analysis Date: 16-Dec-2019 17:53					
Client ID: MW22_121119	Run ID: VOA6_352668	SeqNo: 5394324	PrepDate:	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	19.03	1.0	20	0	95.2	78 - 124				
1,1,1-Trichloroethane	17.84	1.0	20	0	89.2	74 - 131				
1,1,2,2-Tetrachloroethane	18.86	1.0	20	0	94.3	71 - 121				
1,1,2-Trichloroethane	18.75	1.0	20	0	93.7	80 - 119				
1,1-Dichloroethane	18.43	1.0	20	0	92.2	77 - 125				
1,1-Dichloroethene	15.37	1.0	20	0	76.8	71 - 131				
1,1-Dichloropropene	18.55	1.0	20	0	92.8	78 - 125				
1,2,3-Trichlorobenzene	18.51	1.0	20	0	92.6	69 - 129				
1,2,3-Trichloropropane	19.26	1.0	20	0	96.3	73 - 122				
1,2,4-Trichlorobenzene	18.37	1.0	20	0	91.9	69 - 130				
1,2,4-Trimethylbenzene	22.92	1.0	20	0	115	76 - 124				
1,2-Dibromo-3-chloropropane	18.43	1.0	20	0	92.1	62 - 128				
1,2-Dibromoethane	18.23	1.0	20	0	91.2	77 - 121				
1,2-Dichlorobenzene	19.46	1.0	20	0	97.3	80 - 119				
1,2-Dichloroethane	21.18	1.0	20	4.318	84.3	73 - 128				
1,2-Dichloropropane	18.6	1.0	20	0	93.0	78 - 122				
1,3,5-Trimethylbenzene	22.03	1.0	20	0	110	75 - 124				
1,3-Dichlorobenzene	20.73	1.0	20	0	104	80 - 119				
1,3-Dichloropropane	18.66	1.0	20	0	93.3	80 - 119				
1,4-Dichlorobenzene	20.07	1.0	20	0	100	79 - 118				
2,2-Dichloropropane	17.29	1.0	20	0	86.5	60 - 139				
2-Butanone	29.88	2.0	40	0	74.7	56 - 143				
2-Chlorotoluene	22.67	1.0	20	0	113	79 - 122				
2-Hexanone	32.07	2.0	40	0	80.2	57 - 139				
4-Chlorotoluene	21.44	1.0	20	0	107	78 - 122				
4-Isopropyltoluene	21.36	1.0	20	0	107	77 - 127				
4-Methyl-2-pentanone	33.71	2.0	40	0	84.3	67 - 130				
Acetone	18.36	2.0	40	0	45.9	39 - 160				
Benzene	20.3	1.0	20	0.8886	97.1	79 - 120				
Bromobenzene	20.84	1.0	20	0	104	80 - 120				
Bromochloromethane	17.41	1.0	20	0	87.1	78 - 123				
Bromodichloromethane	17.58	1.0	20	0	87.9	79 - 125				
Bromoform	16.82	1.0	20	0	84.1	66 - 130				
Bromomethane	13.57	1.0	20	0	67.8	53 - 141				

ALS Houston, US

Date: 30-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP/Site 18/24
WorkOrder: HS19120702

QC BATCH REPORT

Batch ID: R352668 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MS	Sample ID: HS19120702-03MS	Units: UG/L			Analysis Date: 16-Dec-2019 17:53					
Client ID: MW22_121119	Run ID: VOA6_352668	SeqNo: 5394324	PrepDate:	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	37.54	2.0	40	0	93.9	64 - 133				
Carbon tetrachloride	17.59	1.0	20	0	88.0	72 - 136				
Chlorobenzene	19.25	1.0	20	0	96.3	82 - 118				
Chloroethane	14.62	1.0	20	0	73.1	60 - 138				
Chloroform	19.07	1.0	20	2.244	84.1	79 - 124				
Chloromethane	14.5	1.0	20	0	72.5	50 - 139				
cis-1,2-Dichloroethene	21.81	1.0	20	3.183	93.1	78 - 123				
cis-1,3-Dichloropropene	18.51	1.0	20	0	92.5	75 - 124				
Dibromochloromethane	18.22	1.0	20	0	91.1	74 - 126				
Dibromomethane	16.95	1.0	20	0	84.8	79 - 123				
Dichlorodifluoromethane	17.78	1.0	20	0	88.9	32 - 152				
Ethylbenzene	20.11	1.0	20	0	101	79 - 121				
Hexachlorobutadiene	18.45	1.0	20	0	92.2	66 - 134				
Isopropylbenzene	19.75	1.0	20	0	98.8	72 - 131				
m,p-Xylene	40.45	2.0	40	0	101	80 - 121				
Methylene chloride	17.39	2.0	20	0	86.9	74 - 124				
Naphthalene	33.85	1.0	20	0	169	61 - 128				S
n-Butylbenzene	22.09	1.0	20	0	110	75 - 128				
n-Propylbenzene	22.59	1.0	20	0	113	76 - 126				
o-Xylene	19.68	1.0	20	0	98.4	78 - 122				
sec-Butylbenzene	21.81	1.0	20	0	109	77 - 126				
Styrene	18.94	1.0	20	0	94.7	78 - 123				
tert-Butylbenzene	21.9	1.0	20	0	109	78 - 124				
Tetrachloroethene	19.1	1.0	20	0	95.5	74 - 129				
Toluene	19.98	1.0	20	0	99.9	80 - 121				
trans-1,2-Dichloroethene	18.62	1.0	20	0	93.1	75 - 124				
trans-1,3-Dichloropropene	17.38	1.0	20	0	86.9	73 - 127				
Trichloroethene	287.6	1.0	20	270.6	85.1	79 - 123				EO
Trichlorofluoromethane	14.25	1.0	20	0	71.2	65 - 141				
Vinyl chloride	15.32	1.0	20	0	76.6	58 - 137				
Surr: 1,2-Dichloroethane-d4	44.87	1.0	50	0	89.7	81 - 118				
Surr: 4-Bromofluorobenzene	50.14	1.0	50	0	100	85 - 114				
Surr: Dibromofluoromethane	46.68	1.0	50	0	93.4	80 - 119				
Surr: Toluene-d8	50.51	1.0	50	0	101	89 - 112				

ALS Houston, US

Date: 30-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP/Site 18/24
WorkOrder: HS19120702

QC BATCH REPORT

Batch ID: R352668 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MSD	Sample ID: HS19120702-03MSD	Units: UG/L			Analysis Date: 16-Dec-2019 18:41					
Client ID: MW22_121119	Run ID: VOA6_352668	SeqNo: 5394326	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	18.07	1.0	20	0	90.3	78 - 124	19.03	5.18	20	
1,1,1-Trichloroethane	16.59	1.0	20	0	83.0	74 - 131	17.84	7.21	20	
1,1,2,2-Tetrachloroethane	18.26	1.0	20	0	91.3	71 - 121	18.86	3.24	20	
1,1,2-Trichloroethane	18.41	1.0	20	0	92.0	80 - 119	18.75	1.82	20	
1,1-Dichloroethane	17.66	1.0	20	0	88.3	77 - 125	18.43	4.26	20	
1,1-Dichloroethene	14.27	1.0	20	0	71.4	71 - 131	15.37	7.41	20	
1,1-Dichloropropene	17.4	1.0	20	0	87.0	78 - 125	18.55	6.4	20	
1,2,3-Trichlorobenzene	15.53	1.0	20	0	77.7	69 - 129	18.51	17.5	20	
1,2,3-Trichloropropane	18.2	1.0	20	0	91.0	73 - 122	19.26	5.67	20	
1,2,4-Trichlorobenzene	15.56	1.0	20	0	77.8	69 - 130	18.37	16.6	20	
1,2,4-Trimethylbenzene	19.23	1.0	20	0	96.2	76 - 124	22.92	17.5	20	
1,2-Dibromo-3-chloropropane	15.98	1.0	20	0	79.9	62 - 128	18.43	14.2	20	
1,2-Dibromoethane	17.48	1.0	20	0	87.4	77 - 121	18.23	4.21	20	
1,2-Dichlorobenzene	17.63	1.0	20	0	88.2	80 - 119	19.46	9.87	20	
1,2-Dichloroethane	20.42	1.0	20	4.318	80.5	73 - 128	21.18	3.66	20	
1,2-Dichloropropane	17.77	1.0	20	0	88.9	78 - 122	18.6	4.53	20	
1,3,5-Trimethylbenzene	19.47	1.0	20	0	97.3	75 - 124	22.03	12.4	20	
1,3-Dichlorobenzene	18.41	1.0	20	0	92.0	80 - 119	20.73	11.9	20	
1,3-Dichloropropane	18.34	1.0	20	0	91.7	80 - 119	18.66	1.74	20	
1,4-Dichlorobenzene	18.09	1.0	20	0	90.5	79 - 118	20.07	10.4	20	
2,2-Dichloropropane	16.06	1.0	20	0	80.3	60 - 139	17.29	7.4	20	
2-Butanone	30.21	2.0	40	0	75.5	56 - 143	29.88	1.09	20	
2-Chlorotoluene	20.43	1.0	20	0	102	79 - 122	22.67	10.4	20	
2-Hexanone	31.67	2.0	40	0	79.2	57 - 139	32.07	1.26	20	
4-Chlorotoluene	19.38	1.0	20	0	96.9	78 - 122	21.44	10.1	20	
4-Isopropyltoluene	18.51	1.0	20	0	92.6	77 - 127	21.36	14.3	20	
4-Methyl-2-pentanone	33.27	2.0	40	0	83.2	67 - 130	33.71	1.32	20	
Acetone	19.37	2.0	40	0	48.4	39 - 160	18.36	5.37	20	
Benzene	19.21	1.0	20	0.8886	91.6	79 - 120	20.3	5.54	20	
Bromobenzene	19.05	1.0	20	0	95.3	80 - 120	20.84	8.95	20	
Bromochloromethane	16.93	1.0	20	0	84.6	78 - 123	17.41	2.83	20	
Bromodichloromethane	16.91	1.0	20	0	84.6	79 - 125	17.58	3.86	20	
Bromoform	16.74	1.0	20	0	83.7	66 - 130	16.82	0.463	20	
Bromomethane	12.74	1.0	20	0	63.7	53 - 141	13.57	6.26	20	

ALS Houston, US

Date: 30-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP/Site 18/24
WorkOrder: HS19120702

QC BATCH REPORT

Batch ID: R352668 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MSD	Sample ID: HS19120702-03MSD	Units: UG/L			Analysis Date: 16-Dec-2019 18:41					
Client ID: MW22_121119	Run ID: VOA6_352668	SeqNo: 5394326	PrepDate:	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	35.31	2.0	40	0	88.3	64 - 133	37.54	6.12	20	
Carbon tetrachloride	16.31	1.0	20	0	81.5	72 - 136	17.59	7.59	20	
Chlorobenzene	17.84	1.0	20	0	89.2	82 - 118	19.25	7.58	20	
Chloroethane	14.32	1.0	20	0	71.6	60 - 138	14.62	2.11	20	
Chloroform	18.35	1.0	20	2.244	80.6	79 - 124	19.07	3.82	20	
Chloromethane	13.85	1.0	20	0	69.3	50 - 139	14.5	4.58	20	
cis-1,2-Dichloroethene	20.93	1.0	20	3.183	88.7	78 - 123	21.81	4.13	20	
cis-1,3-Dichloropropene	17.54	1.0	20	0	87.7	75 - 124	18.51	5.35	20	
Dibromochloromethane	17.71	1.0	20	0	88.5	74 - 126	18.22	2.86	20	
Dibromomethane	16.66	1.0	20	0	83.3	79 - 123	16.95	1.78	20	
Dichlorodifluoromethane	17.16	1.0	20	0	85.8	32 - 152	17.78	3.54	20	
Ethylbenzene	18.46	1.0	20	0	92.3	79 - 121	20.11	8.56	20	
Hexachlorobutadiene	16.29	1.0	20	0	81.5	66 - 134	18.45	12.4	20	
Isopropylbenzene	17.99	1.0	20	0	89.9	72 - 131	19.75	9.36	20	
m,p-Xylene	37.06	2.0	40	0	92.7	80 - 121	40.45	8.75	20	
Methylene chloride	17.12	2.0	20	0	85.6	74 - 124	17.39	1.53	20	
Naphthalene	15.28	1.0	20	0	76.4	61 - 128	33.85	75.6	20	R
n-Butylbenzene	18.24	1.0	20	0	91.2	75 - 128	22.09	19.1	20	
n-Propylbenzene	19.64	1.0	20	0	98.2	76 - 126	22.59	14	20	
o-Xylene	18.22	1.0	20	0	91.1	78 - 122	19.68	7.69	20	
sec-Butylbenzene	18.91	1.0	20	0	94.5	77 - 126	21.81	14.2	20	
Styrene	18.03	1.0	20	0	90.1	78 - 123	18.94	4.94	20	
tert-Butylbenzene	19.28	1.0	20	0	96.4	78 - 124	21.9	12.7	20	
Tetrachloroethene	17.51	1.0	20	0	87.6	74 - 129	19.1	8.66	20	
Toluene	18.61	1.0	20	0	93.0	80 - 121	19.98	7.13	20	
trans-1,2-Dichloroethene	17.68	1.0	20	0	88.4	75 - 124	18.62	5.2	20	
trans-1,3-Dichloropropene	16.85	1.0	20	0	84.3	73 - 127	17.38	3.06	20	
Trichloroethene	268.7	1.0	20	270.6	-9.54	79 - 123	287.6	6.81	20	SEO
Trichlorofluoromethane	13.54	1.0	20	0	67.7	65 - 141	14.25	5.06	20	
Vinyl chloride	14.65	1.0	20	0	73.3	58 - 137	15.32	4.44	20	
Surr: 1,2-Dichloroethane-d4	45.95	1.0	50	0	91.9	81 - 118	44.87	2.38	20	
Surr: 4-Bromofluorobenzene	50.11	1.0	50	0	100	85 - 114	50.14	0.0703	20	
Surr: Dibromofluoromethane	46.37	1.0	50	0	92.7	80 - 119	46.68	0.662	20	
Surr: Toluene-d8	50.26	1.0	50	0	101	89 - 112	50.51	0.491	20	

ALS Houston, US

Date: 30-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP/Site 18/24
WorkOrder: HS19120702

QC BATCH REPORT

Batch ID: R352668 (0)	Instrument: VOA6	Method: VOLATILES ORGANICS BY METHOD 8260C		
The following samples were analyzed in this batch:				
HS19120702-01	HS19120702-02	HS19120702-03	HS19120702-04	
HS19120702-05	HS19120702-06			

ALS Houston, US

Date: 30-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP/Site 18/24
WorkOrder: HS19120702

**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 Quantitation 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	19-028-0	27-Mar-2020
California	2919, 2019-2020	30-Apr-2020
Dept of Defense	ANAB L2231	20-Dec-2021
Florida	E87611-28	30-Jun-2020
Illinois	2000322019-2	09-May-2020
Kansas	E-10352 2019-2020	31-Jul-2020
Kentucky	123043, 2019-2020	30-Apr-2020
Louisiana	03087, 2019-2020	30-Jun-2020
Maryland	343, 2019-2020	30-Jun-2020
North Carolina	624-2019	31-Dec-2019
North Dakota	R-193 2019-2020	30-Apr-2020
Oklahoma	2019-067	31-Aug-2020
Texas	TX104704231-19-23	30-Apr-2020

Sample Receipt Checklist

Client Name: Bhate Environmental
 Work Order: HS19120702

Date/Time Received: **12-Dec-2019 09:05**
 Received by: **JRM**

Checklist completed by: Sonia West 13-Dec-2019
 eSignature Date

Reviewed by: RJ Modashia 16-Dec-2019
 eSignature Date

Matrices: **Groundwater/Water**

Carrier name: **FedEx Standard 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): 1.5/1.5C IR25
 Cooler(s)/Kit(s): 45573
 Date/Time sample(s) sent to storage: 12/12/19 9:00 PM

- 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:



1608 13th Avenue South, Suite 300

Birmingham Alabama 35205

Tel: 205-918-4000

Fax: 205-918-4050

Chain of Custody and Analytical Request

Page: 1 of 1

Project/Phase No: NWO1312.0150

HS19120702

Bhate Environmental Associates, Inc.
LHAAP/Site 18/24



Facility/Base I.D.: **LHAAP**

Sample Analysis Requested ⁽⁵⁾

Project/Site Name: **LHAAP / Site 18/24**

Client Name:

Collected by: **Scott Beesinger**

Field Sample ID (30 Characters Max)	Date Collected (dd-mm-yyyy)	Time Collected (Military) (hhmm)	Sample Depth (beginning - ending)	SA Code (2)	Sample Number (3)	Sample Matrix (4)	Number of containers	Sample Analysis Requested ⁽⁵⁾				Ambient Blank Lot Control Number	Equipment Blank Lot Control Number	Trip Blank Lot Control Number	Cooler ID
								VOC	PERCHLORATE	TOTAL METALS	1, 4 - DIOXANE				
MW21-121119	11Dec2019	0855	-	N		WG	6	✓	✓	✓	✓				
MW21-121119a	11Dec2019	0855	-	FD		WG	6	✓	✓	✓	✓				
MW22-121119	11Dec2019	1045	-	N		WG	5	✓	✓	✓					
MW22-121119-MS	11Dec2019	1045	-	MS		WG	5	✓	✓	✓					
MW22-121119-MSD	11Dec2019	1045	-	SD		WG	5	✓	✓	✓					
18CPTMW06-121119	11Dec2019	1215	-	N		WG	5	✓	✓	✓					
18CPTMW035W-121119	11Dec2019	1335	-	N		WG	6	✓	✓	✓					
Trip blank	11Dec2019		-	TB		W	2	✓							


COMMENTS:

Cooler # 45573

41C

Relinquished By (Signed) <u>Sumit Patel</u> Date <u>12/11/19</u> Time <u>1430</u>		Received by (signed) <u>JM</u> Date <u>12/12/19</u> Time <u>9:05</u>		Sample Delivery Details / Laboratory Receipt	
Delivered Directly to Lab: <u>FODEP</u>		Shipped: _____		Method of Shipment: <u>FR25</u> No.: <u>105 C/F-0</u>	
Fed <input type="checkbox"/> Ex <input checked="" type="checkbox"/> Airbill <input type="checkbox"/>		Number: _____		Analytical lab: <u>ALS 10450 Stancliff Rd. Suite 210 Houston, TX 77099 (281) 530-5656</u>	
ATTN: <u>SONIA WEST</u>		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

 ALS 10450 Stancliff Rd., Suite 210 Houston, Texas 77099 Tel. +1 281 530 5656 Fax. +1 281 530 5887	CUSTODY SEAL Date: <u>12/11/19</u> Time: <u>1430</u> Name: <u>Scott Beezinger</u> Company: <u>B.H.A.P.</u>	Seal Broken By: <u>SM</u>
		Date: <u>12/12/19</u>

45573 DEC 12 2019



Must Deliver Next Business Day
Time and Temperature Sensitive!

45573

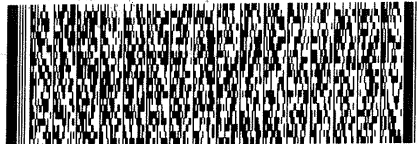
ORIGIN ID: SGRA (903) 930-6193
 SCOTT BEEZINGER
 BHATE ENVIRONMENTAL ASSOCIATES
 1203-B EAST GRAND AVE., PMB202
 MARSHALL, TX 75670
 UNITED STATES US

SHIP DATE: 02DEC19
 ACTWT: 1.00 LB MAN
 CAD: 300130/CAFE3211
 DIMS: 26x14x14 IN

TO **CLIENT SERVICES**
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON TX 77099

(281) 530-5656
 REF: LHAAP - 18/24 - BO 68900 - RJ

RMA: 11111111



FedEx Express



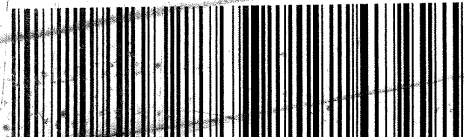
FedEx

TRK# 1251 0292 4151
0221

THU - 12 DEC 10:30A
PRIORITY OVERNIGHT

AB SGRA

77099
TX-US
IAH



FID 5195000 11DEC19 66GA 56AC2/1800/05A2



Case Narrative

Method: 6850
Analysis: Perchlorate
Analysis SOP: LC-MS-CLO4
ALS WO ID(s): 1935345; 1935347; 1935366

Client: ALS Laboratories (Houston, TX)
Matrix: Water
ELMS Batch (HBN): 2331 (254172)

General Set Information: There were eighteen field samples in these Work Orders. The samples were analyzed for perchlorate.

Method Summary: Each sample was prepared as noted below and analyzed using an Agilent 1100 LC/MSD system in select ion monitoring (SIM) mode at m/z 83 and 85, which corresponds to the loss of one oxygen atom from the perchlorate molecule. ChemStation software was used for instrument control and data analysis. The ion ratio of m/z 83 to 85 was used to positively identify the response peak as perchlorate. Quantitation was performed using the m/z 83 peak area. An internal standard (ISTD) of ^{18}O labeled perchlorate was added to each sample to establish the perchlorate peak retention time and used in quantitation.

Sample Preparation: A 10.0mL aliquot of each sample was transferred into a 15-mL centrifuge tube. 50 μL of an ^{18}O labeled perchlorate solution was added to each sample as an internal standard. The samples were then capped, vortexed, and filtered into autosampler vial using Phenex PES membrane 0.45 μm Syringe filters.

Holding Times: Holding times were met for all analyses.

Dilutions: Samples 1935345003/04 failed the 50-150% method requirement for ISTD recoveries. These samples were re-analyzed and reported at dilutions of 1:2 and 1:5, respectively. Field sample 1935347003 was analyzed and reported from a 1:10 dilution. Field samples 1935345006/10 were analyzed and reported from 1:100 dilutions. Field samples 1935345007 and 1935347001/02 were analyzed and reported from 1:1,000 dilutions. Field samples 1935345008/09 were analyzed and reported from 1:10,000 dilutions. The reporting limits have been adjusted accordingly.

Method QC data: The method blank (LMB 689525) was less than 1/2 the CRDL. The recovery for the LCS (689526) was within acceptable parameters.



MS/MSD Analysis: MS/MSD was performed on samples 1935347004/05 (Client ID: MW22_121119). 3.0 μ L of Working Standard Solution Horizon ID 49947 was added to 10.0mL of sample preparation. The spike target was 3. μ g/L. The MS/MSD failed QC acceptance criteria for percent recoveries. The relative percent difference (RPD) passed acceptance criteria. The Matrix Spike and Matrix Spike duplicate is reported for the clients' information only. The sample matrix may be inappropriate for the method selected.

Instrument QC: Instrument initial and continuing calibrations were performed in accordance with published procedures.

NC/CAR(s): NA

Sample Calculation: Samples were reported in μ g/L. Results were calculated in μ g/L by the equation $(A) \times (B)$,

where: A = Analyte concentration from the standard curve (μ g/L)
B = Dilution performed at time of analysis

Miscellaneous Comments: These samples were analyzed in accordance with the requirements found in the DOD QSM Version 5.1.1. The Reporting Limit Verification Standard (RLVS – 689523) is reported from the analysis of the Laboratory Control Sample (LCS – 689522) at a level of 3.0 μ g/L. Due to limitations of the Chemstation Software, some of the chromatographic peaks may require manual integrations. A manual integration was performed for one of the Initial Calibration analyses (datafile: 20SEPI03) along with datafiles 23DEC19D21/23.

Thomas Bosch December 30, 2019
Analyst Date



ANALYTICAL REPORT

Report Date: December 30, 2019

RJ Modashia
 ALS Environmental (Houston)
 10450 Stancliff Road
 Suite 210
 Houston, TX 77099

Phone: 281 530-5656

E-mail: RJ.Modashia@ALSGlobal.com

Workorder: **34-1935347**

Project ID: HS19120702

Purchase Order: HS19120702

Project Manager Kevin W. Griffiths

Client Sample ID	Lab ID	Collect Date	Receive Date	Sampling Site
MW21_121119	1935347001	12/11/19	12/17/19	
MW21_121119_a	1935347002	12/11/19	12/17/19	
MW22_121119	1935347003	12/11/19	12/17/19	
18CPTMW06_121119	1935347006	12/11/19	12/17/19	
18CPTMW03SW_121119	1935347007	12/11/19	12/17/19	

Client QC ID *	Lab ID	Collect Date	Receive Date	Sampling Site
MW22_121119MS	1935347004	12/11/19	12/17/19	
MW22_121119MSD	1935347005	12/11/19	12/17/19	

*Client QC is reported as part of the Quality Control results report, if requested.



ANALYTICAL REPORT

Workorder: 34-1935347

Client: ALS Environmental
(Houston)

Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: MW21_121119	Sampling Site: NA	Collected: 12/11/2019				
Lab ID: 1935347001	Media: 125 mL Nalgene	Received: 12/17/2019				
Matrix: Water	Sampling Parameter: NA					
Analysis Method - EPA 6850, DoD QSM						
Preparation: Not Applicable	Analysis: EPA 6850, DoD QSM Water Batch: ELMS/2331 (HBN: 254172) Analyzed: 12/23/2019 11:39	Instrument ID: LCMS04 %Solids: NA Report Basis: Wet				
Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	13000	1000	2000	4000	1000	

Sample ID: MW21_121119_a	Sampling Site: NA	Collected: 12/11/2019				
Lab ID: 1935347002	Media: 125 mL Nalgene	Received: 12/17/2019				
Matrix: Water	Sampling Parameter: NA					
Analysis Method - EPA 6850, DoD QSM						
Preparation: Not Applicable	Analysis: EPA 6850, DoD QSM Water Batch: ELMS/2331 (HBN: 254172) Analyzed: 12/23/2019 11:53	Instrument ID: LCMS04 %Solids: NA Report Basis: Wet				
Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	13000	1000	2000	4000	1000	

Sample ID: MW22_121119	Sampling Site: NA	Collected: 12/11/2019				
Lab ID: 1935347003	Media: 125 mL Nalgene	Received: 12/17/2019				
Matrix: Water	Sampling Parameter: NA					
Analysis Method - EPA 6850, DoD QSM						
Preparation: Not Applicable	Analysis: EPA 6850, DoD QSM Water Batch: ELMS/2331 (HBN: 254172) Analyzed: 12/23/2019 12:07	Instrument ID: LCMS04 %Solids: NA Report Basis: Wet				
Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	210	10	20	40	10	

Sample ID: 18CPTMW06_121119	Sampling Site: NA	Collected: 12/11/2019				
Lab ID: 1935347006	Media: 125 mL Nalgene	Received: 12/17/2019				
Matrix: Water	Sampling Parameter: NA					
Analysis Method - EPA 6850, DoD QSM						
Preparation: Not Applicable	Analysis: EPA 6850, DoD QSM Water Batch: ELMS/2331 (HBN: 254172) Analyzed: 12/23/2019 12:49	Instrument ID: LCMS04 %Solids: NA Report Basis: Wet				
Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U



ANALYTICAL REPORT

Workorder: 34-1935347

Client: ALS Environmental
(Houston)

Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: 18CPTMW03SW_121119	Sampling Site: NA	Collected: 12/11/2019				
Lab ID: 1935347007	Media: 125 mL Nalgene	Received: 12/17/2019				
Matrix: Water	Sampling Parameter: NA					
Analysis Method - EPA 6850, DoD QSM						
Preparation: Not Applicable	Analysis: EPA 6850, DoD QSM Water Batch: ELMS/2331 (HBN: 254172) Analyzed: 12/23/2019 13:03	Instrument ID: LCMS04 %Solids: NA Report Basis: Wet				
Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	9.1	1.0	2.0	4.0	1	

Comments

Quality Control: EPA 6850, DoD QSM - (HBN: 254172)

Samples 1935345003/04 failed the 50-150% method requirement for ISTD recoveries. These samples were re-analyzed and reported at dilutions of 1:2 and 1:5, respectively. Field sample 1935347003 was analyzed and reported from a 1:10 dilution. Field samples 1935345006/10 were analyzed and reported from 1:100 dilutions. Field samples 1935345007 and 1935347001/02 were analyzed and reported from 1:1,000 dilutions. Field samples 1935345008/09 were analyzed and reported from 1:10,000 dilutions. The reporting limits have been adjusted accordingly.

Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Method	Analyst	Peer Review
EPA 6850, DoD QSM	/S/ Thomas Bosch 12/30/2019 12:07	/S/ Stephen Brose 12/30/2019 15:01

Laboratory Contact Information

ALS Environmental
960 W Levoy Drive
Salt Lake City, Utah 84123

Phone: (801) 266-7700
Email: als@alst.com
Web: www.alst.com



ANALYTICAL REPORT

Workorder: 34-1935347

Client: ALS Environmental
(Houston)

Project Manager: Kevin W. Griffiths

General Lab Comments

The results provided in this report relate only to the items tested.
 Samples were received in acceptable condition unless otherwise noted.
 Samples have not been blank corrected unless otherwise noted.
 This test report shall not be reproduced, except in full, without written approval of ALS.

ALS provides professional analytical services for all samples submitted. ALS is not in a position to interpret the data and assumes no responsibility for the quality of the samples submitted.

All quality control samples processed with the samples in this report yielded acceptable results unless otherwise noted.

ALS is accredited for specific fields of testing (scopes) in the following testing sectors. The quality system implemented at ALS conforms to accreditation requirements and is applied to all analytical testing performed by ALS. The following table lists testing sector, accreditation body, accreditation number and website. Please contact these accrediting bodies or your ALS project manager for the current scope of accreditation that applies to your analytical testing.

Testing Sector	Accreditation Body (Standard)	Certificate Number	Website
Environmental	PJLA (DoD ELAP)	L17-506	http://www.pjlab.com
	PJLA (ISO 17025)	L17-507-R1	http://www.pjlab.com
	Utah (TNI)	UT00953	http://lams.nelac-institute.org/search
	Iowa (TNI)	IA# 376	http://www.shl.uiowa.edu/labcert/idnr/
	Kansas	E-10416	http://www.kdheks.gov/envlab/disclaimer.html
Industrial Hygiene	AIHA (ISO 17025 & AIHA IHLAP)	101574	http://www.aihaaccreditedlabs.org
	DOECAP-AP	L18-606	http://www.pjlab.com
	Washington	C596	https://ecology.wa.gov/Regulations-Permits/Permits-certifications/Laboratory-Accreditation
Dietary Supplements	PJLA (ISO 17025)	L17-507-R1	http://www.pjlab.com

Result Symbol Definitions

MDL = Method Detection Limit, a statistical estimate of method/media/instrument sensitivity.

RL = Reporting Limit, a verified value of method/media/instrument sensitivity.

CRDL = Contract Required Detection Limit

Reg. Limit = Regulatory Limit.

ND = Not Detected, testing result not detected above the MDL or RL.

< Means this testing result is less than the numerical value.

** No result could be reported, see sample comments for details.

Qualifier Symbol Definitions

U = Qualifier indicates that the analyte was not detected above the MDL.

J = Qualifier Indicates that the analyte value is between the MDL and the RL. It is also used to indicate an estimated value for tentatively identified compounds in mass spectrometry where a 1:1 response is assumed.

B = Qualifier indicates that the analyte was detected in the blank.

E = Qualifier indicates that the analyte result exceeds calibration range.

P = Qualifier indicates that the RPD between the two columns is greater than 40%.



Quality Control Sample Batch Report

00957982

Analysis Information

Workorder: 1935347

Limits: Client SOW/Contract Specified
Basis: DoD QSM□□

Preparation: NA
Batch: NA
Prepared By: NA

Analysis: EPA 6850, DoD QSM
Batch: ELMS/2331 (HBN: 254172)
Analyzed By: Thomas Bosch

Blank

LMB: 689525 Analyzed: 12/23/2019 08:53 Units: ug/L			
Analyte	Result	MDL	RL
Perchlorate	ND	1	2.00

Laboratory Control Sample

LCS: 689522 Analyzed: 12/23/2019 08:25 Dilution: 1 Units: ug/L				
Analyte	Result	Target	% Rec	QC Limits
Perchlorate	3.20	3.00	107	78.8 123.8

Matrix Spike - Matrix Spike Duplicate

Sample: 1935347003 Analyzed: 12/23/2019 12:07 Dilution: 10 Units: ug/L		MS: 1935347004 Analyzed: 12/23/2019 14:45 Dilution: 10 Units: ug/L			MSD: 1935347005 Analyzed: 12/23/2019 14:59 Dilution: 10 Units: ug/L				
Analyte	Result	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits
Perchlorate	210	250	30	▲ 142	78.8 123.8	251	▲ 146	0.487	0.0 20.0

Comments

Samples 1935345003/04 failed the 50-150% method requirement for ISTD recoveries. These samples were re-analyzed and reported at dilutions of 1:2 and 1:5, respectively. Field sample 1935347003 was analyzed and reported from a 1:10 dilution. Field samples 1935345006/10 were analyzed and reported from 1:100 dilutions. Field samples 1935345007 and 1935347001/02 were analyzed and reported from 1:1,000 dilutions. Field samples 1935345008/09 were analyzed and reported from 1:10,000 dilutions. The reporting limits have been adjusted accordingly.

QC Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Analyst	Peer Review
/S/ Thomas Bosch 12/30/2019 12:39	/S/ Stephen Brose 12/30/2019 15:01

Symbols and Definitions

- * - Analyte above reporting limit or outside of control limits
- ▲ - Sample result is greater than 4 times the spike added
- - Sample and Matrix Duplicate less than 5 times the reporting limit
- - Result is above the calibration range
- # - The Matrix Spike, Matrix Spike duplicate or Matrix Duplicate is reported for your information only. The sample matrix may be inappropriate for the method selected.

- RPD - Relative % Difference (Spike / Spike Duplicate)
- ND - Not Detected (U - Qualifier also flags analyte as not detected)
- NA - Not Applicable
- QC results are not adjusted for moisture correction, where applicable



10450 Stancliff Rd, Ste 210
 Houston, TX 77099
 T: +1 281 530 5656
 F: +1 281 530 5887
 www.alsglobal.com

18698/#2

Subcontract Chain of Custody

SAMPLING STATE: Texas

COC ID: 12851

SUBCONTRACT TO:

1935347

ALS Laboratory Group
 960 LeVoy Dr
 Salt Lake City, UT 84123

Phone: +1 801 266 7700

CUSTOMER INFORMATION:

Company: ALS Houston
Contact: RJ Modashia
Address: 10450 Stancliff Rd, Ste 210
Phone: +1 281 530 5656
Email: RJ.Modashia@alsglobal.com
Alternate Contact: Jumoke M. Lawal
Email: jumoke.lawal@alsglobal.com

INVOICE INFORMATION:

Company: ALS Houston
Contact: Accounts Payable
Address: 10450 Stancliff Rd, Ste 210
Phone: +1 281 530 5656
Reference: HS19120702
TSR: Danielle Winnings

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	HS19120702-01	MW21_121119	Groundwater	11 Dec 2019 08:55
	SUB_Perch-6850			27 Dec 2019
2.	HS19120702-02	MW21_121119a	Groundwater	11 Dec 2019 08:55
	SUB_Perch-6850			27 Dec 2019
3.	HS19120702-03	MW22_121119 <i>mshmsd</i>	Groundwater	11 Dec 2019 10:45
	SUB_Perch-6850			27 Dec 2019
4.	HS19120702-04	18CPTMW06_121119	Groundwater	11 Dec 2019 12:15
	SUB_Perch-6850			27 Dec 2019
5.	HS19120702-05	18CPTMW03SW_121119	Groundwater	11 Dec 2019 01:33
	SUB_Perch-6850			27 Dec 2019

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

QC Level: DOD IV (DoD Data Package)

HS19120702-03 = MS/MSD.



Subcontract Chain of Custody

SAMPLING STATE: Texas

COC ID: 12851

Relinquished By: _____
[Signature]

Date/Time: 12/16/19 1800.

Received By: _____

Date/Time: _____

Cooler ID(s): _____

Temperature(s): _____

ALS-SALT LAKE CITY-RELATED INFORMATION REPORT (CRIR)

COOLER OR CONTAINER INFORMATION CHECKLIST (Fill In or Circle)

Client Name: ALS Houston Project/Task/Site: _____
 Date/Time of Receipt: 2/17/19 900 Number of Coolers Received: 1 1935347

Condition of Coolers: Acceptable/Unacceptable	Temperature Control: Present/Not Included
Cooler Custody Seals: Present/Absent/NA	Location Temp Taken: Control/Between Samples
Container Custody Seals: Present/Absent/NA	Are all temperatures within project specific guidelines? Yes/No/NA
Ice Present: Yes/No/NA	VOA Headspace Present? Yes/No/NA
Intact/Broken/NA	
Frozen/Melted/NA	

pH Check Performed:	Metals	Yes/No/NA	Total Phenolics	Yes/No/NA	NO3/NO2	Yes/No/NA
	Cyanide	Yes/No/NA	TPH - 418.1	Yes/No/NA	Oil & Grease	Yes/No/NA
	Sulfide	Yes/No/NA	COD	Yes/No/NA	Total Phosphorous	Yes/No/NA
	Ammonia	Yes/No/NA	TKN	Yes/No/NA	Gross A.B, Gamma Spec	Yes/No/NA

Cooler Received	Cooler Condition	Temp.	Cooler Received	Cooler Condition	Temp.	Cooler Received	Cooler Condition	Temp.
1	good	2 °C	4		°C	7		°C
2		°C	5		°C	8		°C
3		°C	6		°C	9		°C

Taken By: [Signature] [Signature] [Signature]
 Signature Printed Name Date

CLIENT-RELATED INFORMATION

<input type="checkbox"/> Missing Cooler	<input type="checkbox"/> Missing Samples/Bottles	<input type="checkbox"/> Incorrect Preservation	<input type="checkbox"/> Insufficient Sample Volume
<input type="checkbox"/> Cooler Conditions	<input type="checkbox"/> Broken/Leaking Samples	<input type="checkbox"/> pH Criteria Not Met	<input type="checkbox"/> Chain of Custody Problems
<input type="checkbox"/> Missing Paperwork	<input type="checkbox"/> Incorrect Bottle Type	<input type="checkbox"/> Residual Chlorine Present	<input type="checkbox"/> Other:
<input type="checkbox"/> Missing/Incorrect Bottle Labels	<input type="checkbox"/> Cooler Temperatures Out of Range	<input type="checkbox"/> Head Space in Bottles	

BRIEFLY DESCRIBE THE PROBLEM AND THE ACTION TAKEN:

Client Notified? YES NO

Response Required Within 24 Hours

PROJECT MANAGEMENT

PROJECT MANAGER COMMENTS:

ALS Project Manager: _____ Returned to Sample Receipt by: _____ Date: _____
 Printed Name Signature

Must Deliver Next Business Day
Time and Tempature Sensitive!



ORIGIN ID: 8GRA (281) 530-5656
CLIENT SERVICES
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON, TX 77088
UNITED STATES US

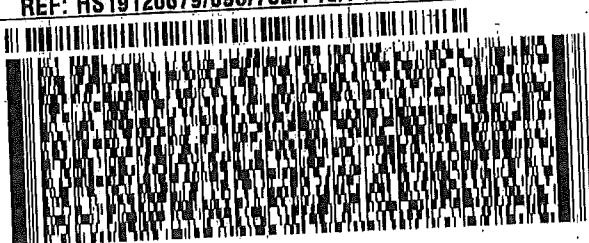
SHIP DATE: 16DEC19
ACTWGT: 47.30 LB
CAD: 3001307CAFE3211
DIMS: 26x14x14 IN
BILL THIRD PARTY

TO **SAMPLE RECEIVING
ALS ENVIRONMENTAL
960 W. LEVOY DRIVE**

SALT LAKE CITY UT 84123

(801) 286-7700

REF: HS19120679/696/702/715/745/765/843/844-



**FedEx
Express**



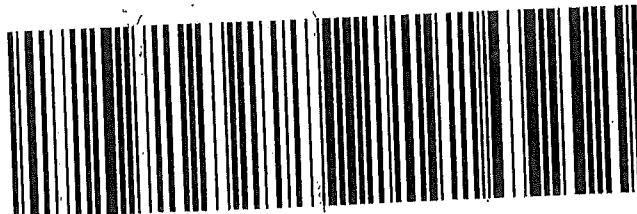
1J15118060501W

TRK# 1251 0292 9451
0201

**TUE - 17 DEC 3:00P
STANDARD OVERNIGHT**

AX BTFA

**84123
UT-US SLC**



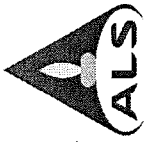


ALS Environmental
CHAIN-OF-CUSTODY

Project / Job / Task: HS19120702		Split:		Workorder ID: 1935347		Level: ENV_LVL4		Requested Analysis	
Client: ALS Environmental (Houston)		Account: 8101		Type: 125Poly		EPA 6850, DGD GSM			
Comments:									
Item	Collect Date/Time	Sample ID	Lab ID	QC	Matrix	ID(s)	Containers	Count	
1	12/11/2019 08:55	MW21_121119	1935347001		Water	A		1	
2	12/11/2019 08:55	MW21_121119_a	1935347002		Water	A		1	
3	12/11/2019 10:45	MW22_121119	1935347003		Water	A		1	
4	12/11/2019 10:45	MW22_121119MS	1935347004	MS	Water	A		1	
5	12/11/2019 10:45	MW22_121119MSD	1935347005	MSD	Water	A		1	
6	12/11/2019 12:15	18CPTMW06_121119	1935347006		Water	A		1	
7	12/11/2019 01:33	18CPTMW03SW_121119	1935347007		Water	A		1	
8									
9									
10									

Page 5 of 164

ORIGINAL FIELD SAMPLE CHAIN-OF-CUSTODY					SAMPLE PREPARATION / ANALYSIS CHAIN-OF-CUSTODY				
Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location	Sample Prep / Analysis for:	Prepared / Analyzed by:	Received By: (Signature)	Date / Time	Reason for Transfer / Storage Location	Lab Notebook No.:
<i>Julie W...</i>	12/17/2019 09:06	ALS Sample Receiving	Sample Login						
<i>R.33.1</i>	12-21-19 12:00	<i>T. Bush</i>	<i>Storage</i>						
			<i>copy analysis</i>						



Batch Worklist

HBN: 254172

Instrument:



Status: WP

Created: 12/23/2019 08:02

Analyst: T. Bosch

Batch: ELMS/2331

Rule: EPA 6850, DoD QSM Water

Workorder: 1935345 [ENV_LVL4]

Workorder: 1935347 [ENV_LVL4]

Workorder: 1935366 [ENV_LVL4]

Pos	Lab ID	Sample ID	Prep Initial	Prep Final	Dust Weight	Type	Mx	Container	Procedure	Mgr	Expire Date	Due Date	Run Date
1	689521	CCV for HBN 254172 [ELMS/2331]				CCV	3	E685041C3Q	E685041C3Q	5311		12/31/2019	
2	689522	LCS for HBN 254172 [ELMS/2331]				LCS	3	E6850Q413Q	E6850Q413Q	5311		12/31/2019	
3	689523	RLVS for HBN 254172 [ELMS/2331]				RLVS	3	E685041C3Q	E685041C3Q	5311		12/31/2019	
4	689524	ICS for HBN 254172 [ELMS/2331]				ICS	3	E6850_D3Q	E6850_D3Q	5311		12/31/2019	
5	689525	LMB for HBN 254172 [ELMS/2331]				LMB	3	E6850Q413Q	E6850Q413Q	5311		12/31/2019	
6	1935345001	MW22_121219				SAMPLE	3	1935345001-A	E6850Q41.3	5480	1/9/2020	12/31/2019	
7	1935345002	MW22_121219_a				SAMPLE	3	1935345002-A	E6850Q41.3	5480	1/9/2020	12/31/2019	
8	1935345003	C08_121219				SAMPLE	3	1935345003-A	E6850Q41.3	5480	1/9/2020	12/31/2019	
9	1935345004	18CPTMW24_121219				SAMPLE	3	1935345004-A	E6850Q41.3	5480	1/9/2020	12/31/2019	
10	1935345005	18CPTMW07_121219				SAMPLE	3	1935345005-A	E6850Q41.3	5480	1/9/2020	12/31/2019	
11	1935345006	109_121219				SAMPLE	3	1935345006-A	E6850Q41.3	5480	1/9/2020	12/31/2019	
12	1935345007	MW3_121219				SAMPLE	3	1935345007-A	E6850Q41.3	5480	1/9/2020	12/31/2019	
13	1935345008	MW23_121219				SAMPLE	3	1935345008-A	E6850Q41.3	5480	1/9/2020	12/31/2019	
14	689528	CCV for HBN 254172 [ELMS/2331]				CCV	3	E685041C3Q	E685041C3Q	5311		12/31/2019	
15	1935345009	MW23_121219_a				SAMPLE	3	1935345009-A	E6850Q41.3	5480	1/9/2020	12/31/2019	
16	1935345010	I25_121219				SAMPLE	3	1935345010-A	E6850Q41.3	5480	1/9/2020	12/31/2019	
17	1935347001	MW21_121119				SAMPLE	3	1935347001-A	E6850Q41.3	5480	1/8/2020	12/31/2019	
18	1935347002	MW21_121119_a				SAMPLE	3	1935347002-A	E6850Q41.3	5480	1/8/2020	12/31/2019	
19	1935347003	MW22_121119				SAMPLE	3	1935347003-A	E6850Q41.3	5480	1/8/2020	12/31/2019	
20	1935347004	MW22_121119MS				MS	3	1935347004-A	E6850Q413Q	5480		12/31/2019	
21	1935347005	MW22_121119MSD				MSD	3	1935347005-A	E6850Q413Q	5480		12/31/2019	
22	1935347006	18CPTMW06_121119				SAMPLE	3	1935347006-A	E6850Q41.3	5480	1/8/2020	12/31/2019	
23	1935347007	18CPTMW03SW_121119				SAMPLE	3	1935347007-A	E6850Q41.3	5480	1/8/2020	12/31/2019	
24	1935366001	LH18/24-SP650_121219_AIX				SAMPLE	3	1935366001-A	E6850Q41.3	5480	1/9/2020	12/31/2019	
25	689529	CCV for HBN 254172 [ELMS/2331]				CCV	3	E685041C3Q	E685041C3Q	5311		12/31/2019	
26	689664	CCV for HBN 254172 [ELMS/2331]				CCV	3	E685041C3Q	E685041C3Q	5311		12/31/2019	



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Analytical Documentation

Analyst Write-up

ALS Work Order #'s & Sample # ()'s: 1935345 (001-10); 1935347 (001-07); 1935366 (001)
 ELMS Batch/HBN ID: 2331 (254172)
 Prep Date: 12/21/2019 Analysis Date: 12/23/2019 Analyst: Tom Bosch
 Analyte: **Perchlorate** Matrix: **Water** Method: **6850**
 Sequence: \\HPCHEM\1\SEQUENCE\CLO4\2019\DEC\23DEC19D.s
 Reported DL: **1.0µg/L** Reported LOD: **2.0µg/L** Reported LOQ: **4.0µg/L**

SAMPLE PREPARATION/ANALYSIS:

Water: Samples were prepared by Tom Bosch. 10.0mL of each sample was pipetted into a 15-mL centrifuge tube, and 50µL of an oxygen-18 labeled perchlorate solution was added as an internal standard. The samples were capped, vortexed, and filtered with Phenex PES membrane 0.45µm Syringe filters prior to analysis.

REAGENTS: Eluent A1: 95% ASTM Type II water (ALS)/5%ACN (B&J Lot DU461-US)/0.1% glacial acetic acid (JT-Baker Lot 122550).
 Eluent B1: 95% ACN (B&J Lot DU461-US)/5% ASTM Type II water (ALS)/0.1% glacial acetic acid (JT-Baker Lot 122550).

STANDARDS: Internal Standard Spiking Solution Horizon# 47863. Dilutions of Working Standards (Horizon: 49947/48) used for ICAL, CCV's, RLVS and ICS.

CALIBRATION CURVE: Used curve from 09/20/2019, sequence 20SEP19D.s Offline Quantitation Method: CLO4-DP3.M

INSTRUMENT CONDITIONS: Samples were analyzed with an Agilent 1100 LC/MSD system, in negative SIM mode, monitoring m/z 83, 85, and 89.

Instrument ID: LCMS04 Online Acquisition Method: CLO4-AQN.M Fragmentor: 160 Output Gain: 8 Injection Volume: 35µL
 Column: KP-RPPX C8 separator, 250mm Mobile Phase: 70% Eluent A1; 30% Eluent B1 Run time: 12.0min.

FLOW GRADIENT:

Time (min.)	Flow (mL/min)
0	0.65
5.8	0.65
5.9	0.25
10.3	0.25
10.5	0.65
12.0	0.65

QC DATA: 3.0µL of QC Solution Horizon ID 47516 was used for LCS 689522; Target = 3.0µg/L. ASTM type II water was used for LMB 689525.

MS/MSD: The Matrix Spike and duplicate (MS/MSD) was performed on samples 1935347004/05 (Client ID's: MW22_121119). 3.0µl of Working Standard Solution Horizon ID 49947 was added to 10.0mL of sample preparation. Spike target = 3.0µg/L.

COMMENTS:

- 1) Results reported in µg/L. Samples 1935345003/04 failed the 50-150% method requirement for ISTD recoveries. These samples were re-analyzed and reported at dilutions of 1:2 and 1:5, respectively. Field sample 1935347003 was analyzed and reported from a 1:10 dilution. Field samples 1935345006/10 were analyzed and reported from 1:100 dilutions. Field samples 1935345007 and 1935347001/02 were analyzed and reported from 1:1,000 dilutions. Field samples 1935345008/09 were analyzed and reported from 1:10,000 dilutions. The reporting limits have been adjusted accordingly.
- 2) All QC, Blank, CCV, and MS/MSD results were within method parameters, except for the following. The MS/MSD failed QC acceptance criteria for percent recoveries. The relative percent difference (RPD) passed acceptance criteria. The Matrix Spike and Matrix Spike duplicate is reported for the clients' information only. The sample matrix may be inappropriate for the method selected.
- 3) Sample data can be viewed at two directories within the ALS system: \\ALSLTWS013\LCMS\LCMS04\2019\DEC\HBN# or through NuGenesis\Tree\PrintData\LCMS\DefaultView.
- 4) Notebook: \\sltws013\ORGANIC\BOSCH\LCMS\Perchlorates\Waters\2019\254172-DoD-ALS-Hstn LCMS4 or through \\ALSLTWS013\DATAREVIEW\HBN#
- 5) The Reporting Limit Verification Standard (RLVS – 689523) is reported from the analysis of the Laboratory Control Sample (LCS – 689522) at a level of 3.0µg/L.
- 6) Due to limitations of the Chemstation Software, some of the chromatographic peaks require manual integration. Manual Integrations were performed for one of the Initial Calibration analyses (datafile: 20SEP103) along with datafile 23DEC19D21/23.

5.5 Chromatography (GC, HPLC and LC/MS) Technical Review

Note: It is the peer reviewer's responsibility to ensure that appropriate criteria are used as defined in the HORIZON PROFILE. The evaluation criteria are prioritized as per Section 2.2 of this SOP. These items must be checked for all projects. The following checklist will be completed by both the analyst and the peer reviewer and scanned into the HBN folder with the raw data.

Chromatography (GC, HPLC, LC/MS) Technical Review Criteria	Analyst Initials	Reviewer Initials
Batch(es)/SDG: <u>ELMS: 2331 HBN: 254172</u>		
Sample Set IDs if Applicable: <u>1935345 1935347 1935366</u>		
Sample positions on autosampler verified against instrument sequence	TB	NA
Calibration standards analyzed and meets criteria	TB	SB
Standards traceability checked and meets criteria	TB	SB
Standard curve coefficients evaluated and meet criteria	TB	SB
ICVs analyzed and meet acceptance criteria	TB	SB
CCVs analyzed and meet acceptance criteria	TB	SB
Retention Time Windows checked	TB	SB
For method 8081A, Endrin/DDT Breakdown is checked for compliance	—	—
Surrogate recoveries checked and appropriately addressed	—	—
Method Preparation Blanks analyzed and meet acceptance criteria	TB	SB
MSs, MSDs, and/or MDs analyzed and calculations checked; applicable	TB	SB
RLVS analyzed	TB	SB
Preparation and analysis hold times met	TB	SB
Preparation deviations and re-preparations noted when performed	TB	SB
Analysis deviations and re-analyses noted when performed	TB	SB
Sample dilution factors noted on reports	TB	SB
Electronic records in HBN transcription accuracy and completeness	TB	SB
Preparation and analysis calculations checked	TB	SB
NCRs are completed as necessary NC/CAR# _____	TB	SB
Report forms are complete and accurate	TB	SB
Manual integrations checked	TB	SB



STANDARD REPORT

Working Standard - CLO4ISTDWRK

CLO4ISTDWRK		Description - Perchlorate ISTD Wrk 1,000ug/L			
Standard: 49946		Created By: Thomas Bosch		Amount: 25 mL	
MFG: ALS/SLC		Create Date: 09/23/2019 03:09PM		Expires: 09/19/2020	
MFG Lot: TNB: 09/20/2019		Verified By: Thomas Bosch		Usable: Yes	
Pipette ID: Not Provided		Verify Date:		Lab Lot: CLO4ISTDWRK	
Pos.	Analyte	Name	Concentration		
1	14797-73-0-8385	Perchlorate 83:85 Ratio	1000 ug/L		
2	14797-73-0-89	Perchlorate 89	1000 ug/L		
Composition					
Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
47863	CLO4ISTDSTK	Perchlorate ISTD Stock	CLO4ISTDSTK	0.25 mL	12/05/2028



STANDARD REPORT

Constituent

Stock Standard - CLO4ISTDSTK

CLO4ISTDSTK		Description - Perchlorate ISTD Stock	
Standard: 47863	Created By: Thomas Bosch	Amount: 1 mL	
MFG: Cambridge Isotope	Create Date: 05/23/2019 10:05AM	Expires: 12/05/2028	
MFG Lot: SDIH-016	Verified By: Thomas Bosch	Usable: Yes	
Part ID: OLM-7310-S	Verify Date:	Lab Lot: CLO4ISTDSTK	
Pos.	Analyte	Name	Concentration
1	14797-73-0-8385	Perchlorate 83:85 Ratio	100 ug/mL
2	14797-73-0-89	Perchlorate 89	100 ug/mL



STANDARD REPORT

Working Standard - CLO4 WRK

CLO4 WRK		Description - 6850 WKG Std 100.ug/L			
Standard: 49948		Created By: Thomas Bosch		Amount: 10 mL	
MFG: ALS/SLC		Create Date: 09/20/2019 03:09PM		Expires: 07/25/2020	
MFG Lot: TNB: 09/20/2019				Usable: Yes	
Pipette ID: Not Provided				Lab Lot: CLO4 WRK	
Pos.	Analyte	Name	Concentration		
1	14797-73-0	Perchlorate	0.1 ug/mL		
2	14797-73-0-8385	Perchlorate 83:85 Ratio	0.1 ug/mL		
Composition					
Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
49947	CLO4 INT	6850 Intermdt AccStd 10.ug/mL	CLO4 INT	0.1 mL	07/25/2020



STANDARD REPORT

Constituent

Stock Standard - CLO4 STOCK

CLO4 STOCK		Description - 6850 Stock AccStd 1,000ug/mL	
Standard: 43659		Created By: Thomas Bosch	
MFG: AccuStandard		Create Date: 09/17/2018 09:09AM	
MFG Lot: 218065075		Expires: 07/25/2020	
Part ID: IC-PER-10X-1		Usable: Yes	
		Lab Lot: CLO4 STOCK	
Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	1000 ug/mL
2	14797-73-0-8385	Perchlorate 83:85 Ratio	1000 ug/mL



STANDARD REPORT

Constituent

Solvent Standard - ASTM H2O

ASTM H2O		Description - ASTM Type II Water	
Standard: 109	Created By: ALS Support (Lims)	Amount: 1000 L	
MFG: DCL In House	Create Date: 10/06/2005 09:10AM	Expires: 11/07/2025	
MFG Lot: Not Provided		Usable: Yes	
Part ID: Not Provided		Lab Lot: LAB 109	
Pos.	Analyte	Name	Concentration
Solvent - Analyte(s) not applicable			



STANDARD REPORT

Constituent

Working Standard - CLO4 INT

CLO4 INT		Description - 6850 Intermdt AccStd 10.ug/mL			
Standard: 49947		Created By: Thomas Bosch		Amount: 10 mL	
MFG: ALS/SLC		Create Date: 09/23/2019 03:09PM		Expires: 07/25/2020	
MFG Lot: TNB: 09/20/2019				Usable: Yes	
Pipette ID: Not Provided				Lab Lot: CLO4 INT	
Pos.	Analyte	Name	Concentration		
1	14797-73-0	Perchlorate	10 ug/mL		
2	14797-73-0-8385	Perchlorate 83:85 Ratio	10 ug/mL		
Composition					
Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
43659	CLO4 STOCK	6850 Stock AccStd 1,000ug/mL	CLO4 STOCK	0.1 mL	07/25/2020



STANDARD REPORT

Working Standard - CLO4 QC WRK

CLO4 QC WRK			Description - 6850 QC WKG STD 100ug/L		
Standard: 47516		Created By: Thomas Bosch		Amount: 10 mL	
MFG: ALS/SLC		Create Date: 05/06/2019 03:05PM		Expires: 03/31/2020	
MFG Lot: TNB: 05/06/2019				Usable: Yes	
Pipette ID: Not Provided				Lab Lot: CLO4 QC WRK 100.ug/L	
Pos.	Analyte	Name	Concentration		
1	14797-73-0	Perchlorate	100 ug/L		
Composition					
Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
47515	CLO4 QC INT	6850 QC Intrmdt Std-QC 10ug/mL	CLO4 QC INT 10.ug/mL	0.1 mL	03/31/2020



STANDARD REPORT

Constituent

Solvent Standard - ASTM H2O

ASTM H2O		Description - ASTM Type II Water	
Standard: 109	Created By: ALS Support (Lims)	Amount: 1000 L	
MFG: DCL In House	Create Date: 10/06/2005 09:10AM	Expires: 11/07/2025	
MFG Lot: Not Provided		Usable: Yes	
Part ID: Not Provided		Lab Lot: LAB 109	
Pos.	Analyte	Name	Concentration
Solvent - Analyte(s) not applicable			



STANDARD REPORT

Constituent

Stock Standard - CLO4 QCSTOCK

CLO4 QCSTOCK		Description - 6850 QC Stock STD 1,000ug/mL	
Standard: 36748	Created By: Thomas Bosch	Amount: 100 mL	
MFG: Ultra Scientific	Create Date: 05/11/2017 01:05PM	Expires: 03/31/2020	
MFG Lot: CP-0860		Usable: Yes	
Part ID: ICC-013		Lab Lot: CLO4 QC STOCK	
Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	1000 ug/mL



STANDARD REPORT

Constituent

Working Standard - CLO4 QC INT

CLO4 QC INT		Description - 6850 QC Intrmdt Std-QC 10ug/mL			
Standard: 47515		Created By: Thomas Bosch		Amount: 10 mL	
MFG: ALS/SLC		Create Date: 05/06/2019 03:05PM		Expires: 03/31/2020	
MFG Lot: TNB: 05/06/2019				Usable: Yes	
Pipette ID: Not Provided				Lab Lot: CLO4 QC INT 10.ug/mL	
Pos.	Analyte	Name			Concentration
1	14797-73-0	Perchlorate			10 ug/mL
Composition					
Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
36748	CLO4 QCSTOCK	6850 QC Stock STD 1,000ug/mL	CLO4 QC STOCK	0.1 mL	03/31/2020

125 Market Street
New Haven, CT 06513
USA



Tel (203)786-5290
Fax (203)786-5287
www.AccuStandard.com

CERTIFICATE OF ANALYSIS



43659

AccuTrace™ Reference Standard

Catalog No: IC-PER-10X-1
Description: Perchlorate Standard
Element: Perchlorate (ClO₄)
SRM: Ind. Std.
Lot: 218065075

Matrix: Water

Hazards: Refer to SDS for complete safety information

Date Certified: Jun 25, 2018

Expiration: Jul 25, 2020

Sample Size: 100 mL

Components: 1

Storage Condition: Ambient (>5 °C)

Included on ISO/IEC 17025 Scope of Accreditation: Yes

Included on ISO 17034 Scope of Accreditation: Yes



Signal Word: None

Component	SRM #	Prepared Concentration (µg/mL)
ClO ₄ Perchlorate	Ind. Std.	1000

The gravimetric uncertainty for this product is ±0.24%.

The final solution was checked against an independent standard to verify its concentration.

We use the highest purity raw materials available to minimize impurity levels in the final solution. Typically 99.999%+ pure starting materials are used as well as ASTM Type I 18 megohm deionized water.

All solutions are filtered through a 0.2 µm filter prior to being bottled.

All glassware used in preparation is Class A and calibrated regularly.

All weights are traceable through NIST; Test No. 822-275872-11

All bottles are triple rinsed with deionized water prior to use.

Shake bottle prior to use and do not pipette directly out of the bottle. Use only cleaned Class A volumetric glassware.

We certify the accuracy of this standard to be ±0.5% of the stated value until its expiration date provided it is kept tightly capped and stored under the conditions stated above.

Certified By:

Meigan O'Leary, Inorganic QC Manager

Page 1 of 1

For use in routine laboratory analysis.

AccuStandard is accredited to ISO 17034, ISO/IEC 17025 and certified to ISO 9001:2015

QR-ORG/INO-001
Rev. 5/18



Certificate of Analysis



ISO Guide 34 Reference Material

Product Number: ICC-013
Lot Number: CP-0860



Lot Issue Date: 29-Feb 2016
Expiration Date: 31-Mar 2020

Product Name: Perchlorate IC Standard

Description:

This Reference Material (RM) was gravimetrically prepared in accordance with ISO Guide 34 and under ULTRA Scientific's ISO 9001 registered quality system. The neat materials used for this product have been verified by ULTRA's ISO 17025 laboratory and under ULTRA's ISO Guide 34 accreditation. The analyte concentrations were verified by ULTRA's ISO 17025 accredited laboratory. For each analyte, the true value, with its uncertainty value calculated at the 95% confidence level, is reported below.

Analyte	Starting Material	Lot Number	Purity (%)	Calculated Value	True Value	Traceability & Method
perchlorate	potassium perchlorate	RM07987	100	1001 ± 5 µg/mL	976 ± 6 µg/mL	NIST SRM 3141A; ICP-OES

Solvent: water (low TOC, < 50 ppb)

Storage: Store at Room Temperature (15° to 30°C).

Traceability:

Traceability has been established through an unbroken chain of comparisons, each having stated uncertainties. Comparisons are based on appropriate physical or chemical measurements, including gravimetric or volumetric dilution, where the mass or volume of a solution before and after dilution is measured. The balances used for these measurements are calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1, ISO 9001, ISO 17025, and ISO Guide 34. Calibrated Class A glassware is used for volumetric measurements. Thermometers are calibrated against a NIST traceable thermometer in accordance with NIST Special Publication 819.

Estimation of Uncertainties:

The true value is reported, with its uncertainty value calculated at the 95% confidence level.

Homogeneity:

This RM was formulated and unitized according to an in-house procedure and is guaranteed to be homogeneous. There is no minimum sub-sample size required.

Intended Use:

This RM is intended for the preparation of working reference samples for use in routine laboratory analyses, calibration of instruments, validation of analytical methods, assessments of measurement methods and continuing calibration verification.

Instructions for Use:

Sample aliquots for analysis should be withdrawn at 20°C to 25°C immediately after opening and should be processed without delay for the true value to be valid within the stated uncertainties. Do not pipet from the bottle. Do not return any material removed for pipetting to the bottle. Tightly cap the bottle after removing any material and store according to the instructions noted above.

Hazards:

Refer to the Safety Data Sheet for information regarding this RM.

Expiration of Certification:

The certification of this RM is valid, within the measurement uncertainty specified, until the expiration date specified above, provided the RM is handled and stored in accordance with the instructions given in this certificate. This certification is nullified if the RM is damaged, contaminated, or otherwise modified.



ISO 9001 Registered Quality System – TUV USA

Page 1 of 2



Certificate of Analysis



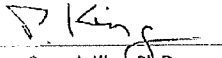
ISO Guide 34 Reference Material

Product Number: ICC-013
 Lot Number: CP-0860

Lot Issue Date: 29-Feb 2016
 Expiration Date: 31-Mar 2020

Maintenance of Certification:

The real-time, long term stability of the RM may be monitored over the lifetime of the certification. If substantive changes occur that affect the certification before the expiration of this certificate, ULTRA Scientific will notify the purchaser.


 Peter A. King, Ph.D.
 VP, Technical Operations


 Daniel J. Lamendola
 Director of QA/RA



ISO 9001 Registered Quality System – TUV USA

Page 2 of 2



Cambridge Isotope Laboratories, Inc.

Certificate of Analysis



Product Name: PERCHLORIC ACID, SODIUM SALT
(Isotopic Label & Enrichment Specification) (18O4, 90%+) 100 UG/ML IN WATER

Lot Number: SDIH-016

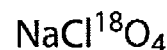
Catalog Number: OLM-7310-S

Product Information

Chemical Purity Specification: $\geq 98\%$

MW*: 130.44
* For isotopically labeled compounds, MW listed is for the fully enriched product.

Labeled CAS Number: NA



Unlabeled CAS Number: 7601-89-0

Chemical Formula: NaCl*O4

Storage: Store at room temperature away from light and moisture.

Stability: See storage and expiration date.

Certification

Cambridge Isotope Laboratories, Inc. guarantees that this material meets or exceeds the specifications stated. Absolute identity as well as chemical and isotopic purities are assured by the use of unambiguous synthetic routes and multiple chemical analyses whenever possible. Results are representative of QC testing at time of release from Quality Control unless otherwise stated. CIL Certificates of Analysis are occasionally updated with new data following recertification. We recommend checking the website for the latest version.

Volumetric measurements were made with Class A glassware. Gravimetry is traceable to the NIST through calibrated balances and certified, calibrated, standard weights. The calibrations are traceable to the NIST under Test No. 822/270236-04. The calibrations also meet specifications outlined in ISO 9001, ISO/IEC 17025, ANSI/NSCL Z540-1-1994, NCR Document 10CFR50 Appendix B, and applicable subdocuments.

This COA references the bulk catalog number before packaging. The COA also applies to the CIL finished good catalog number. Some possible packaging sizes and their corresponding suffix are -1.2, -1, -0.5, -10, or -0.1.

Approved by: Sashi Sivendran-Basak

Sashi Sivendran-Basak, Ph.D., Quality Review

Quality Control Tests and Results

QC Release Date	12/05/2018
Expiration Date	12/05/2028
Concentration Based on Gravimetry	100.0 \pm 1.0 $\mu\text{g/mL}$ (k=2)
Chemical Purity of Neat Material(s)	98%
LC/MS for Concentration	105.4 \pm 1.1 $\mu\text{g/mL}$ (k=2)



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Batch Review Method:

C:\HPCHEM\1\METHODS\CLO4-DP3.M

['#'] ==> Run has not been reprocessed with Batch Review Method
 ['*'] ==> Run has been saved with batch file]

#*	Sample	Location	Inj	SampleType	Run	Perchlorate Area	Perchlorate RT	Perchlorate Amount	
#*	689521	CCV@25	Vial 71	1	Control	1	1.76473e6	7.347	27.49761
#*	689522	QC@3.0	Vial 72	1	Control	2	1.95559e5	7.165	3.20494
#*	689524	ICS@3.0	Vial 73	1	Control	3	1.44963e5	7.209	3.09759
#*	689525	LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
#*	1935345001		Vial 75	1	Sample	5	0.00000	0.000	0.00000
#*	1935345002		Vial 76	1	Sample	6	0.00000	0.000	0.00000
#*	1935345003		Vial 77	1	Sample	7	0.00000	0.000	0.00000
#*	1935345004		Vial 78	1	Sample	8	8.68794e4	6.933	4.62865
#*	1935345005		Vial 79	1	Sample	9	0.00000	0.000	0.00000
#*	1935345006	100	Vial 80	1	Sample	10	6.85819e5	7.544	1037.77002
#*	1935345007	1K	Vial 81	1	Sample	11	8.48401e5	7.592	1.49867e4
#*	1935345008	10K	Vial 82	1	Sample	12	5.01021e5	7.605	7.31745e4
#*	1935345009	10K	Vial 83	1	Sample	13	4.88880e5	7.614	7.95989e4
#*	1935345010	100	Vial 84	1	Sample	14	1.07600e6	7.601	1802.14414
#*	689414	CCV@25	Vial 71	1	Control	15	1.91095e6	7.461	26.99793
#*	1935347001	1K	Vial 85	1	Sample	16	8.33844e5	7.559	1.27519e4
#*	1935347002	1K	Vial 86	1	Sample	17	9.01055e5	7.560	1.32403e4
#*	1935347003	10X	Vial 87	1	Sample	18	1.33576e6	7.434	207.38479
#*	1935347006		Vial 90	1	Sample	21	3.37508e4	7.329	5.41444e-1 <R/L
#*	1935347007		Vial 91	1	Sample	22	5.21433e5	7.284	9.08369
#*	1935366001		Vial 92	1	Sample	23	3.55813e4	7.225	5.16725e-1 <R/L
#*	1935345003	5X	Vial 93	1	Sample	24	0.00000	0.000	0.00000
#*	1935345004	5X	Vial 94	1	Sample	25	1.12395e5	7.263	10.79582
#*	689415	CCV@25	Vial 71	1	Control	26	1.67312e6	7.458	25.55981
#*	1935347004	MS	Vial 97	1	Sample	29	1.64083e6	7.401	249.90057
#*	1935347005	MSD	Vial 98	1	Sample	30	1.58965e6	7.448	251.12094
#*	1935345003	2X	Vial 99	1	Sample	31	0.00000	0.000	0.00000 ✓
#*	1935345004	2X	Vial 100	1	Sample	32	9.76137e4	7.136	5.83827-N.R.
*	689664	CCV@25	Vial 71	1	Control	33	1.57878e6	7.452	26.31908

N.R. NOT REPORTED/SAMPLE FAILS 83/85 RATIO AT 2x DIL'N

#*	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-ISTD RT	CLO4-89-ISTD Amount	
#*	689521	CCV@25	Vial 71	1	Control	1	2.17048e5	7.361	5.00000
#*	689522	QC@3.0	Vial 72	1	Control	2	2.24689e5	7.181	5.00000
#*	689524	ICS@3.0	Vial 73	1	Control	3	1.72263e5	7.224	5.00000
#*	689525	LMB	Vial 74	1	Control	4	2.13087e5	7.315	5.00000
#*	1935345001		Vial 75	1	Sample	5	2.38355e5	7.341	5.00000
#*	1935345002		Vial 76	1	Sample	6	2.83691e5	7.337	5.00000
#*	1935345003		Vial 77	1	Sample	7	8.98345e4	7.060	5.00000
#*	1935345004		Vial 78	1	Sample	8	6.92035e4	6.968	5.00000
#*	1935345005		Vial 79	1	Sample	9	1.93530e5	7.330	5.00000
#*	1935345006	100	Vial 80	1	Sample	10	2.39667e5	7.568	500.00000
#*	1935345007	1K	Vial 81	1	Sample	11	2.01594e5	7.615	5000.00000
#*	1935345008	10K	Vial 82	1	Sample	12	2.50964e5	7.629	5.00000e4
#*	1935345009	10K	Vial 83	1	Sample	13	2.24661e5	7.632	5.00000e4
#*	1935345010	100	Vial 84	1	Sample	14	2.09987e5	7.626	500.00000
#*	689414	CCV@25	Vial 71	1	Control	15	2.39873e5	7.482	5.00000
#*	1935347001	1K	Vial 85	1	Sample	16	2.34965e5	7.574	5000.00000
#*	1935347002	1K	Vial 86	1	Sample	17	2.44063e5	7.574	5000.00000
#*	1935347003	10X	Vial 87	1	Sample	18	2.23994e5	7.454	50.00000
#*	1935347006		Vial 90	1	Sample	21	2.06441e5	7.338	5.00000
#*	1935347007		Vial 91	1	Sample	22	2.09169e5	7.305	5.00000
#*	1935366001		Vial 92	1	Sample	23	2.26617e5	7.284	5.00000
#*	1935345003	5X	Vial 93	1	Sample	24	1.80510e5	7.124	25.00000
#*	1935345004	5X	Vial 94	1	Sample	25	1.90269e5	7.289	25.00000
#*	689415	CCV@25	Vial 71	1	Control	26	2.23153e5	7.477	5.00000

Batch Report: C:\HPCHEM\1\DATA\23DEC19D\23DEC19S.B

#*	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
#*	1935347004	MS	Vial 97	1	Sample	2.24361e5	7.419	50.00000
#*	1935347005	MSD	Vial 98	1	Sample	2.16198e5	7.469	50.00000
#*	1935345003	2X	Vial 99	1	Sample	1.59557e5	7.169	10.00000
#*	1935345004	2X	Vial 100	1	Sample	1.22992e5	7.153	10.00000
*	689664	CCV@25	Vial 71	1	Control	2.03857e5	7.479	5.00000

#*	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
#*	689521	CCV@25	Vial 71	1	Control	5.21339e5	7.363	26.74056
#*	689522	QC@3.0	Vial 72	1	Control	6.37839e4	7.182	3.33823
#*	689524	ICS@3.0	Vial 73	1	Control	5.30412e4	7.216	3.63016
#*	689525	LMB	Vial 74	1	Control	0.00000	0.000	0.00000
#*	1935345001		Vial 75	1	Sample	0.00000	0.000	0.00000
#*	1935345002		Vial 76	1	Sample	0.00000	0.000	0.00000
#*	1935345003		Vial 77	1	Sample	0.00000	0.000	0.00000
#*	1935345004		Vial 78	1	Sample	4.19271e4	6.950	7.19033
#*	1935345005		Vial 79	1	Sample	0.00000	0.000	0.00000
#*	1935345006	100	Vial 80	1	Sample	2.00419e5	7.565	987.24143
#*	1935345007	1K	Vial 81	1	Sample	2.50754e5	7.612	1.44793e4
#*	1935345008	10K	Vial 82	1	Sample	1.44992e5	7.619	6.85893e4
#*	1935345009	10K	Vial 83	1	Sample	1.42326e5	7.621	7.51552e4
#*	1935345010	100	Vial 84	1	Sample	3.22493e5	7.617	1767.87343
#*	689414	CCV@25	Vial 71	1	Control	5.66704e5	7.478	26.34088
#*	1935347001	1K	Vial 85	1	Sample	2.43643e5	7.576	1.21619e4
#*	1935347002	1K	Vial 86	1	Sample	2.68208e5	7.574	1.28608e4
#*	1935347003	10X	Vial 87	1	Sample	3.97796e5	7.446	202.52947
#*	1935347006		Vial 90	1	Sample	1.30256e4	7.346	6.21224e-1
#*	1935347007		Vial 91	1	Sample	1.79359e5	7.298	10.11684
#*	1935366001		Vial 92	1	Sample	1.40576e4	7.237	6.07978e-1
#*	1935345003	5X	Vial 93	1	Sample	0.00000	0.000	0.00000
#*	1935345004	5X	Vial 94	1	Sample	4.28598e4	7.292	13.11553
#*	689415	CCV@25	Vial 71	1	Control	5.03085e5	7.471	25.23942
#*	1935347004	MS	Vial 97	1	Sample	4.75546e5	7.418	238.52283
#*	1935347005	MSD	Vial 98	1	Sample	4.64978e5	7.463	241.73838
#*	1935345003	2X	Vial 99	1	Sample	0.00000	0.000	0.00000
#*	1935345004	2X	Vial 100	1	Sample	4.40685e4	7.140	8.47992
*	689664	CCV@25	Vial 71	1	Control	4.78132e5	7.471	26.16731

*** End of Report ***

Sequence Table:

Method and Injection Info Part:

Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
====	=====	=====	=====	===	=====	=====	=====
1	Vial 71	689521	CCV@25	CLO4-AQN	1	Ctrl Samp	
2	Vial 72	689522	QC@3.0	CLO4-AQN	1	Ctrl Samp	
3	Vial 73	689524	ICS@3.0	CLO4-AQN	1	Ctrl Samp	
4	Vial 74	689525	LMB	CLO4-AQN	1	Ctrl Samp	
5	Vial 75	1935345001		CLO4-AQN	1	Sample	
6	Vial 76	1935345002		CLO4-AQN	1	Sample	
7	Vial 77	1935345003		CLO4-AQN	1	Sample	
8	Vial 78	1935345004		CLO4-AQN	1	Sample	
9	Vial 79	1935345005		CLO4-AQN	1	Sample	
10	Vial 80	1935345006	100	CLO4-AQN	1	Sample	
11	Vial 81	1935345007	1K	CLO4-AQN	1	Sample	
12	Vial 82	1935345008	10K	CLO4-AQN	1	Sample	
13	Vial 83	1935345009	10K	CLO4-AQN	1	Sample	
14	Vial 84	1935345010	100	CLO4-AQN	1	Sample	
15	Vial 71	689414	CCV@25	CLO4-AQN	1	Ctrl Samp	
16	Vial 85	1935347001	1K	CLO4-AQN	1	Sample	
17	Vial 86	1935347002	1K	CLO4-AQN	1	Sample	
18	Vial 87	1935347003	10X	CLO4-AQN	1	Sample	
19	Vial 88	1935347004	MS	CLO4-AQN	1	Sample	
20	Vial 89	1935347005	MSD	CLO4-AQN	1	Sample	
21	Vial 90	1935347006		CLO4-AQN	1	Sample	
22	Vial 91	1935347007		CLO4-AQN	1	Sample	
23	Vial 92	1935366001		CLO4-AQN	1	Sample	
24	Vial 93	1935345003	5X	CLO4-AQN	1	Sample	
25	Vial 94	1935345004	5X	CLO4-AQN	1	Sample	
26	Vial 71	689415	CCV@25	CLO4-AQN	1	Ctrl Samp	
27	Vial 95	1935347004	NoSpk	CLO4-AQN	1	Sample	
28	Vial 96	1935347005	NoSpk	CLO4-AQN	1	Sample	
29	Vial 97	1935347004	MS	CLO4-AQN	1	Sample	
30	Vial 98	1935347005	MSD	CLO4-AQN	1	Sample	
31	Vial 99	1935345003	2X	CLO4-AQN	1	Sample	
32	Vial 100	1935345004	2X	CLO4-AQN	1	Sample	
33	Vial 71	689664	CCV@25	CLO4-AQN	1	Ctrl Samp	

Data file: C:\HPCHEM\1\DATA\23DEC19D\23DECD01.D

Sample Name: 689521 CCV@25

Injection Date: 12/23/2019 08:09:10

Seq Line: 1

Sample Name: 689521 CCV@25

Location: Vial 71

Acq Operator: TNB

Inj. No.: 1

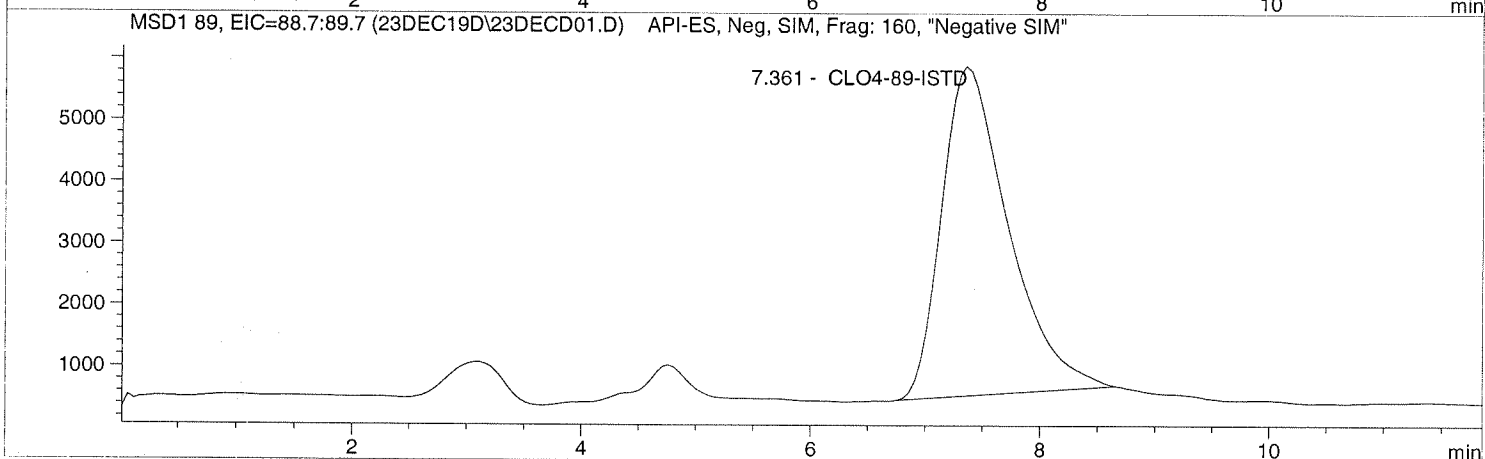
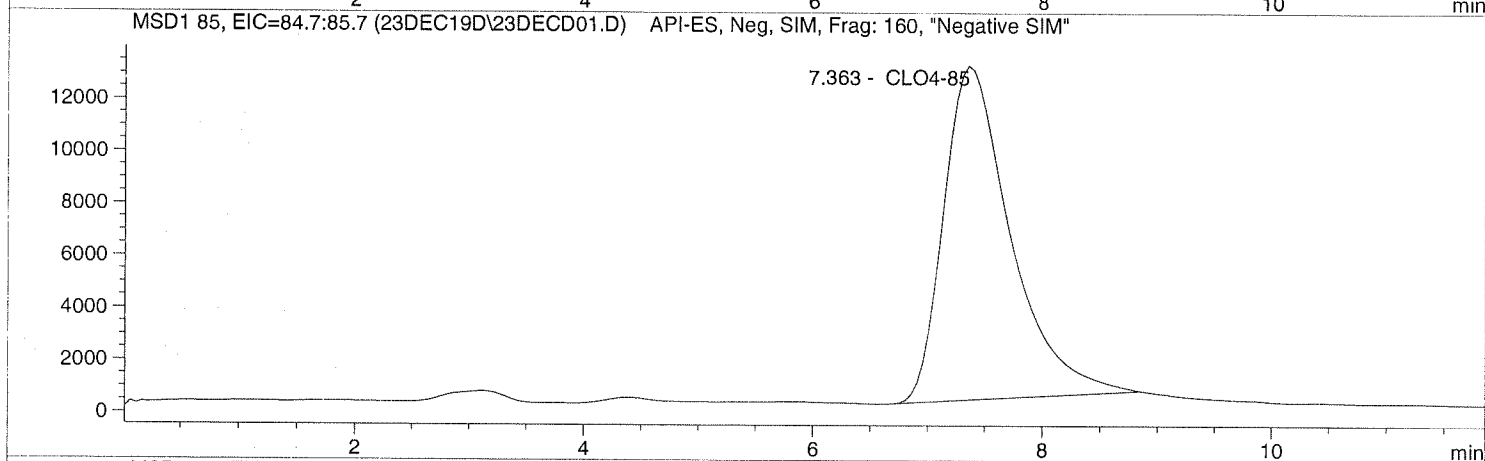
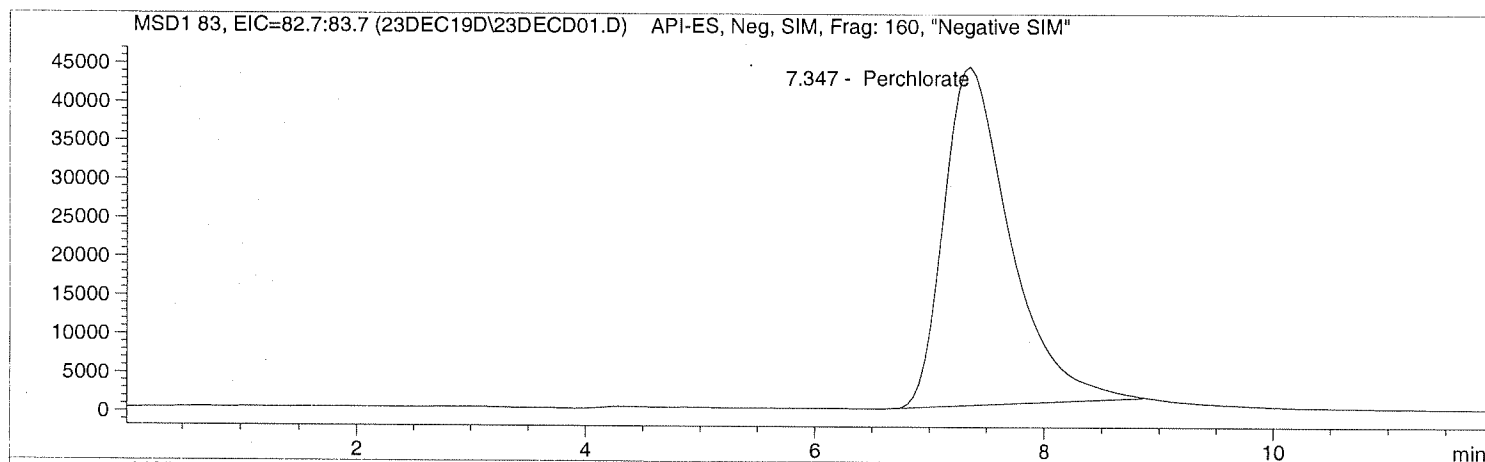
Inj. Vol.: 35 μ l

Acq. Method: CLO4-AQN.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M

Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23DEC19D\23DECD01.D Sample Name: 689521 CCV@25

Injection Date: 12/23/2019 08:09:10 Seq Line: 1
 Sample Name: 689521 CCV@25 Location: Vial 71
 Acq Operator: TNB Inj. No.: 1
 Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M
 Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
 Last Changed: 11/5/2019 08:44:45

Perchlorate analysis

Sample Information

Sorted By: Signal
 Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
 Multiplier: 1.000000
 Dilution: 1.000000
 Sample Amount: 25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.347	PBA	1764733.7	27.4976	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.363	PBA	521339.0	26.7406	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.361	PBA	217048.4	5.0000	CLO4-89-ISTD

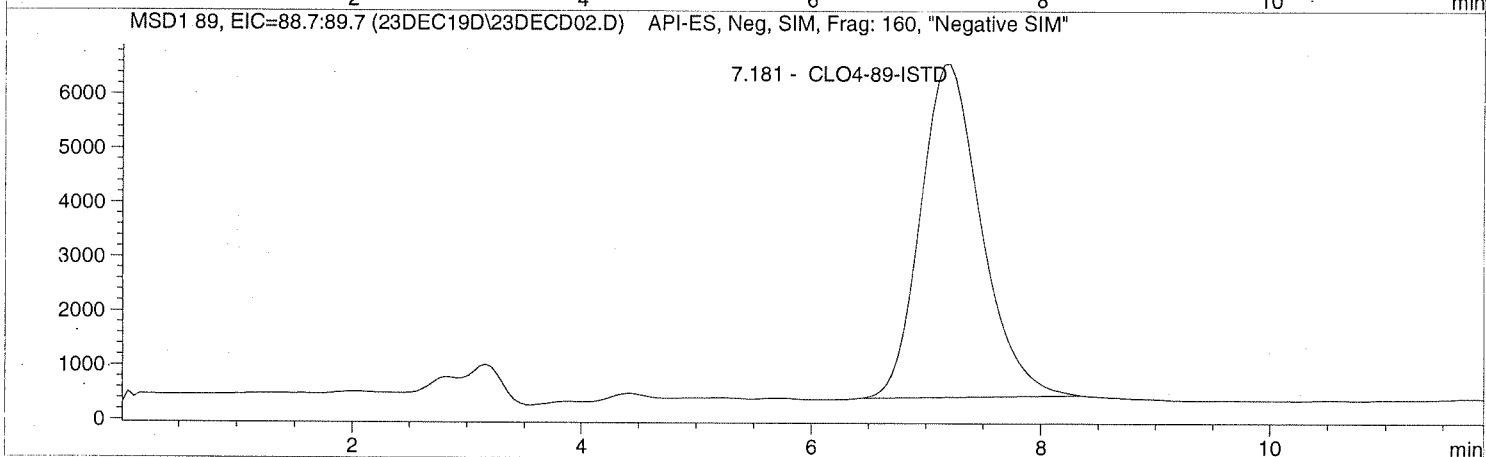
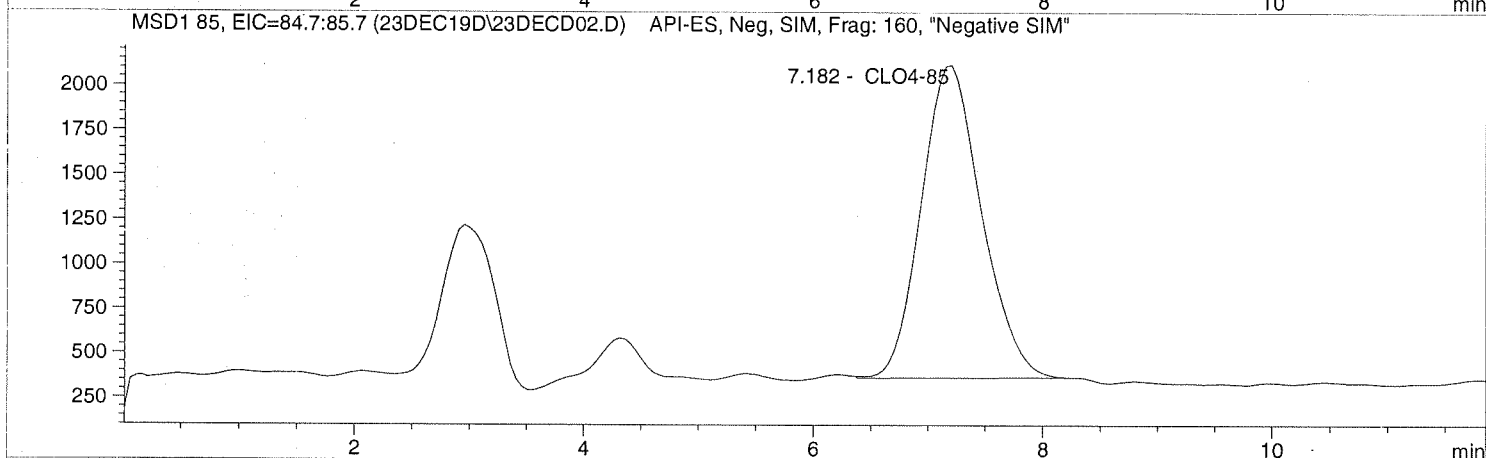
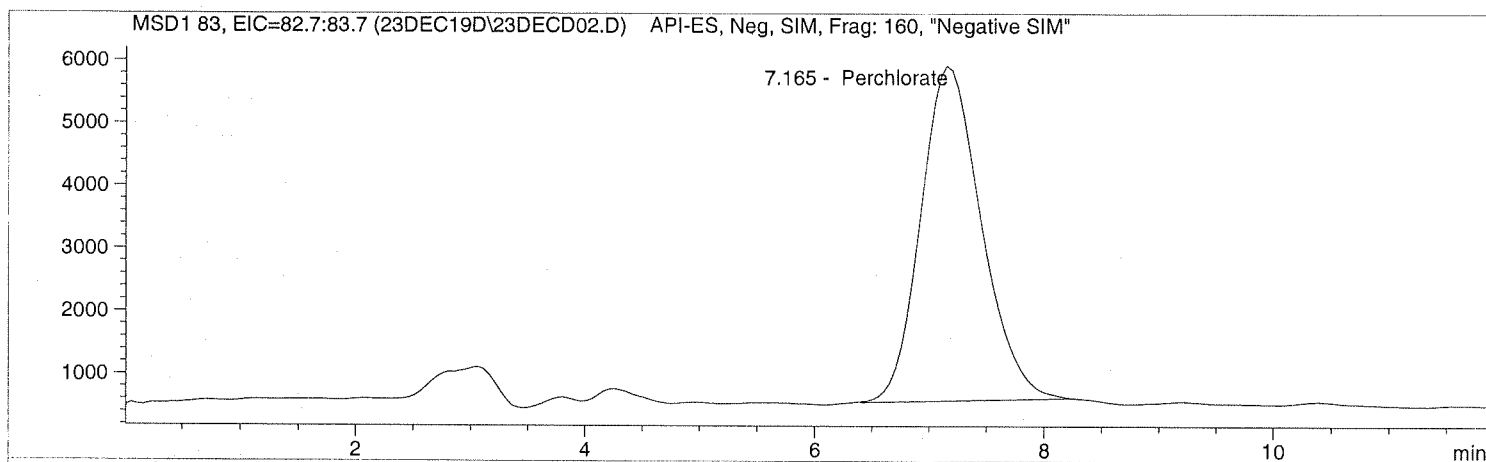
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\23DEC19D\23DEC19D02.D Sample Name: 689522 QC@3.0

```
=====
Injection Date: 12/23/2019 08:25:30      Seq Line: 2
Sample Name: 689522 QC@3.0              Location: Vial 72
Acq Operator: TNB                       Inj. No.: 1
                                           Inj. Vol.: 35 µl
=====
```

```
Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45
```

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23DEC19D\23DECD02.D Sample Name: 689522 QC@3.0

```

=====
Injection Date: 12/23/2019 08:25:30      Seq Line:          2
Sample Name:    689522 QC@3.0            Location:          Vial 72
Acq Operator:   TNB                      Inj. No.:         1
                                           Inj. Vol.:        35 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  3.000
=====

```

```

=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.165	BBA	195559.3	3.2049	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.182	BBA	63783.9	3.3382	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.181	BBA	224689.5	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

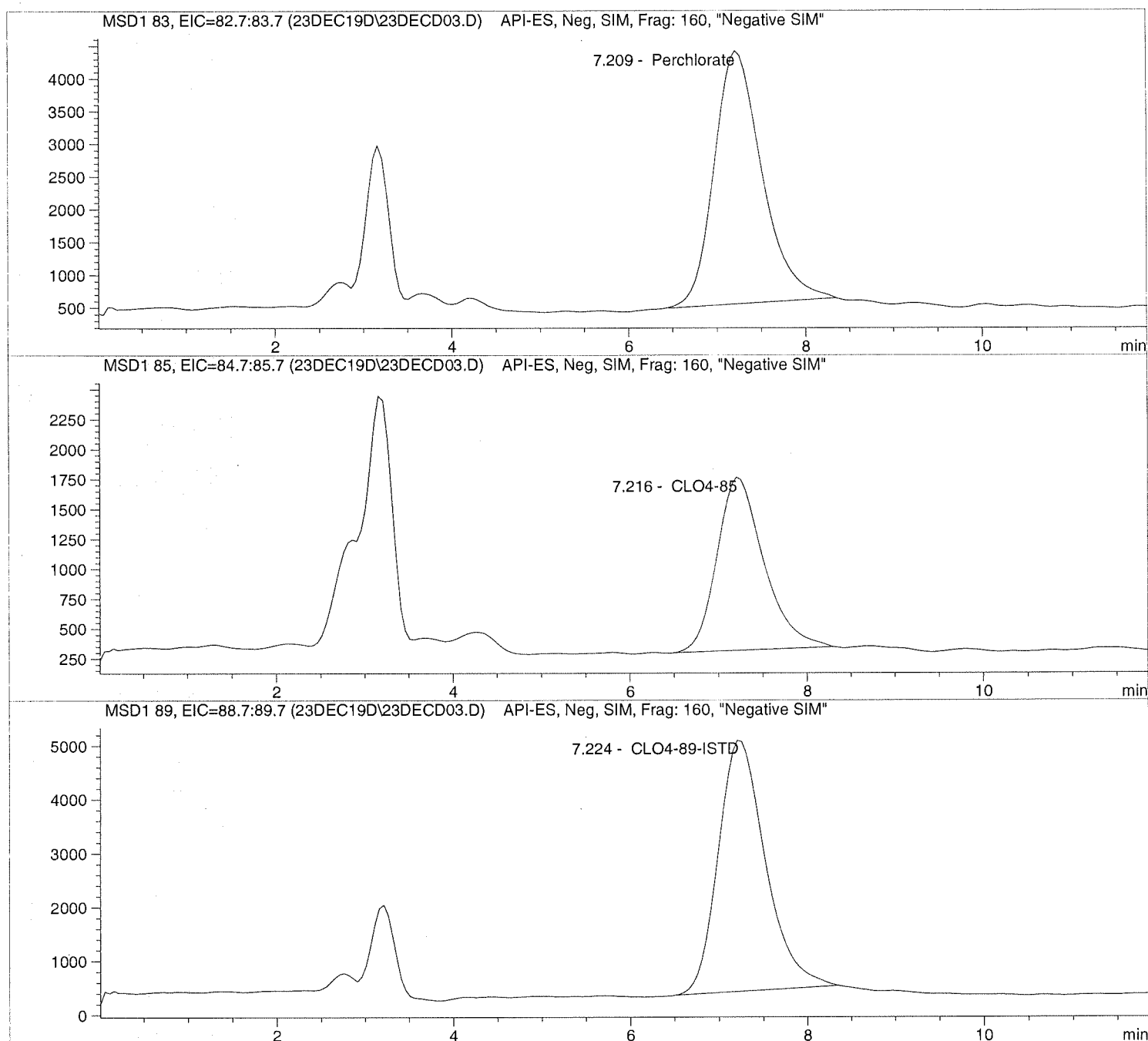
```

Data file: C:\HPCHEM\1\DATA\23DEC19D\23DECD03.D Sample Name: 689524 ICS@3.0

```
=====
Injection Date: 12/23/2019 08:39:24      Seq Line: 3
Sample Name: 689524 ICS@3.0              Location: Vial 73
Acq Operator: TNB                          Inj. No.: 1
                                           Inj. Vol.: 35 µl
=====
```

```
Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45
```

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23DEC19D\23DECD03.D Sample Name: 689524 ICS@3.0

```

=====
Injection Date: 12/23/2019 08:39:24      Seq Line:          3
Sample Name:    689524 ICS@3.0           Location:         Vial 73
Acq Operator:   TNB                      Inj. No.:        1
                                           Inj. Vol.:       35 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  3.000
=====

```

```

=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.209	BBA	144963.1	3.0976	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.216	PBA	53041.2	3.6302	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.224	PBA	172262.7	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```


Data file: C:\HPCHEM\1\DATA\23DEC19D\23DECD04.D

Sample Name: 689525 LMB

Injection Date: 12/23/2019 08:53:18

Seq Line: 4

Sample Name: 689525 LMB

Location: Vial 74

Acq Operator: TNB

Inj. No.: 1

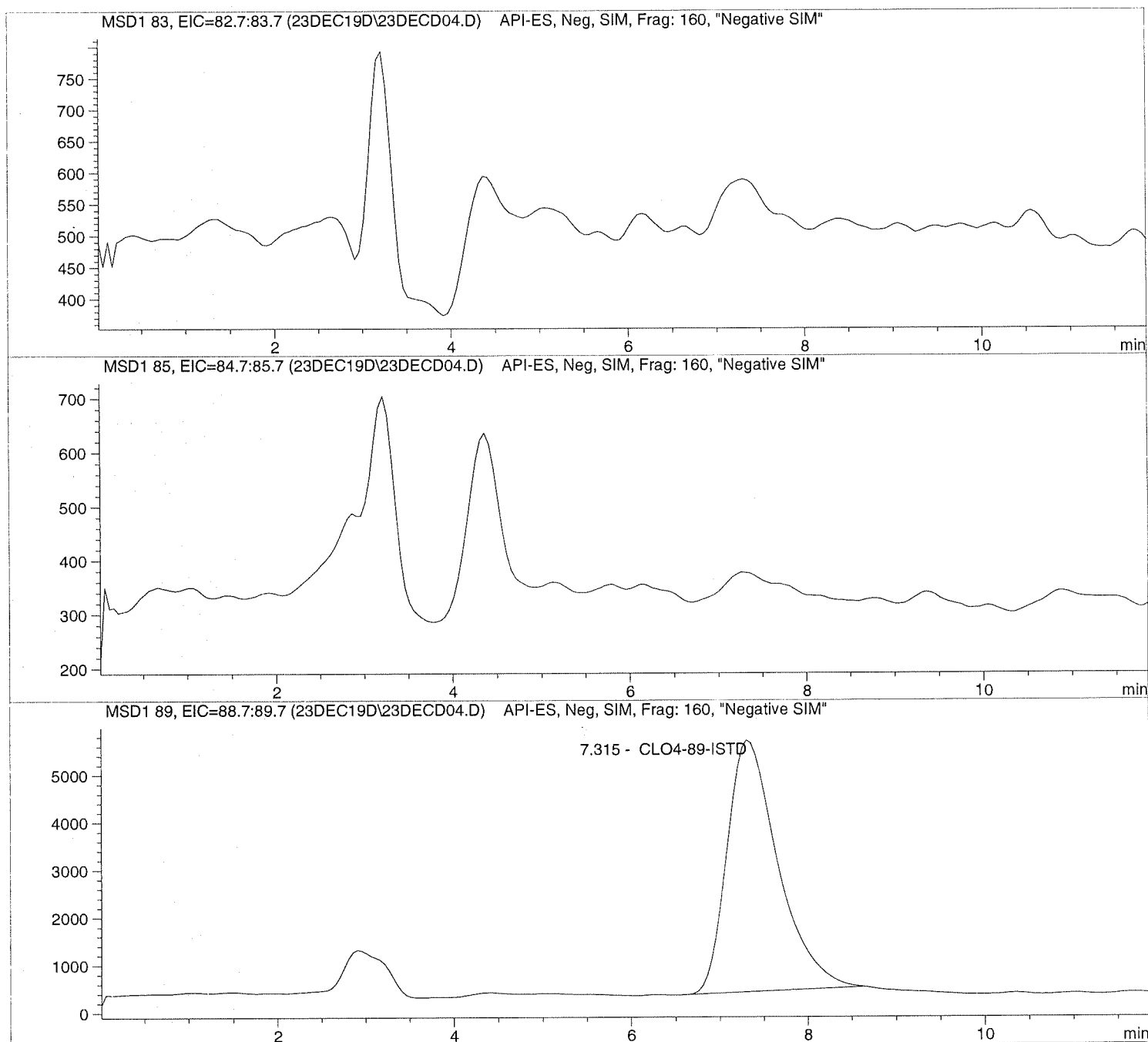
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M

Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23DEC19D\23DEC04.D Sample Name: 689525 LMB

```

=====
Injection Date: 12/23/2019 08:53:18      Seq Line:          4
Sample Name:    689525 LMB                Location:          Vial 74
Acq Operator:   TNB                      Inj. No.:         1
                                           Inj. Vol.:        35 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  0.000
=====

```

```

=====
                          LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.315	PBA	213086.9	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\23DEC19D\23DECD05.D

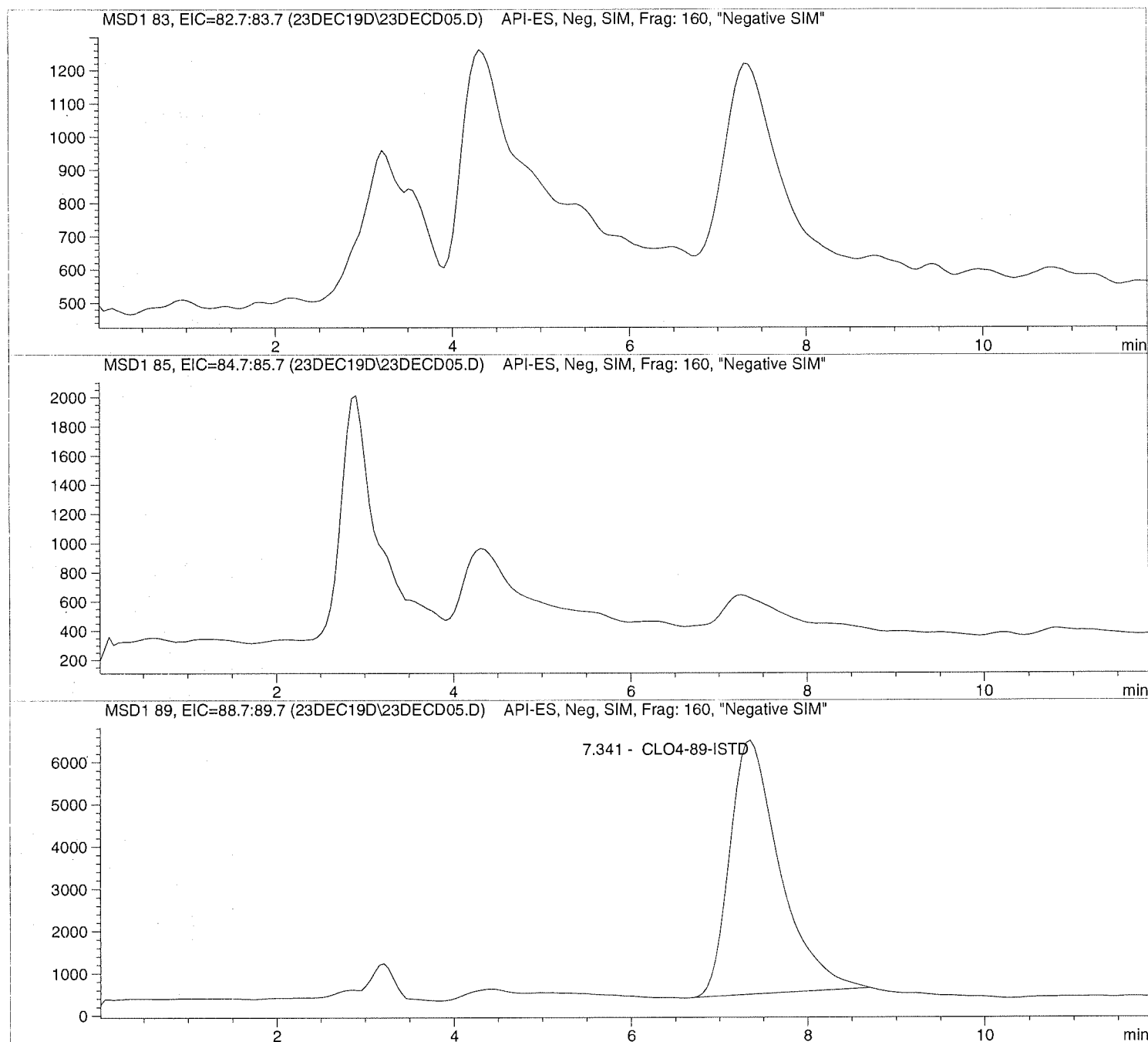
Sample Name: 1935345001

Injection Date: 12/23/2019 09:07:14
Sample Name: 1935345001
Acq Operator: TNB

Seq Line: 5
Location: Vial 75
Inj. No.: 1
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23DEC19D\23DECD05.D Sample Name: 1935345001

```

=====
Injection Date: 12/23/2019 09:07:14      Seq Line:      5
Sample Name:   1935345001                Location:      Vial 75
Acq Operator:  TNB                       Inj. No.:     1
                                           Inj. Vol.:    35 µl
=====

```

```

Acq. Method:   CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:  11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:    1.000000
Dilution:      1.000000
Sample Amount: 0.000
=====

```

```

=====
                          LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.341	PBA	238355.3	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\23DEC19D\23DECD06.D

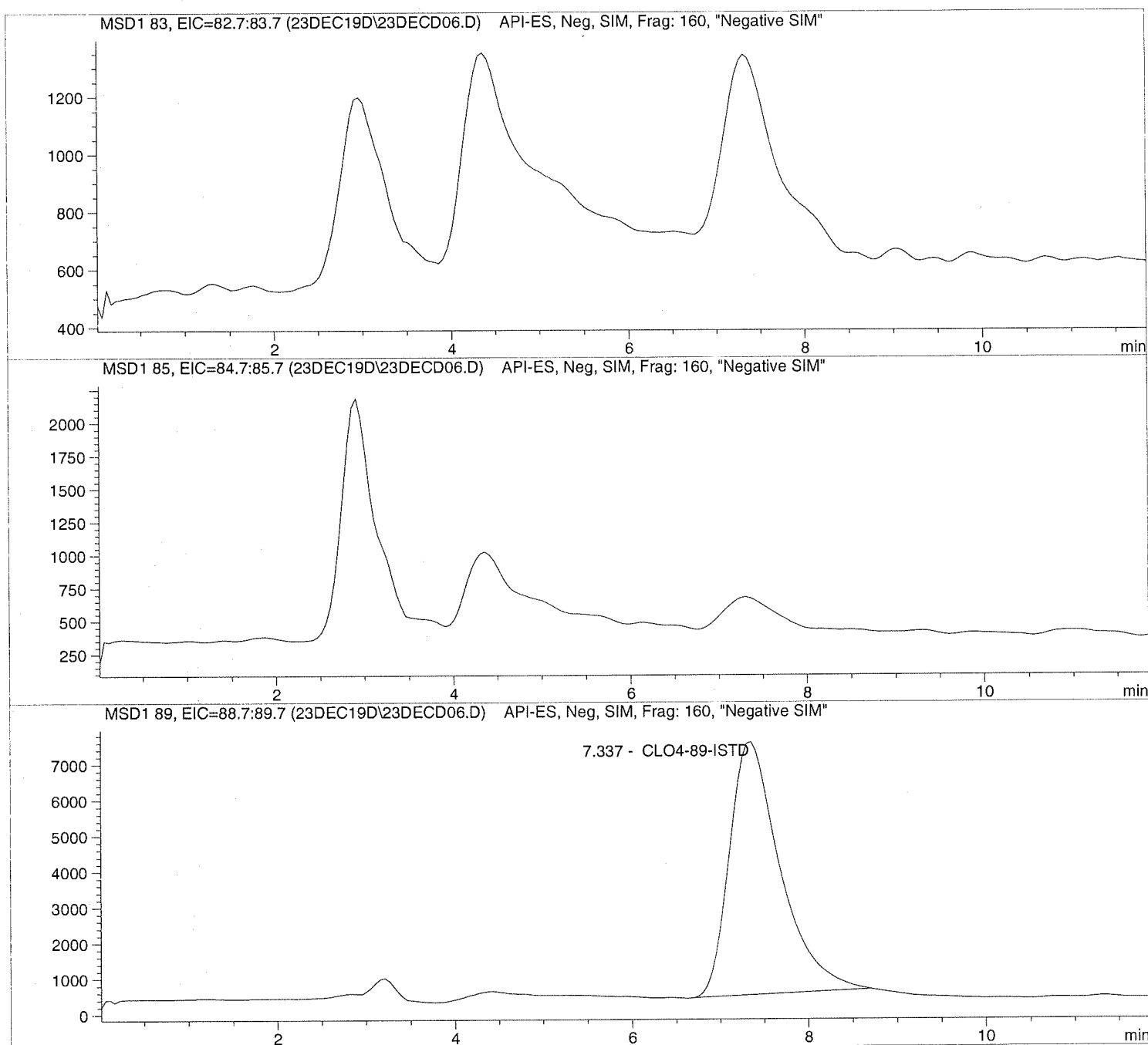
Sample Name: 1935345002

=====
Injection Date: 12/23/2019 09:21:10
Sample Name: 1935345002
Acq Operator: TNB

Seq Line: 6
Location: Vial 76
Inj. No.: 1
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23DEC19D\23DECD06.D Sample Name: 1935345002

```

=====
Injection Date: 12/23/2019 09:21:10      Seq Line: 6
Sample Name: 1935345002                  Location: Vial 76
Acq Operator: TNB                        Inj. No.: 1
                                           Inj. Vol.: 35 µl
=====

```

```

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By: Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 0.000
=====

```

```

=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.337	PBA	283690.6	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

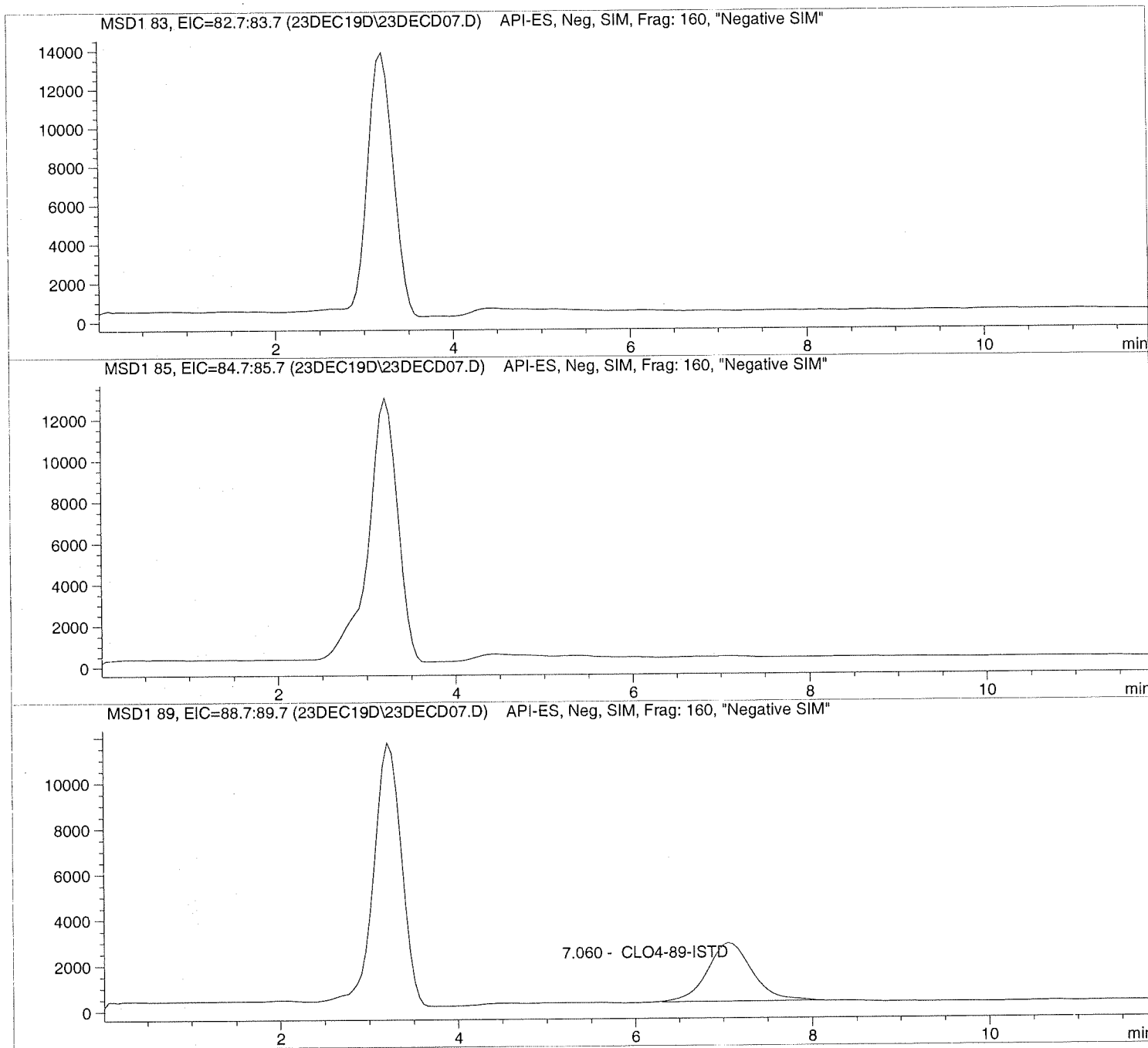
```

Injection Date: 12/23/2019 09:35:04
Sample Name: 1935345003
Acq Operator: TNB

Seq Line: 7
Location: Vial 77
Inj. No.: 1
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



```
=====  
Injection Date: 12/23/2019 09:35:04      Seq Line: 7  
Sample Name: 1935345003                  Location: Vial 77  
Acq Operator: TNB                        Inj. No.: 1  
                                           Inj. Vol.: 35 µl
```

```
Acq. Method: CLO4-AQN.M  
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M  
Last Changed: 11/5/2019 08:44:45
```

Perchlorate analysis

=====
Sample Information
=====

```
Sorted By: Signal  
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm  
Multiplier: 1.000000  
Dilution: 1.000000  
Sample Amount: 0.000
```

=====
LCMS Results
=====

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.060	BBA	89834.5	5.0000	CLO4-89-ISTD

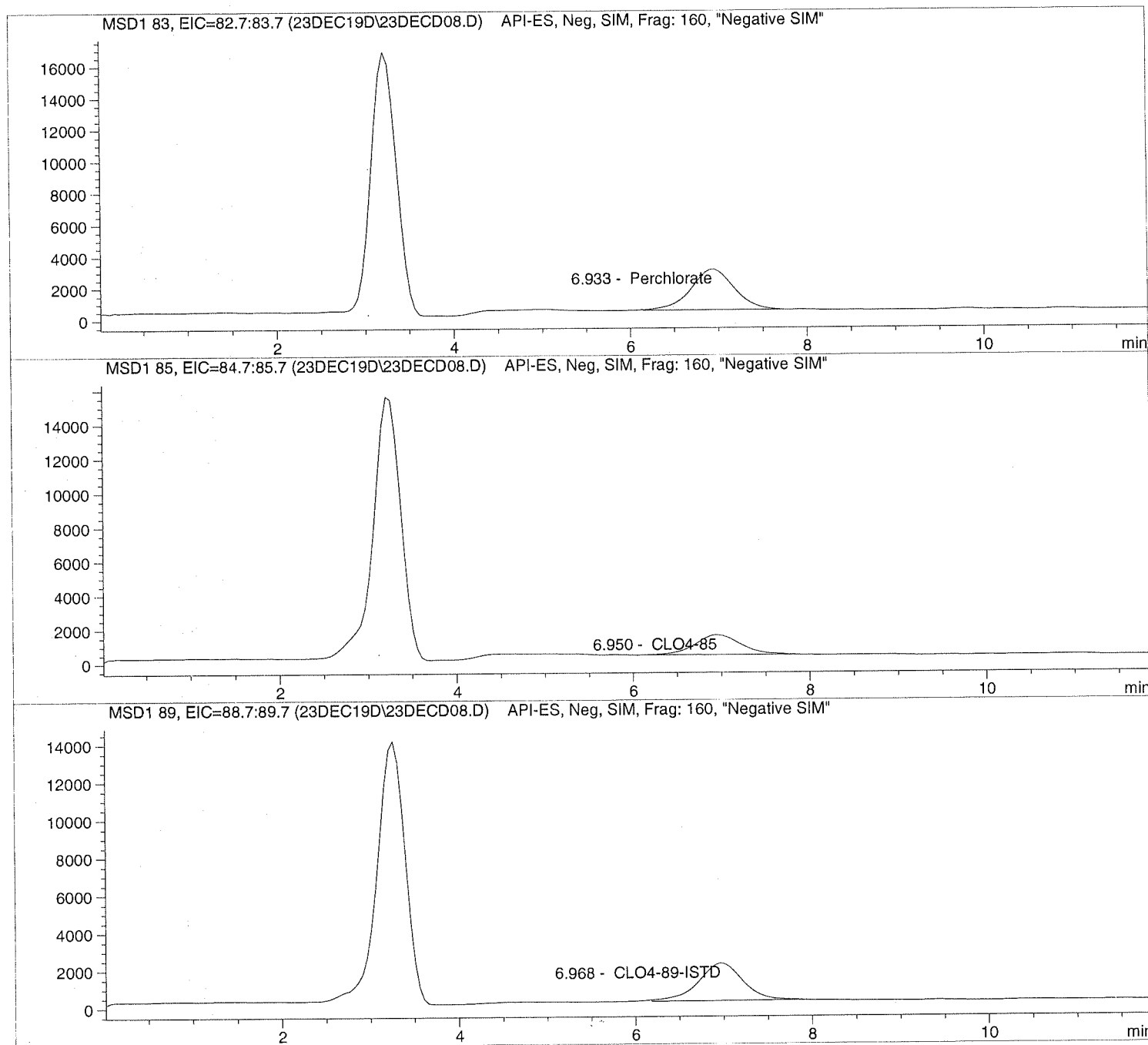
=====
*** End of Report ***

Injection Date: 12/23/2019 09:48:56
Sample Name: 1935345004
Acq Operator: TNB

Seq Line: 8
Location: Vial 78
Inj. No.: 1
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



```
=====
Injection Date: 12/23/2019 09:48:56      Seq Line:      8
Sample Name:    1935345004                Location:      Vial 78
Acq Operator:   TNB                       Inj. No.:     1
                                           Inj. Vol.:    35 µl
=====
```

```
Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   11/5/2019 08:44:45
=====
```

Perchlorate analysis

===== Sample Information =====

```
Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  0.000
=====
```

===== LCMS Results =====

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.933	BBA	86879.4	4.6286	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.950	PBA	41927.1	7.1903	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.968	BBA	69203.5	5.0000	CLO4-89-ISTD

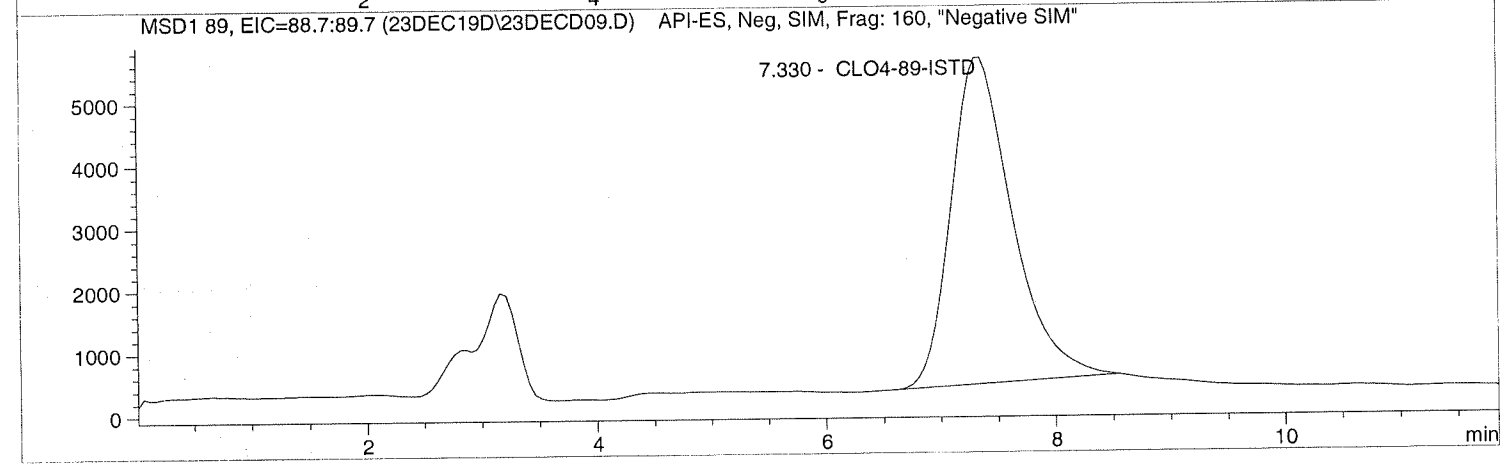
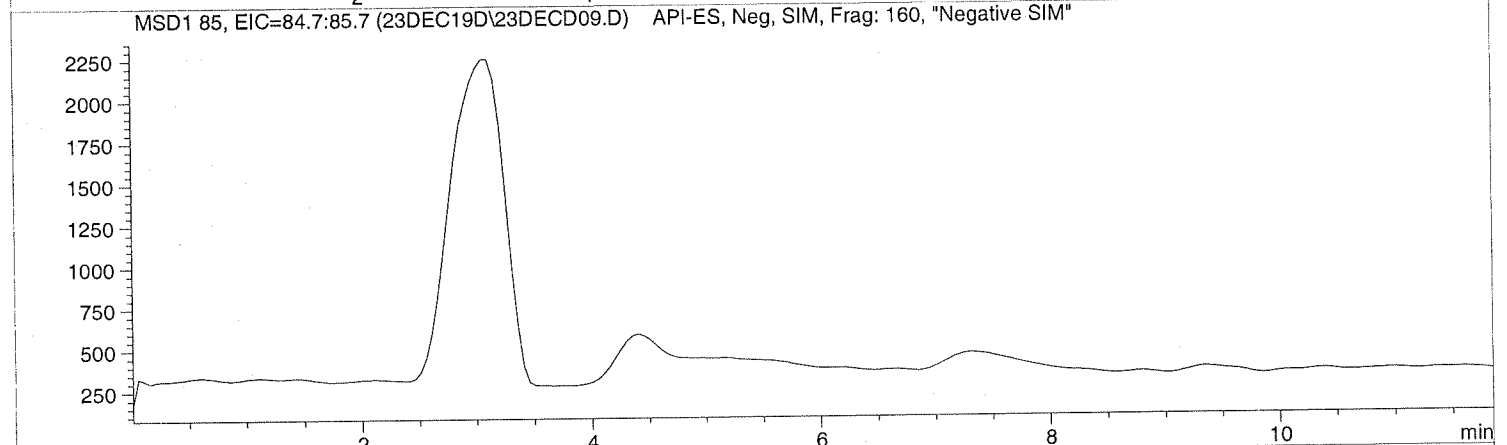
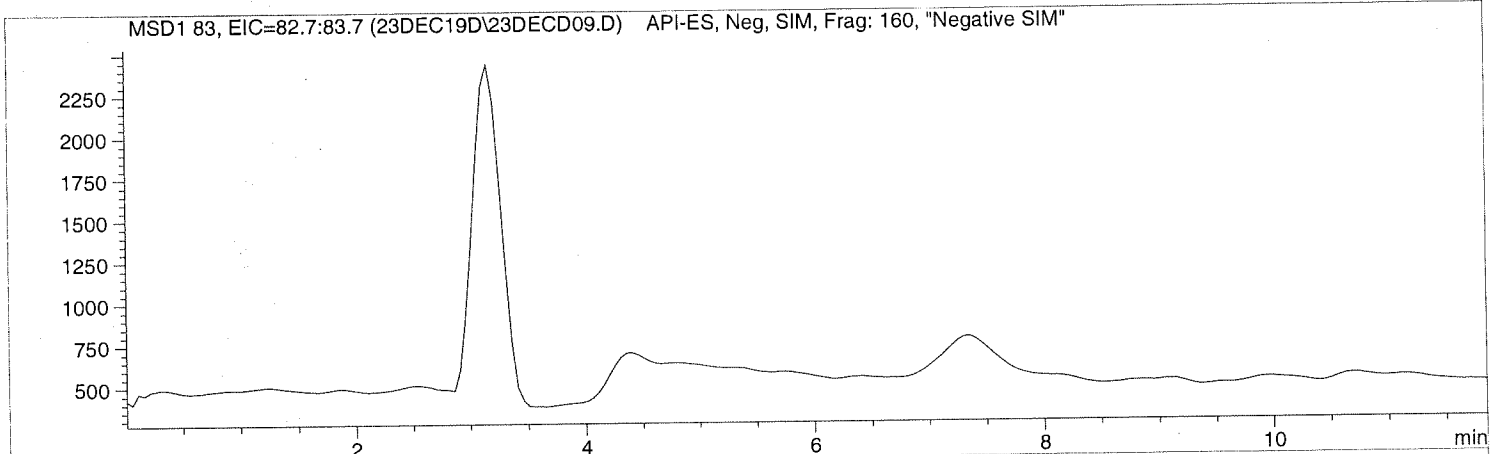
=====
*** End of Report ***

Injection Date: 12/23/2019 10:02:49
Sample Name: 1935345005
Acq Operator: TNB

Seq Line: 9
Location: Vial 79
Inj. No.: 1
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



```
=====
Injection Date: 12/23/2019 10:02:49      Seq Line:          9
Sample Name:    1935345005                Location:          Vial 79
Acq Operator:   TNB                       Inj. No.:         1
                                           Inj. Vol.:        35 µl
=====
```

```
Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   11/5/2019 08:44:45
=====
```

Perchlorate analysis

===== Sample Information =====

```
Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  0.000
=====
```

===== LCMS Results =====

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.330	PBA	193530.4	5.0000	CLO4-89-ISTD

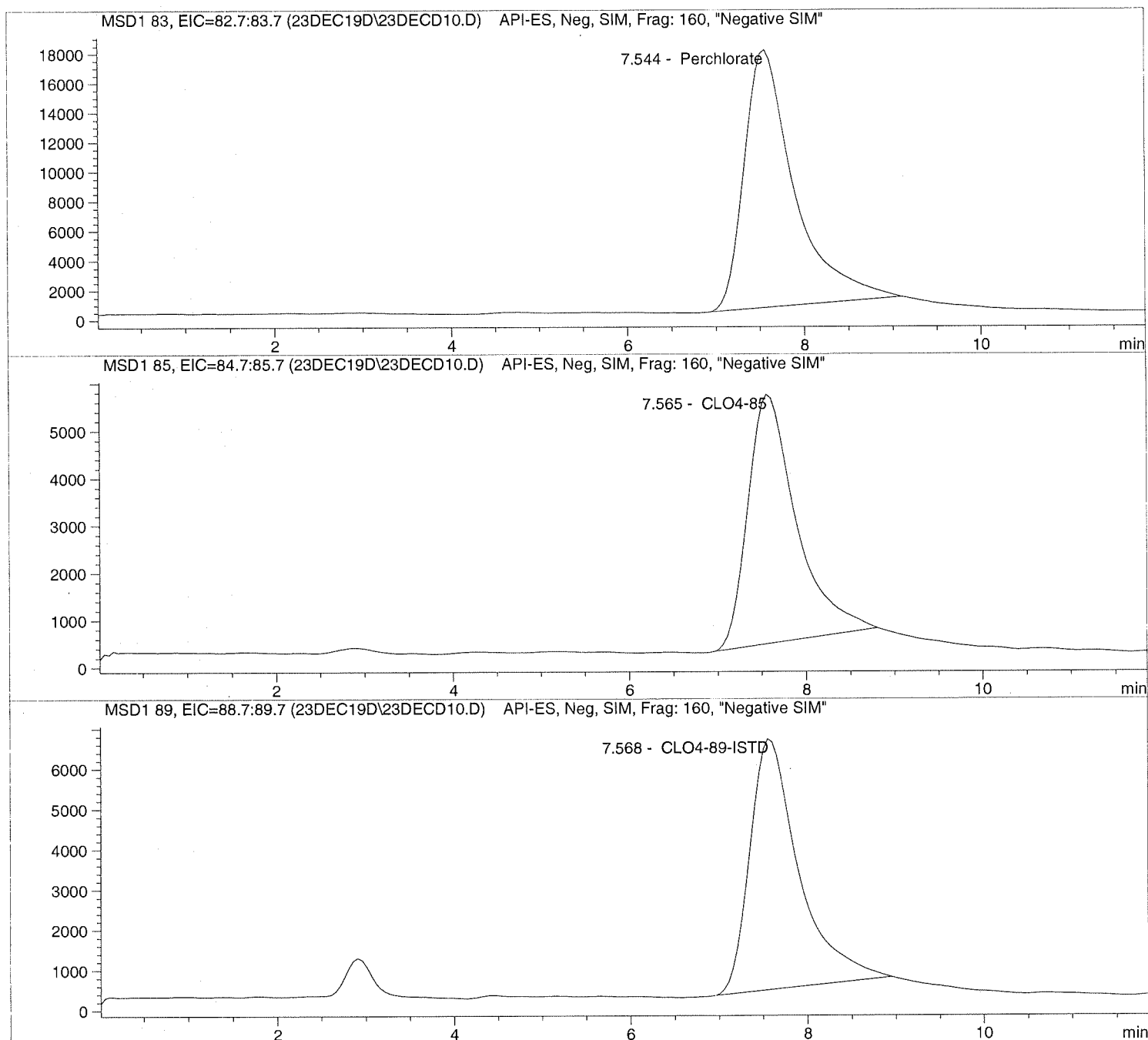
=====
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\23DEC19D\23DECD10.D Sample Name: 1935345006 100

```
=====
Injection Date: 12/23/2019 10:16:44      Seq Line: 10
Sample Name: 1935345006 100              Location: Vial 80
Acq Operator: TNB                        Inj. No.: 1
                                           Inj. Vol.: 35 µl
=====
```

```
Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45
```

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23DEC19D\23DEC10.D Sample Name: 1935345006 100

```

=====
Injection Date: 12/23/2019 10:16:44      Seq Line:      10
Sample Name:   1935345006 100             Location:      Vial 80
Acq Operator:  TNB                       Inj. No.:     1
                                           Inj. Vol.:    35 µl
=====

```

```

Acq. Method:   CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:  11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       100.000000
Sample Amount:  0.000
=====

```

```

=====
                          LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.544	PBA	685819.4	1037.7700	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.565	PBA	200418.5	987.2414	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.568	PBA	239667.0	500.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\23DEC19D\23DECD11.D

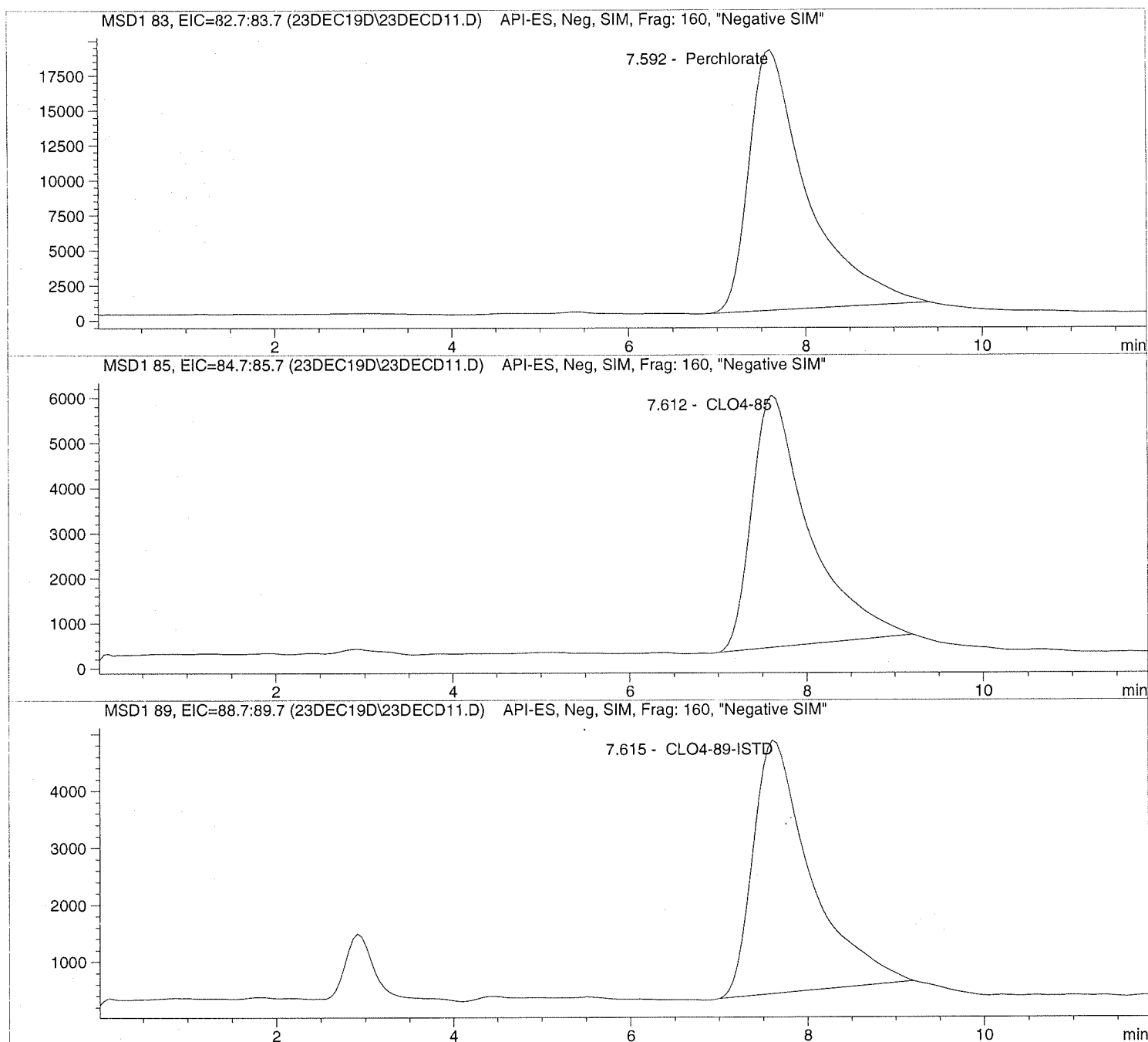
Sample Name: 1935345007 1K

Injection Date: 12/23/2019 10:30:38
Sample Name: 1935345007 1K
Acq Operator: TNB

Seq Line: 11
Location: Vial 81
Inj. No.: 1
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23DEC19D\23DEC11.D Sample Name: 1935345007 1K

```

=====
Injection Date: 12/23/2019 10:30:38      Seq Line:      11
Sample Name:    1935345007 1K             Location:      Vial 81
Acq Operator:   TNB                       Inj. No.:     1
                                           Inj. Vol.:    35 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1000.000000
Sample Amount:  0.000
=====

```

```

=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.592	PBA	848401.4	14986.6893	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.612	PBA	250753.5	14479.3444	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.615	PBA	201594.0	5000.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```


Data file: C:\HPCHEM\1\DATA\23DEC19D\23DECD12.D

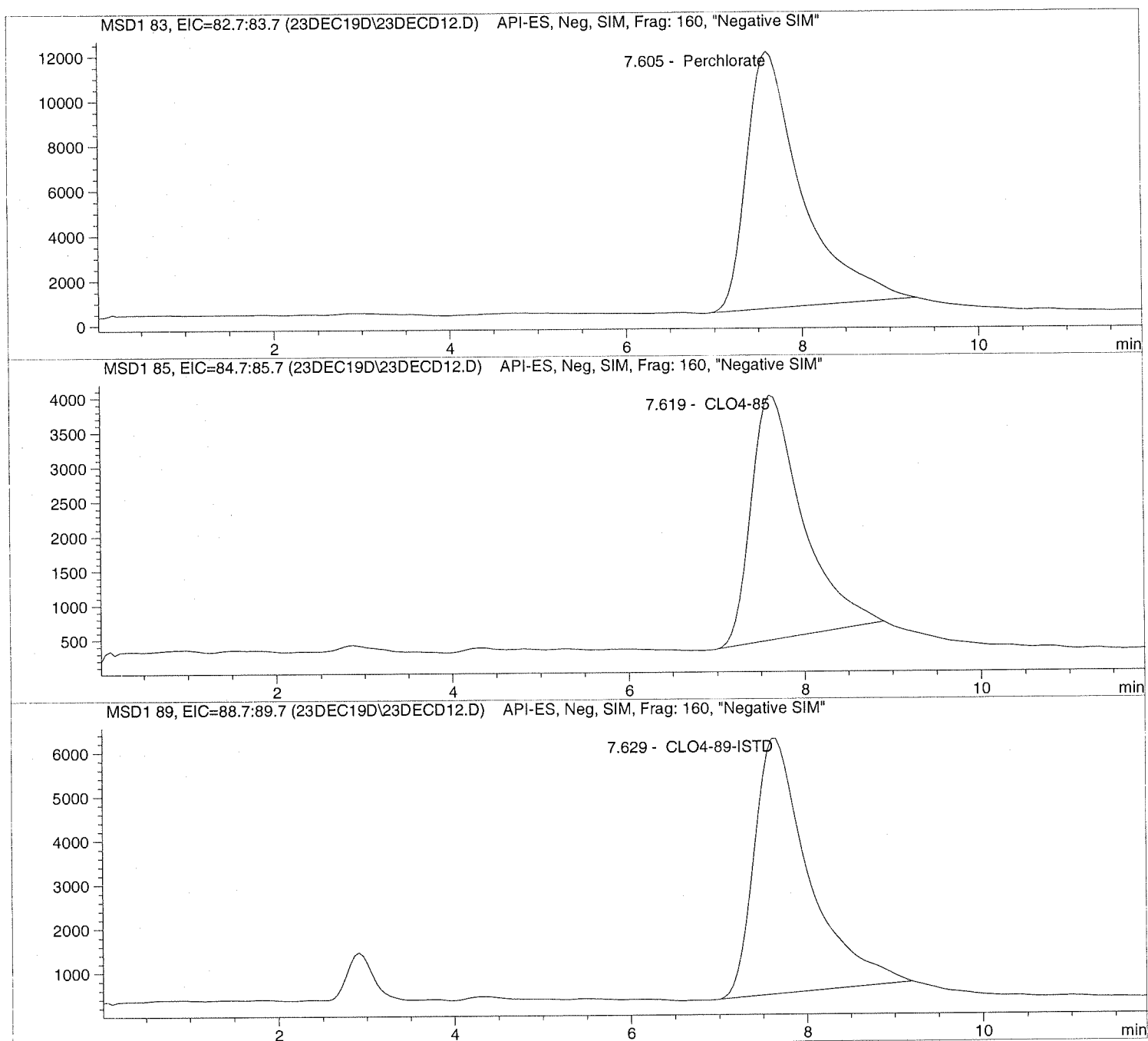
Sample Name: 1935345008 10K

Injection Date: 12/23/2019 10:44:29
Sample Name: 1935345008 10K
Acq Operator: TNB

Seq Line: 12
Location: Vial 82
Inj. No.: 1
Inj. Vol.: 35 μ l

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23DEC19D\23DECD12.D Sample Name: 1935345008 10K

```

=====
Injection Date: 12/23/2019 10:44:29      Seq Line: 12
Sample Name: 1935345008 10K             Location: Vial 82
Acq Operator: TNB                       Inj. No.: 1
                                           Inj. Vol.: 35 µl
=====

```

```

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By: Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier: 1.000000
Dilution: 10000.000000
Sample Amount: 0.000
=====

```

```

=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.605	PBA	501020.7	73174.5193	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.619	PBA	144991.8	68589.2543	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.629	PBA	250964.5	50000.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

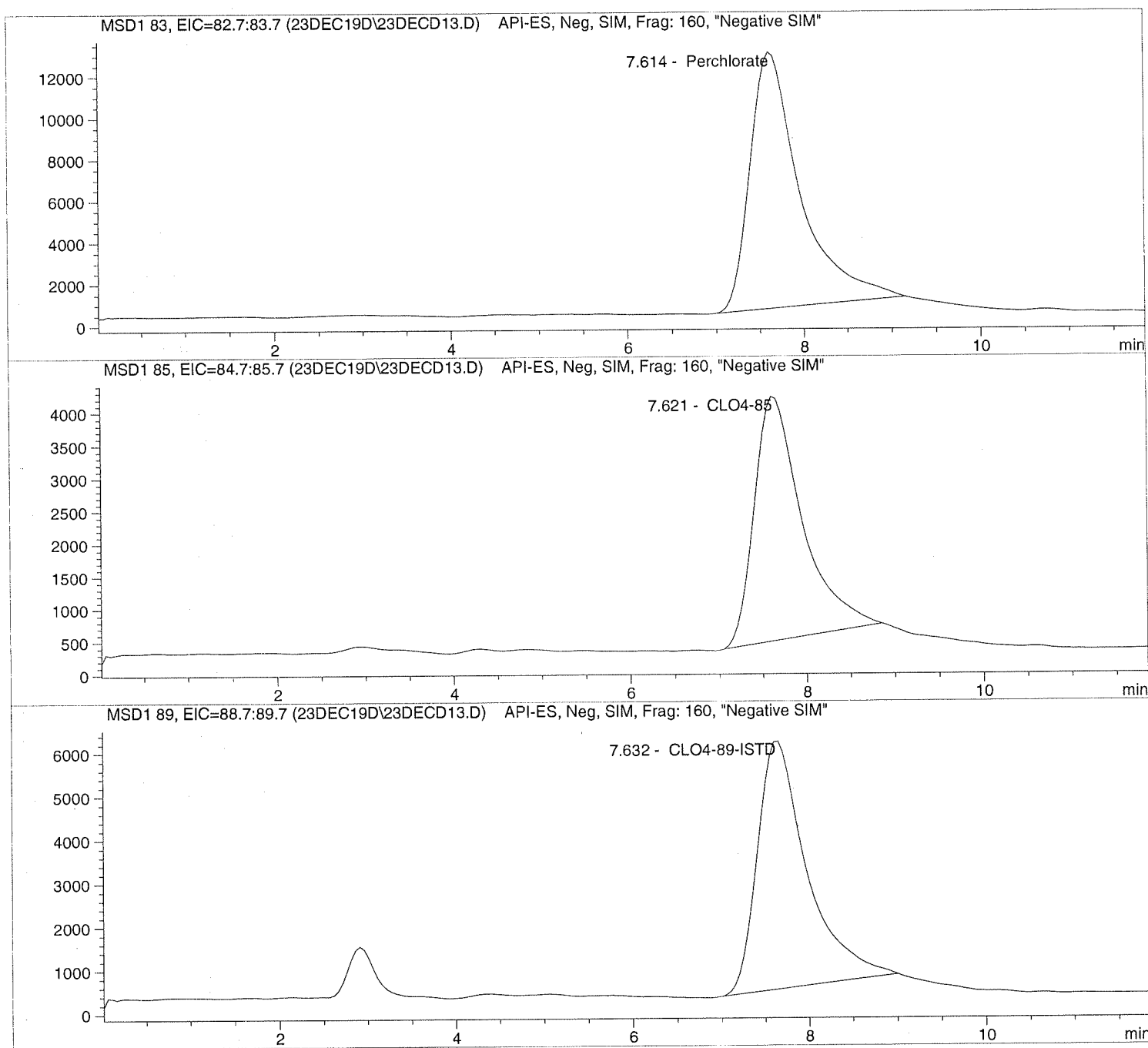
```

Data file: C:\HPCHEM\1\DATA\23DEC19D\23DECD13.D Sample Name: 1935345009 10K

```
=====
Injection Date: 12/23/2019 10:58:21 Seq Line: 13
Sample Name: 1935345009 10K Location: Vial 83
Acq Operator: TNB Inj. No.: 1
Inj. Vol.: 35 µl
=====
```

```
Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45
```

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23DEC19D\23DEC13.D Sample Name: 1935345009 10K

```

=====
Injection Date: 12/23/2019 10:58:21      Seq Line:          13
Sample Name:   1935345009 10K            Location:         Vial 83
Acq Operator:  TNB                       Inj. No.:        1
                                           Inj. Vol.:       35 µl
=====

```

```

Acq. Method:   CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:  11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       10000.000000
Sample Amount:  0.000
=====

```

```

=====
                          LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.614	PBA	488879.8	79598.8740	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.621	PBA	142325.9	75155.2365	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.632	PBA	224661.1	50000.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

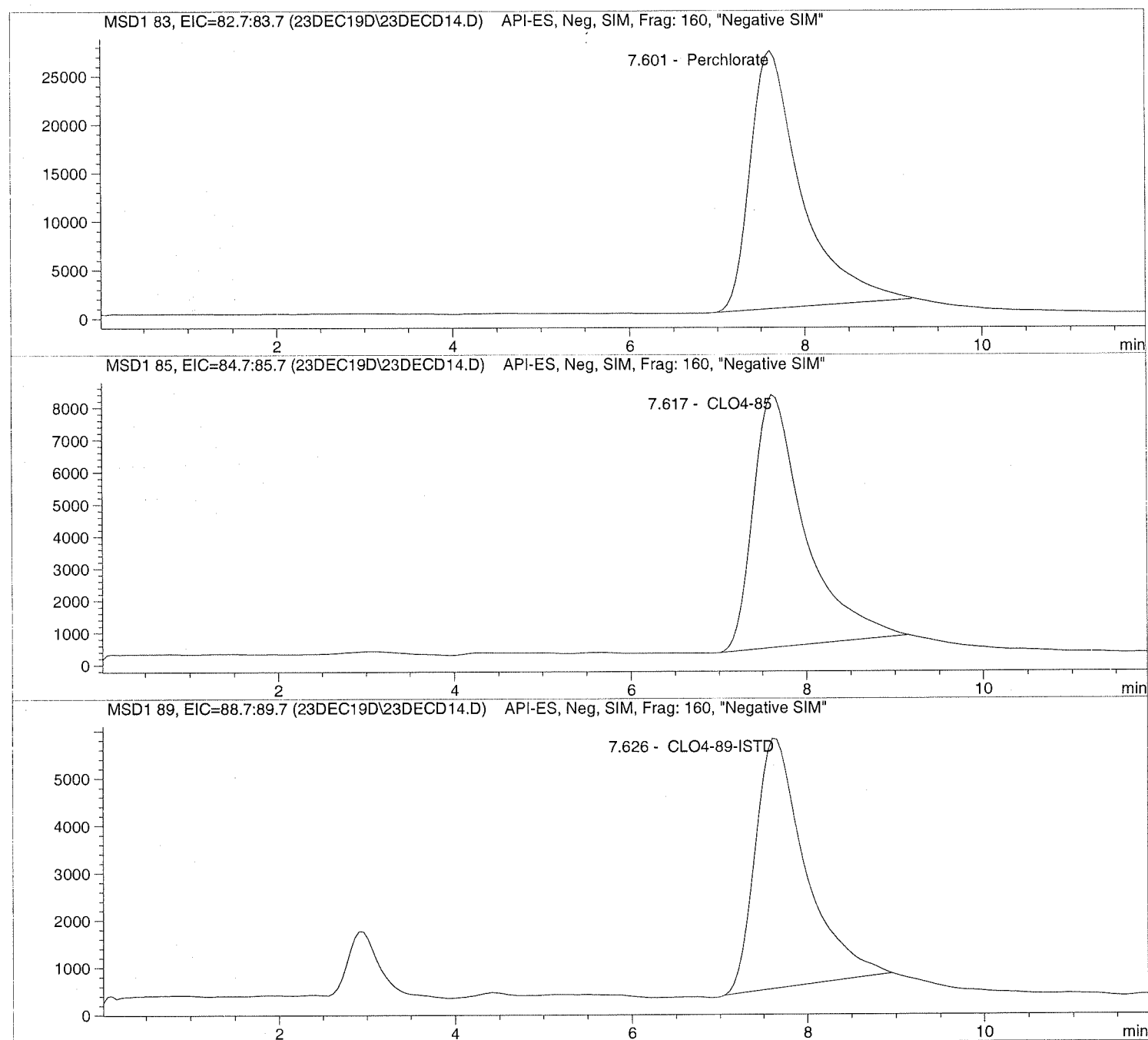
```

Data file: C:\HPCHEM\1\DATA\23DEC19D\23DECD14.D Sample Name: 1935345010 100

```
=====
Injection Date: 12/23/2019 11:12:11      Seq Line:      14
Sample Name:    1935345010 100           Location:      Vial 84
Acq Operator:   TNB                      Inj. No.:     1
                                           Inj. Vol.:    35 µl
=====
```

```
Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   11/5/2019 08:44:45
```

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23DEC19D\23DECD14.D Sample Name: 1935345010 100

```

=====
Injection Date: 12/23/2019 11:12:11      Seq Line:          14
Sample Name:    1935345010 100           Location:          Vial 84
Acq Operator:   TNB                      Inj. No.:         1
                                           Inj. Vol.:        35 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       100.000000
Sample Amount:  0.000
=====

```

```

=====
                          LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.601	PBA	1076000.9	1802.1441	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.617	PBA	322492.7	1767.8734	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.626	PBA	209986.7	500.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\23DEC19D\23DECD15.D

Sample Name: 689414 CCV@25

Injection Date: 12/23/2019 11:26:02

Seq Line: 15

Sample Name: 689414 CCV@25

Location: Vial 71

Acq Operator: TNB *Sas*

Inj. No.: 1

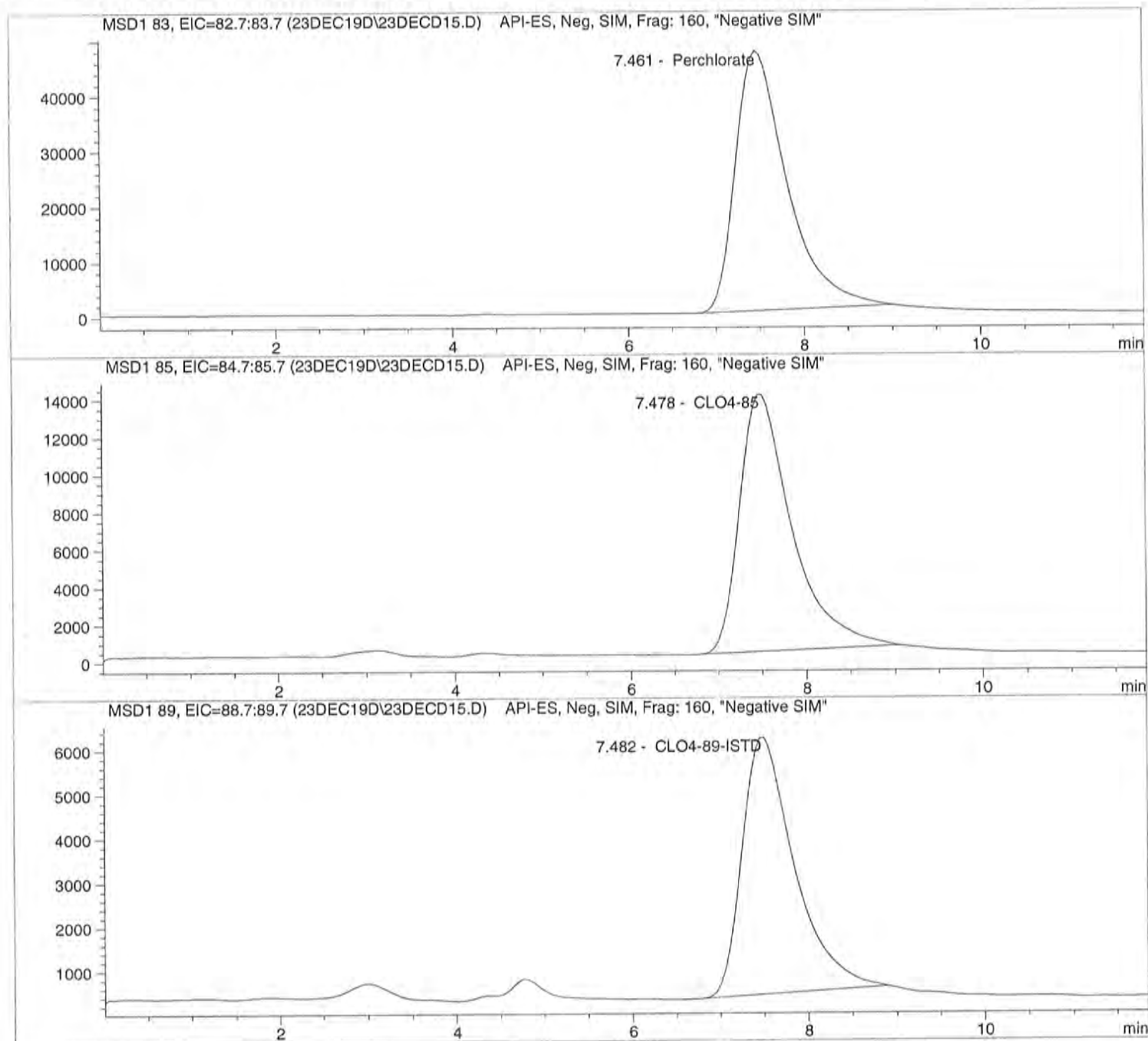
Inj. Vol.: 35 μ l*T.B 12.30.19*

Acq. Method: CLO4-AQN.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M

Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23DEC19D\23DEC15.D Sample Name: 689414 CCV@25

```

=====
Injection Date: 12/23/2019 11:26:02      Seq Line:          15
Sample Name:   689414 CCV@25             Location:          Vial 71
Acq Operator:  TNB 528                   Inj. No.:         1
                                           Inj. Vol.:        35 µl
                                           TB 12-30-19
=====

```

```

Acq. Method:   CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:  11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  25.000
=====

```

```

=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.461	PBA	1910947.6	26.9979	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.478	PBA	566704.3	26.3409	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.482	PBA	239872.9	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```


Data file: C:\HPCHEM\1\DATA\23DEC19D\23DECD16.D

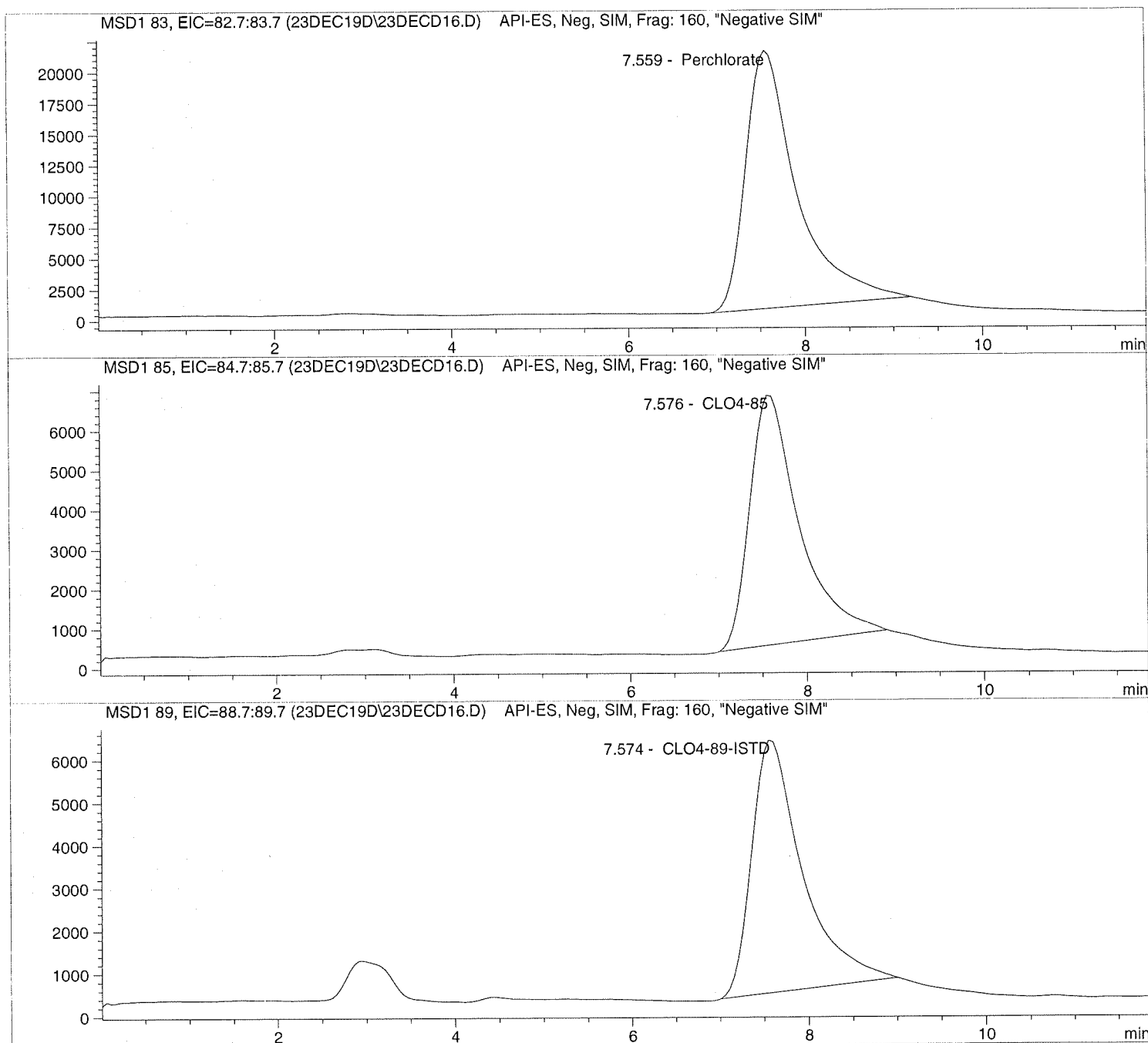
Sample Name: 1935347001 1K

Injection Date: 12/23/2019 11:39:57
Sample Name: 1935347001 1K
Acq Operator: TNB

Seq Line: 16
Location: Vial 85
Inj. No.: 1
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23DEC19D\23DECD16.D Sample Name: 1935347001 1K

```

=====
Injection Date: 12/23/2019 11:39:57      Seq Line:          16
Sample Name:    1935347001 1K            Location:          Vial 85
Acq Operator:   TNB                      Inj. No.:         1
                                           Inj. Vol.:        35 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1000.000000
Sample Amount:  0.000
=====

```

```

=====
                          LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.559	PBA	833844.3	12751.9297	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.576	PBA	243643.4	12161.9406	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.574	PBA	234965.2	5000.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

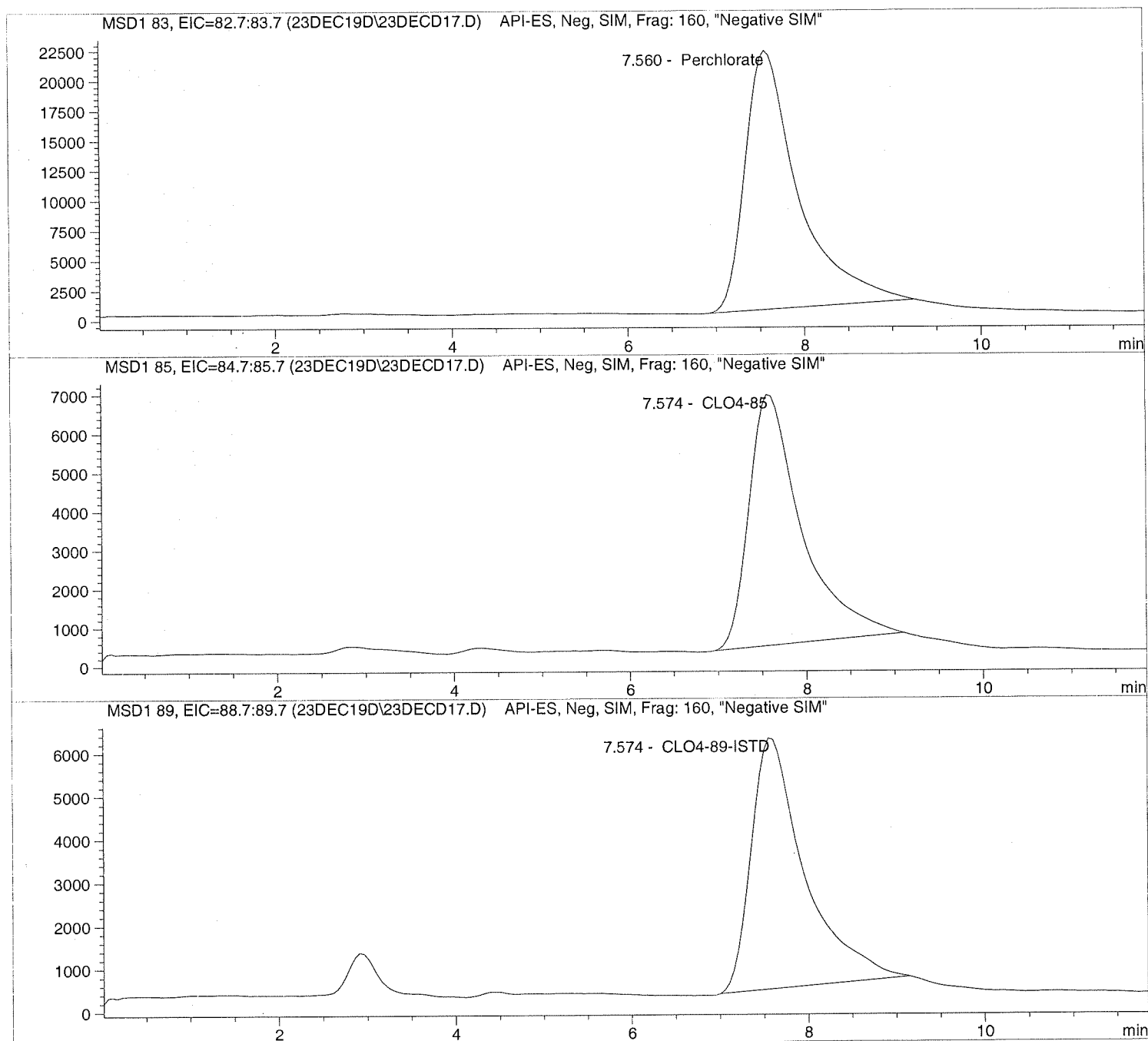
```

Data file: C:\HPCHEM\1\DATA\23DEC19D\23DECD17.D Sample Name: 1935347002 1K

```
=====
Injection Date: 12/23/2019 11:53:49      Seq Line:          17
Sample Name:    1935347002 1K            Location:          Vial 86
Acq Operator:   TNB                      Inj. No.:         1
                                           Inj. Vol.:        35 µl
=====
```

```
Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   11/5/2019 08:44:45
=====
```

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23DEC19D\23DECD17.D Sample Name: 1935347002 1K

```

=====
Injection Date: 12/23/2019 11:53:49      Seq Line:          17
Sample Name:    1935347002 1K           Location:         Vial 86
Acq Operator:   TNB                     Inj. No.:        1
                                           Inj. Vol.:       35 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1000.000000
Sample Amount:  0.000
=====

```

```

=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.560	PBA	901055.0	13240.2824	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.574	PBA	268208.5	12860.7607	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.574	PBA	244063.0	5000.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

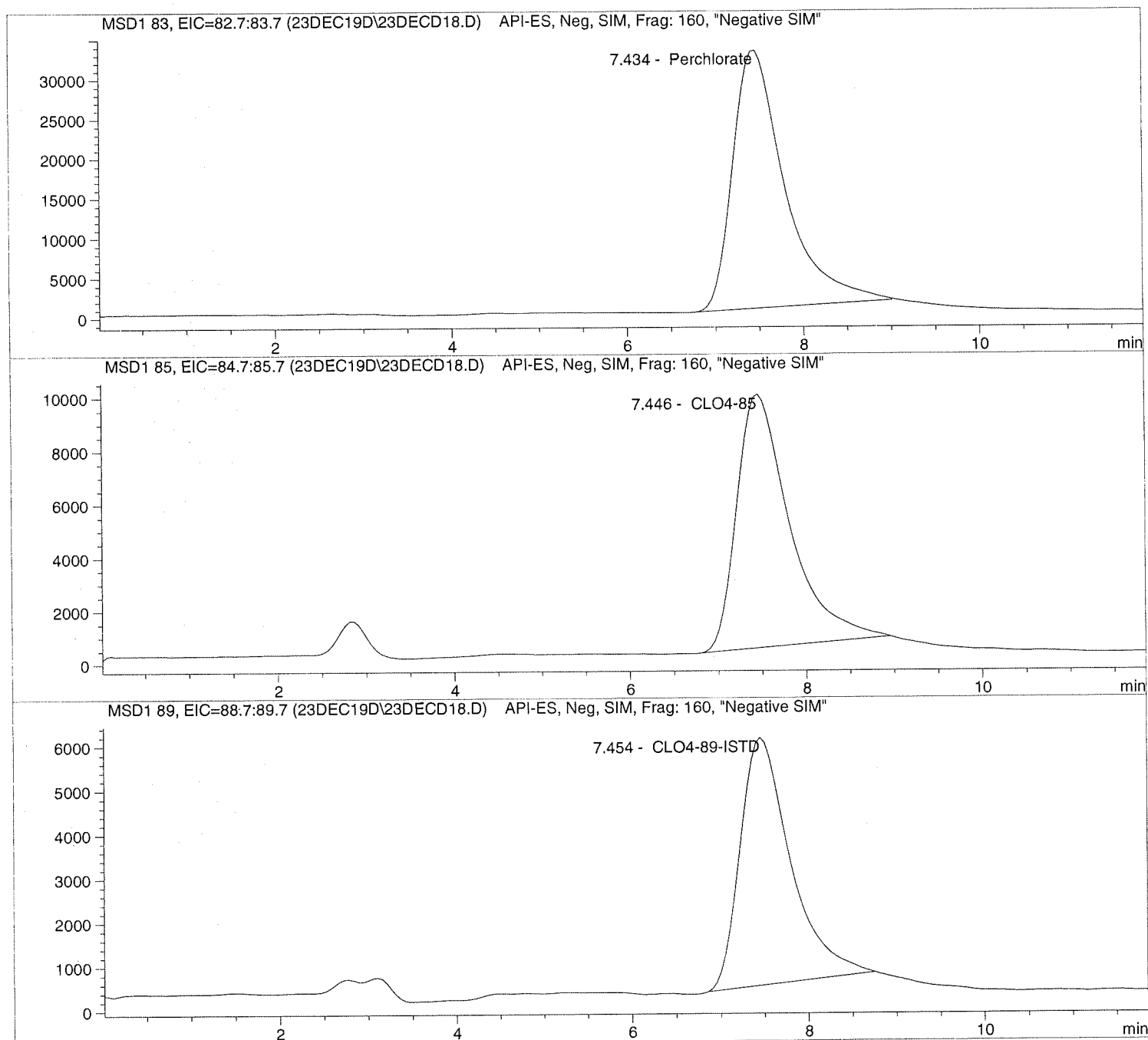
```

Data file: C:\HPCHEM\1\DATA\23DEC19D\23DECD18.D Sample Name: 1935347003 10X

```
=====
Injection Date: 12/23/2019 12:07:42      Seq Line:          18
Sample Name:    1935347003 10X           Location:          Vial 87
Acq Operator:   TNB                      Inj. No.:         1
                                           Inj. Vol.:        35 µl
=====
```

```
Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   11/5/2019 08:44:45
```

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23DEC19D\23DECD18.D Sample Name: 1935347003 10X

```

=====
Injection Date: 12/23/2019 12:07:42      Seq Line:          18
Sample Name:   1935347003 10X            Location:         Vial 87
Acq Operator:  TNB                       Inj. No.:        1
                                           Inj. Vol.:       35 µl
=====

```

```

Acq. Method:   CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:  11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:    1.000000
Dilution:      10.000000
Sample Amount: 0.000
=====

```

```

=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.434	PBA	1335757.6	207.3848	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.446	PBA	397795.7	202.5295	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.454	PBA	223994.3	50.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\23DEC19D\23DECD21.D

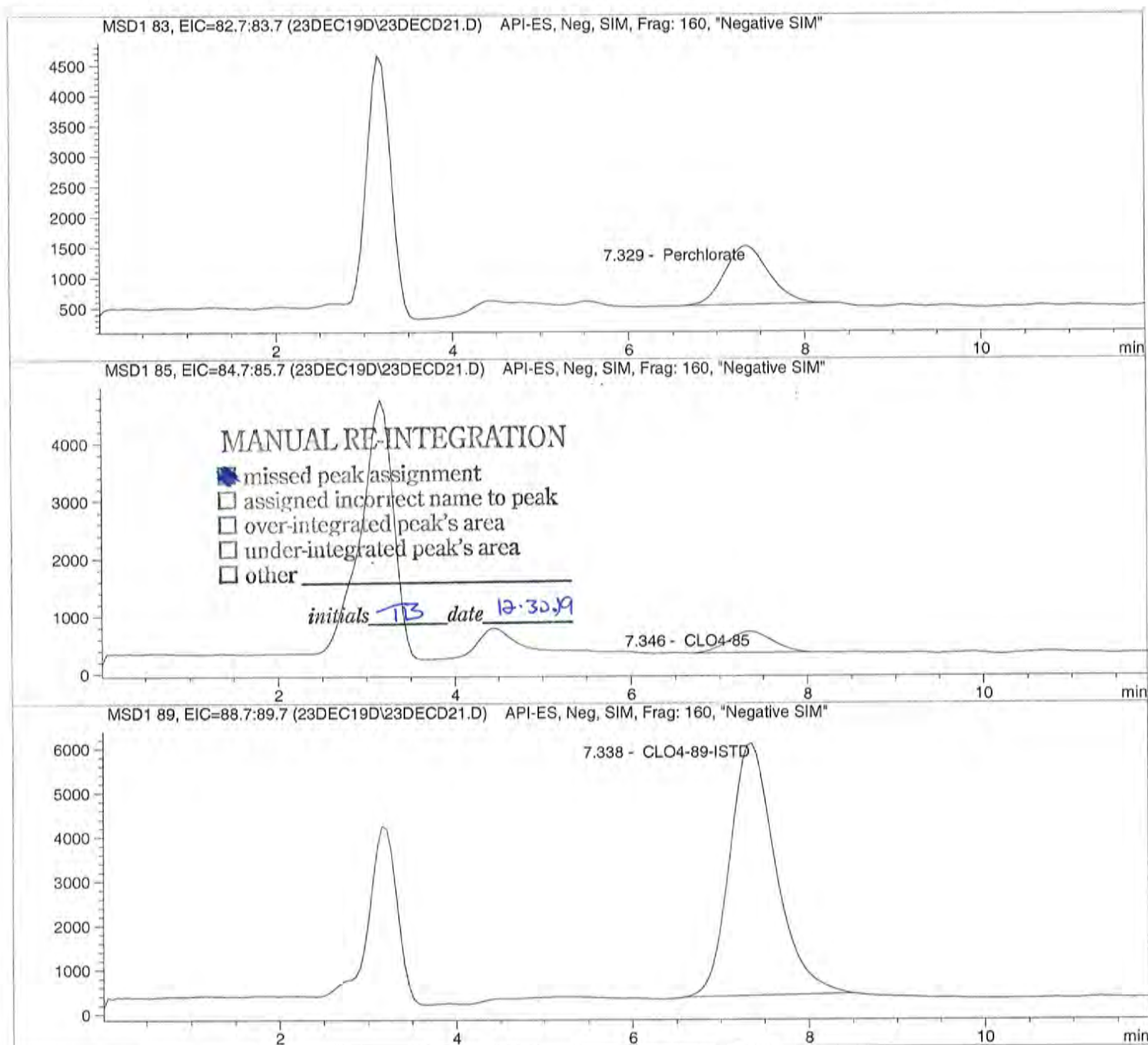
Sample Name: 1935347006

Injection Date: 12/23/2019 12:49:23
 Sample Name: 1935347006
 Acq Operator: TNB

Seq Line: 21
 Location: Vial 90
 Inj. No.: 1
 Inj. Vol.: 35 μ l

Acq. Method: CLO4-AQN.M
 Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
 Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23DEC19D\23DECD21.D

Sample Name: 1935347006

```

=====
Injection Date: 12/23/2019 12:49:23      Seq Line: 21
Sample Name: 1935347006                  Location: Vial 90
Acq Operator: TNB                        Inj. No.: 1
                                           Inj. Vol.: 35 µl
=====

```

```

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By: Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 0.000
=====

```

```

=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.329	PBA	33750.8	0.5414	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.346	MM	13025.6	0.6212	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.338	BBA	206441.3	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```


Data file: C:\HPCHEM\1\DATA\23DEC19D\23DECD22.D

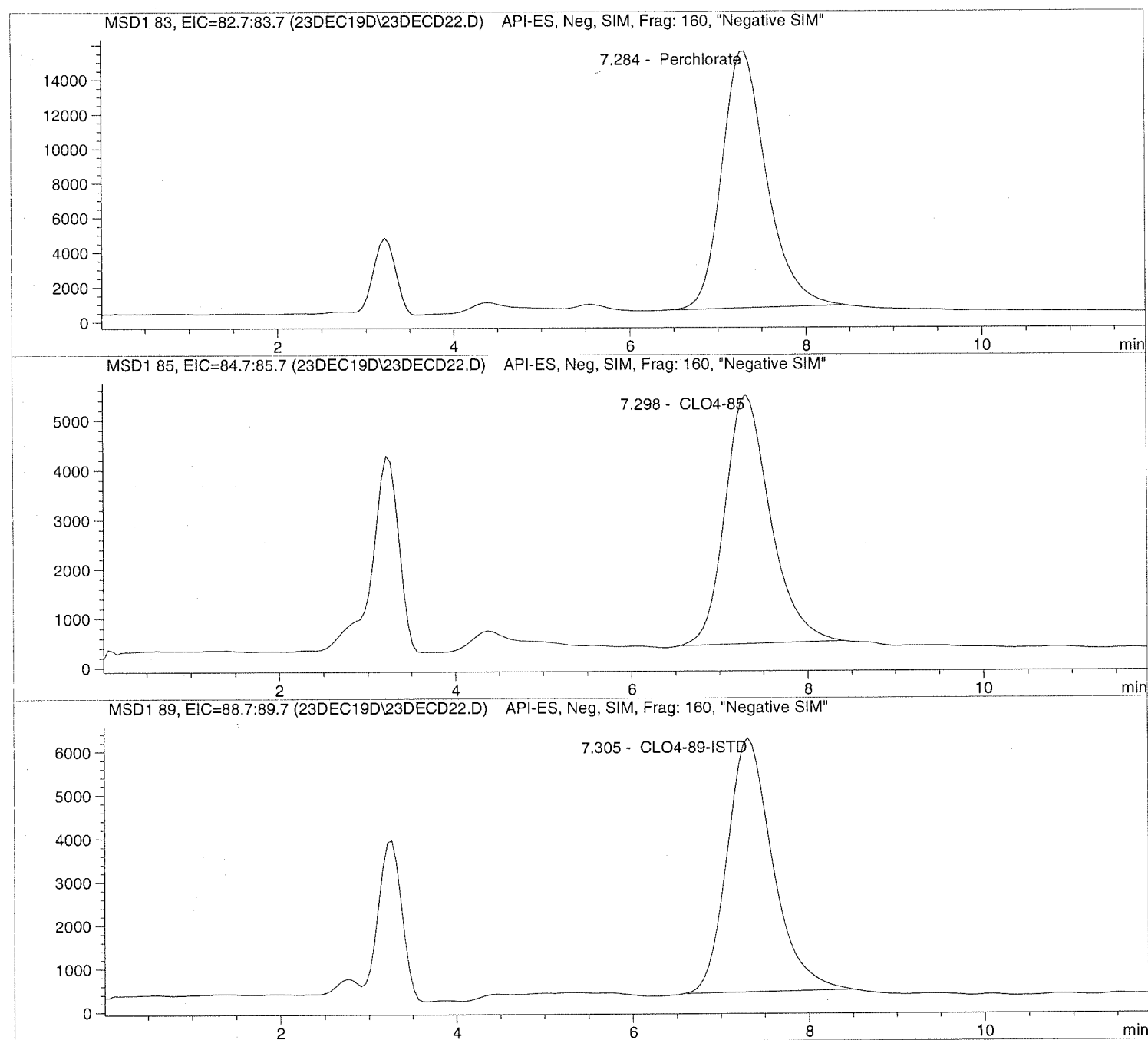
Sample Name: 1935347007

=====
Injection Date: 12/23/2019 13:03:18
Sample Name: 1935347007
Acq Operator: TNB

Seq Line: 22
Location: Vial 91
Inj. No.: 1
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23DEC19D\23DECD22.D Sample Name: 1935347007

```

=====
Injection Date: 12/23/2019 13:03:18      Seq Line:      22
Sample Name:    1935347007                Location:      Vial 91
Acq Operator:   TNB                       Inj. No.:     1
                                           Inj. Vol.:    35 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  0.000
=====

```

```

=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.284	BBA	521432.8	9.0837	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.298	BBA	179359.4	10.1168	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.305	BBA	209168.8	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\23DEC19D\23DECD23.D

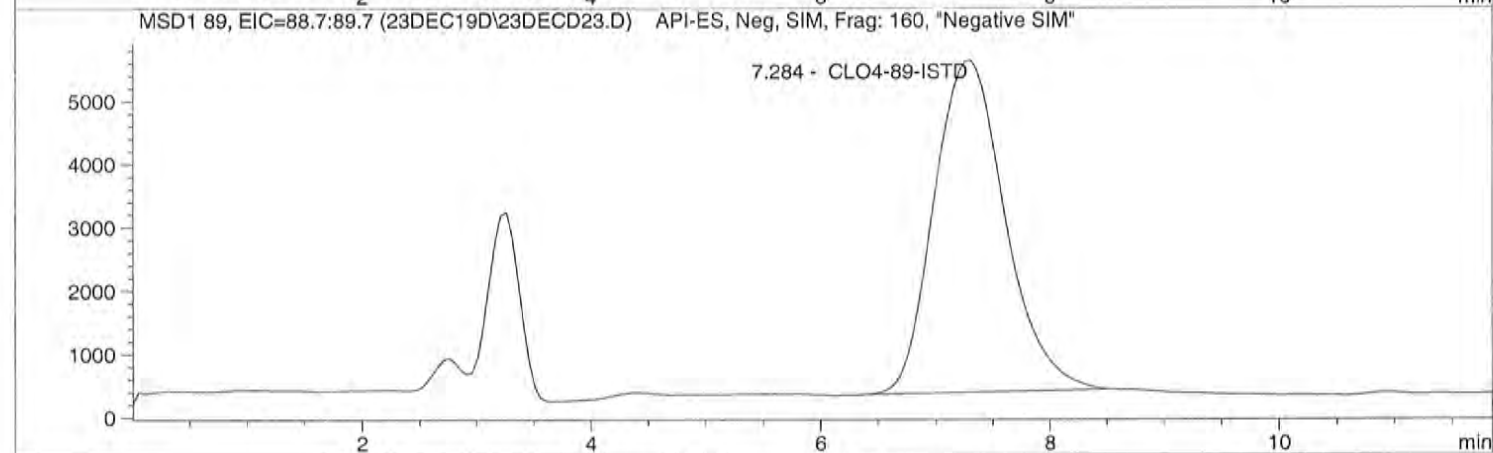
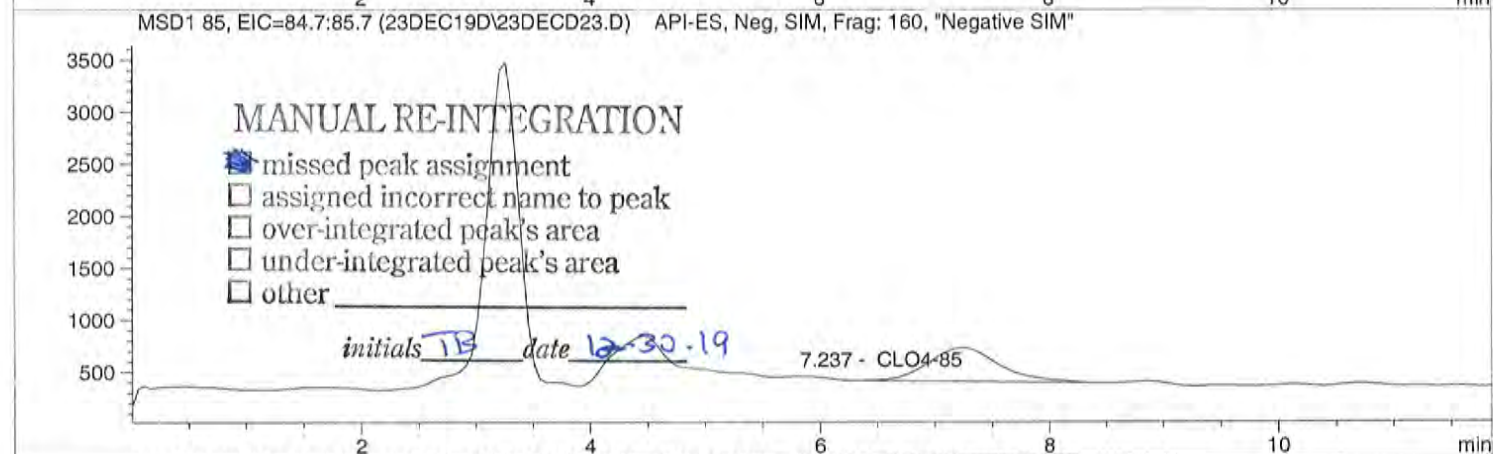
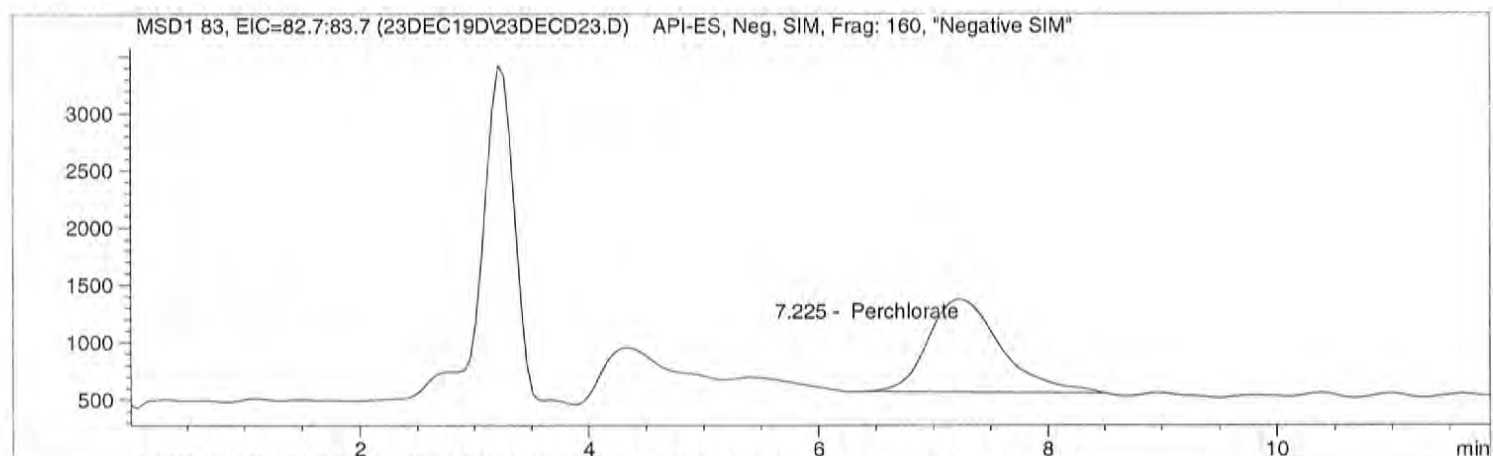
Sample Name: 1935366001

Injection Date: 12/23/2019 13:17:14
Sample Name: 1935366001
Acq Operator: TNB

Seq Line: 23
Location: Vial 92
Inj. No.: 1
Inj. Vol.: 35 μ l

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23DEC19D\23DECD23.D Sample Name: 1935366001

```

=====
Injection Date: 12/23/2019 13:17:14      Seq Line:      23
Sample Name:   1935366001                Location:      Vial 92
Acq Operator:  TNB                       Inj. No.:     1
                                           Inj. Vol.:    35 µl
=====

```

```

Acq. Method:   CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:  11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:    1.000000
Dilution:      1.000000
Sample Amount: 0.000
=====

```

```

=====
                          LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.225	PBA	35581.3	0.5167	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.237	MM	14057.6	0.6080	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.284	PBA	226617.1	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

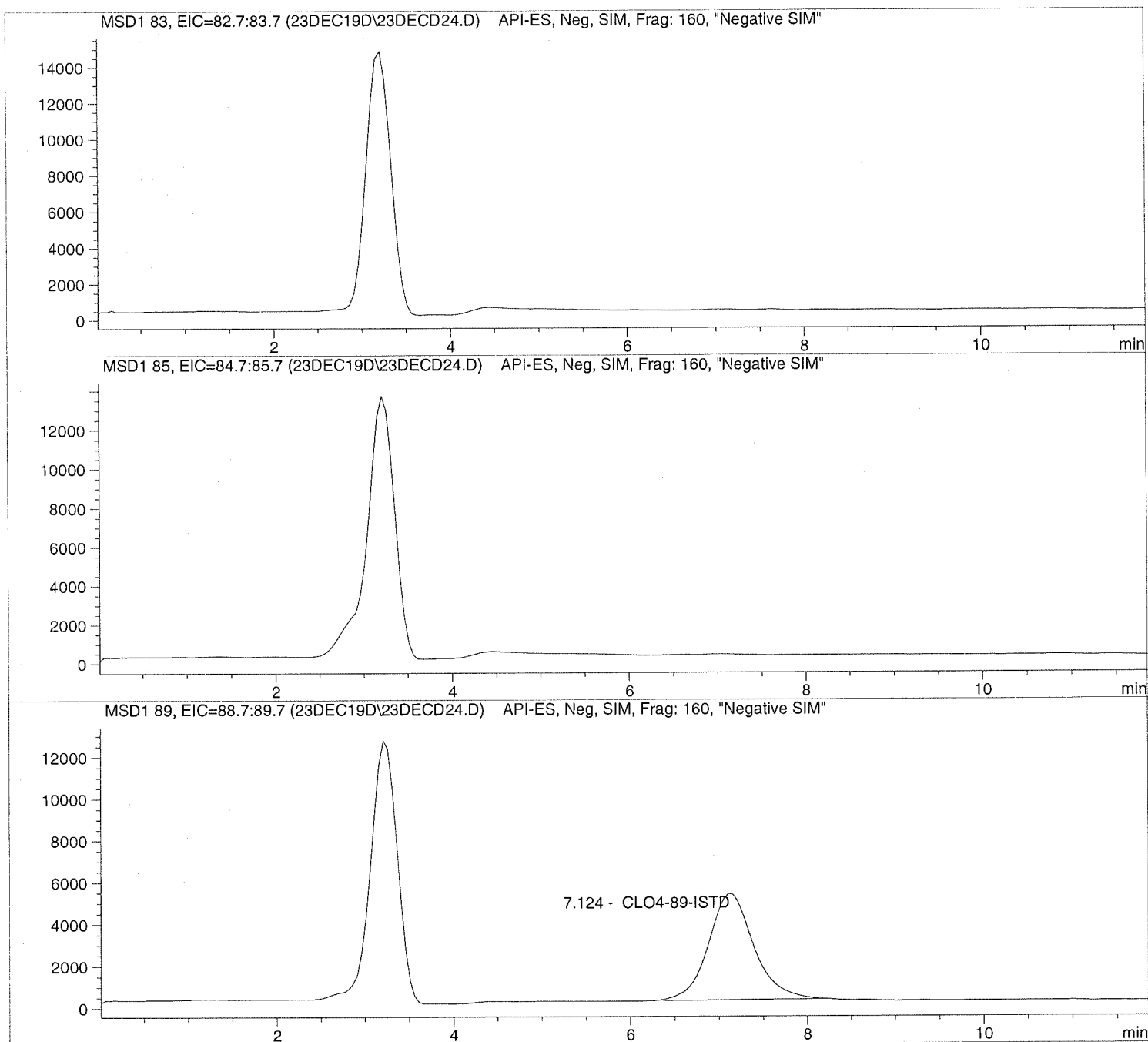
```

Data file: C:\HPCHEM\1\DATA\23DEC19D\23DECD24.D Sample Name: 1935345003 5X

```
=====
Injection Date: 12/23/2019 13:31:15      Seq Line:          24
Sample Name:    1935345003 5X             Location:          Vial 93
Acq Operator:   TNB                       Inj. No.:         1
                                           Inj. Vol.:        35 µl
=====
```

```
Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   11/5/2019 08:44:45
```

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23DEC19D\23DECD24.D Sample Name: 1935345003 5X

```

=====
Injection Date: 12/23/2019 13:31:15      Seq Line:      24
Sample Name:    1935345003 5X             Location:      Vial 93
Acq Operator:   TNB                       Inj. No.:     1
                                           Inj. Vol.:    35 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       5.000000
Sample Amount:  0.000
=====

```

```

=====
                          LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.124	BBA	180510.4	25.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

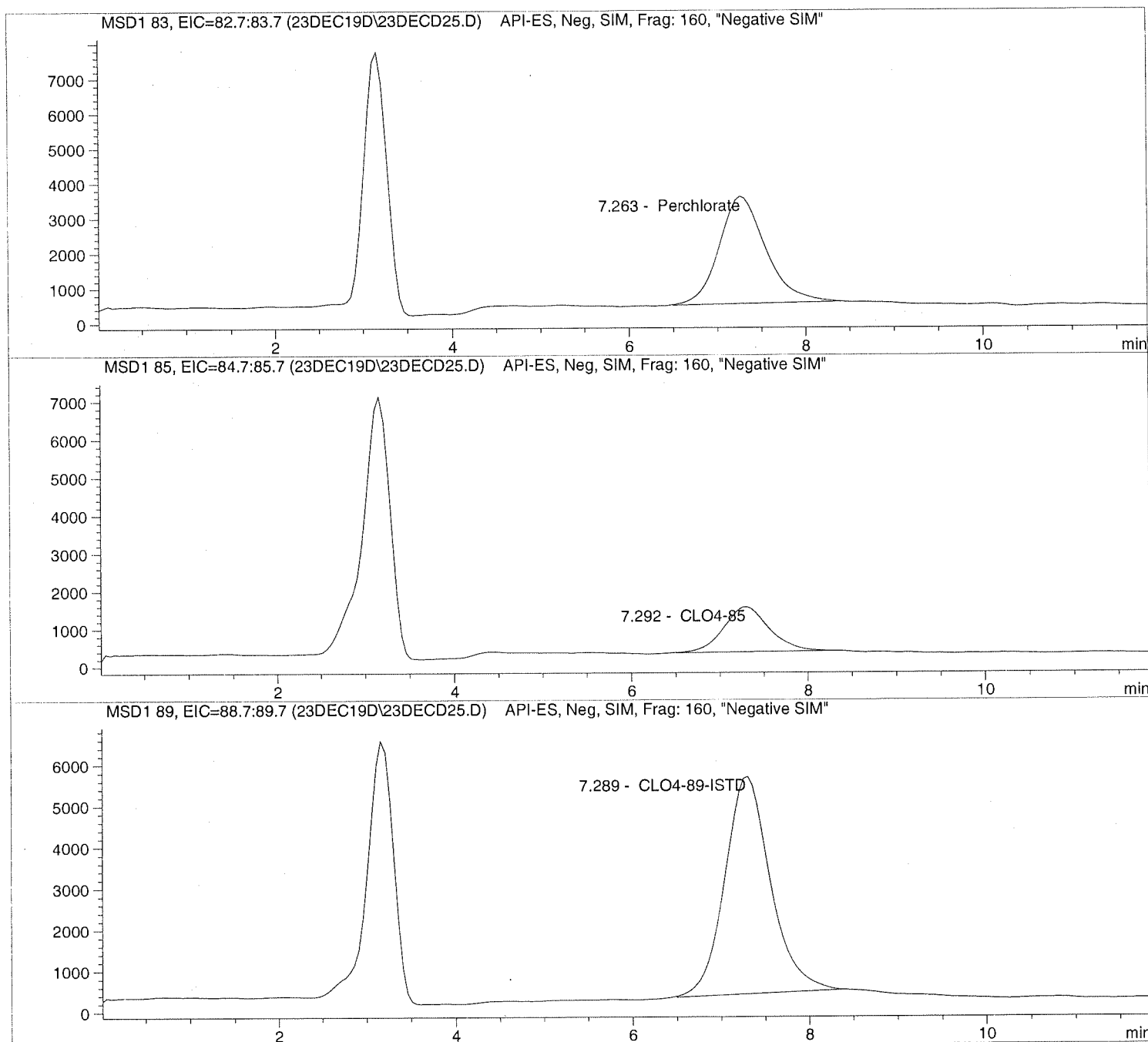
```

Data file: C:\HPCHEM\1\DATA\23DEC19D\23DECD25.D Sample Name: 1935345004 5X

```
=====
Injection Date: 12/23/2019 13:45:07      Seq Line:      25
Sample Name:    1935345004 5X             Location:      Vial 94
Acq Operator:   TNB                       Inj. No.:     1
                                           Inj. Vol.:    35 µl
=====
```

```
Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   11/5/2019 08:44:45
=====
```

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23DEC19D\23DECD25.D Sample Name: 1935345004 5X

```

=====
Injection Date: 12/23/2019 13:45:07      Seq Line:          25
Sample Name:    1935345004 5X             Location:         Vial 94
Acq Operator:   TNB                       Inj. No.:        1
                                           Inj. Vol.:       35 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       5.000000
Sample Amount:  0.000
=====

```

```

=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.263	BBA	112394.8	10.7958	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.292	BBA	42859.8	13.1155	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.289	BBA	190269.1	25.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```


Data file: C:\HPCHEM\1\DATA\23DEC19D\23DECD26.D

Sample Name: 689415 CCV@25

Injection Date: 12/23/2019 13:59:13

Seq Line: 26

Sample Name: 689415 CCV@25

Location: Vial 71

Acq Operator: TNB 529

Inj. No.: 1

TB 12.30.19

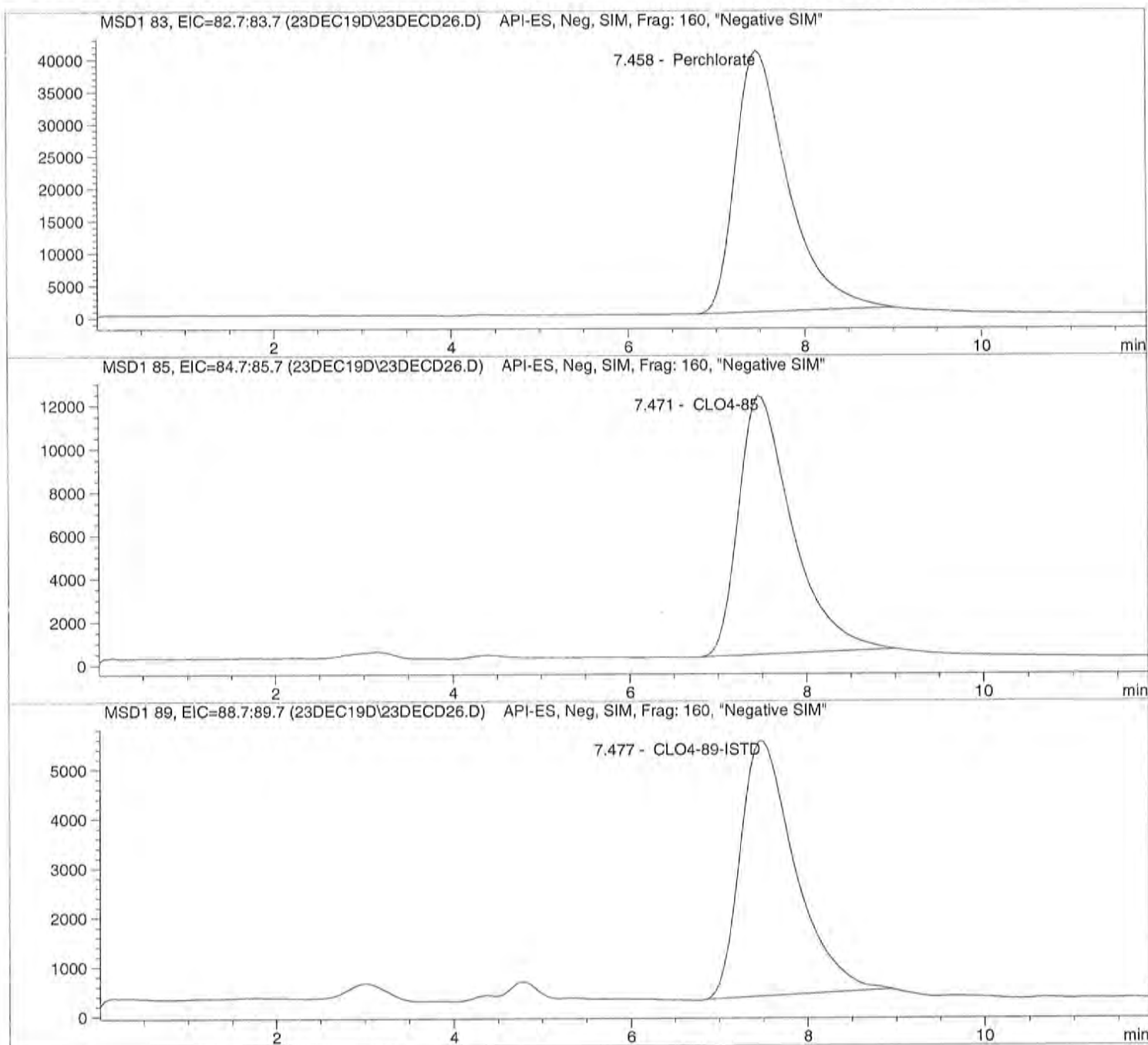
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M

Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23DEC19D\23DEC26.D Sample Name: 689415 CCV@25

=====
 Injection Date: 12/23/2019 13:59:13 Seq Line: 26
 Sample Name: 689415 CCV@25 Location: Vial 71
 Acq Operator: TNB 529 Inj. No.: 1
 TB 12.32.19 Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M
 Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
 Last Changed: 11/5/2019 08:44:45

Perchlorate analysis

=====
 Sample Information
 =====

Sorted By: Signal
 Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
 Multiplier: 1.000000
 Dilution: 1.000000
 Sample Amount: 25.000

=====
 LCMS Results
 =====

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.458	PBA	1673122.6	25.5598	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.471	PBA	503084.9	25.2394	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.477	PBA	223152.5	5.0000	CLO4-89-ISTD

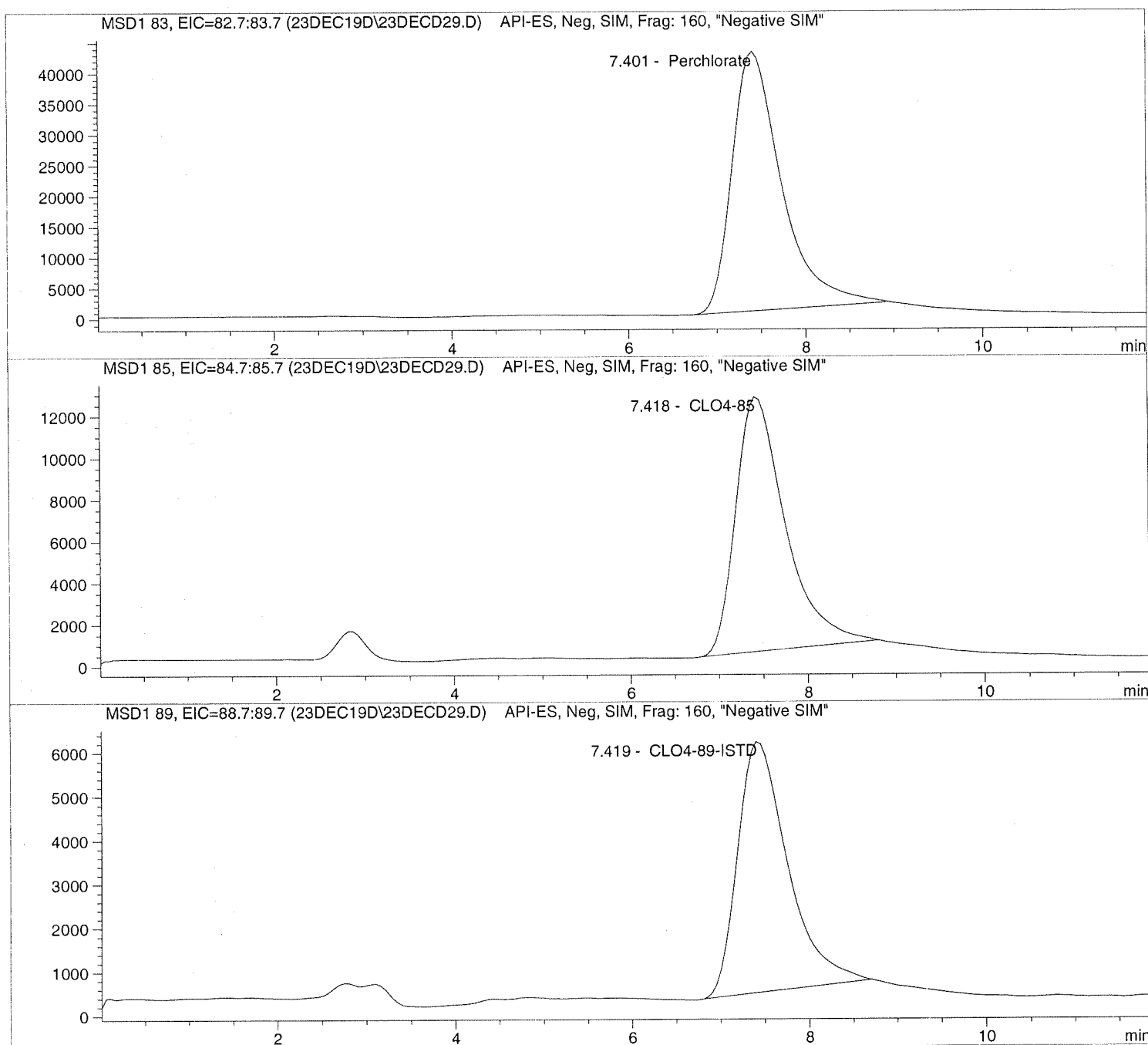
=====
 *** End of Report ***

Data file: C:\HPCHEM\1\DATA\23DEC19D\23DECD29.D Sample Name: 1935347004 MS

```
=====
Injection Date: 12/23/2019 14:45:56      Seq Line:      29
Sample Name:    1935347004 MS             Location:      Vial 97
Acq Operator:   TNB                       Inj. No.:     1
                                           Inj. Vol.:    35 µl
=====
```

```
Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   11/5/2019 08:44:45
```

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23DEC19D\23DECD29.D Sample Name: 1935347004 MS

```

=====
Injection Date: 12/23/2019 14:45:56      Seq Line:          29
Sample Name:   1935347004 MS             Location:         Vial 97
Acq Operator:  TNB                       Inj. No.:        1
                                           Inj. Vol.:      35 µl
=====

```

```

Acq. Method:   CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:  11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:    1.000000
Dilution:      10.000000
Sample Amount: 0.000
=====

```

```

=====
                          LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.401	PBA	1640825.4	249.9006	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.418	PBA	475545.6	238.5228	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.419	PBA	224360.6	50.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

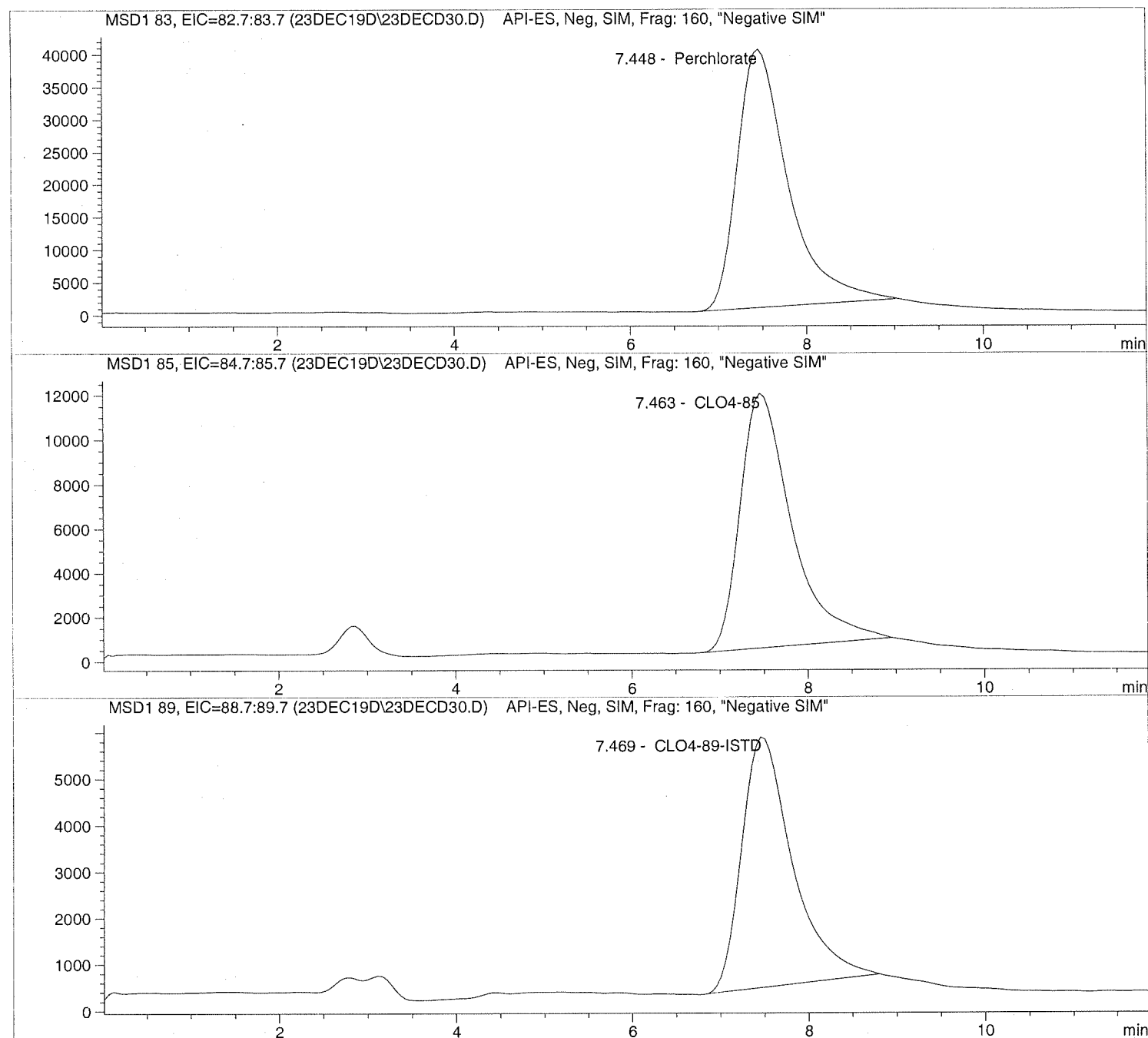
```

Data file: C:\HPCHEM\1\DATA\23DEC19D\23DECD30.D Sample Name: 1935347005 MSD

=====
Injection Date: 12/23/2019 14:59:48 Seq Line: 30
Sample Name: 1935347005 MSD Location: Vial 98
Acq Operator: TNB Inj. No.: 1
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23DEC19D\23DECD30.D Sample Name: 1935347005 MSD

```

=====
Injection Date: 12/23/2019 14:59:48      Seq Line:          30
Sample Name:   1935347005  MSD          Location:         Vial 98
Acq Operator:  TNB                      Inj. No.:        1
                                           Inj. Vol.:       35 µl
=====

```

```

Acq. Method:   CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:  11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:    1.000000
Dilution:      10.000000
Sample Amount: 0.000
=====

```

```

=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.448	PBA	1589648.0	251.1209	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.463	PBA	464977.5	241.7384	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.469	PBA	216197.6	50.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

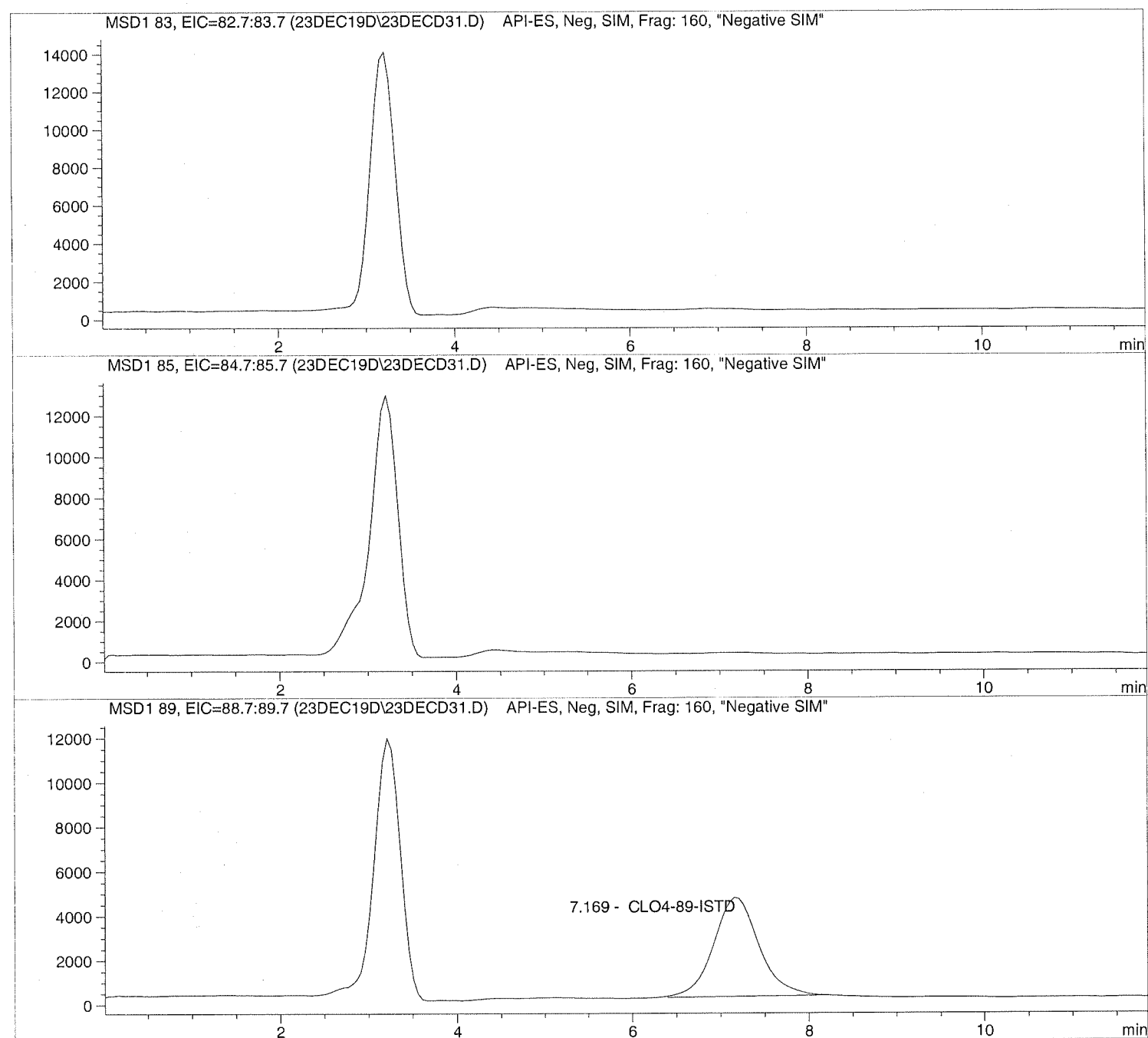
```

Data file: C:\HPCHEM\1\DATA\23DEC19D\23DECD31.D Sample Name: 1935345003 2X

```
=====
Injection Date: 12/23/2019 15:18:09      Seq Line:          31
Sample Name:    1935345003 2X            Location:         Vial 99
Acq Operator:   TNB                      Inj. No.:        1
                                           Inj. Vol.:       35 µl
=====
```

```
Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   11/5/2019 08:44:45
```

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23DEC19D\23DECD31.D Sample Name: 1935345003 2X

```

=====
Injection Date: 12/23/2019 15:18:09      Seq Line:          31
Sample Name:   1935345003 2X             Location:         Vial 99
Acq Operator:  TNB                       Inj. No.:        1
                                           Inj. Vol.:       35 µl
=====

```

```

Acq. Method:   CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:  11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:    1.000000
Dilution:      2.000000
Sample Amount: 0.000
=====

```

```

=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.169	BBA	159557.1	10.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```


Data file: C:\HPCHEM\1\DATA\23DEC19D\23DECD32.D

Sample Name: 1935345004 2X

Injection Date: 12/23/2019 15:32:02

Seq Line: 32

Sample Name: 1935345004 2X

Location: Vial 100

Acq Operator: TNB

Inj. No.: 1

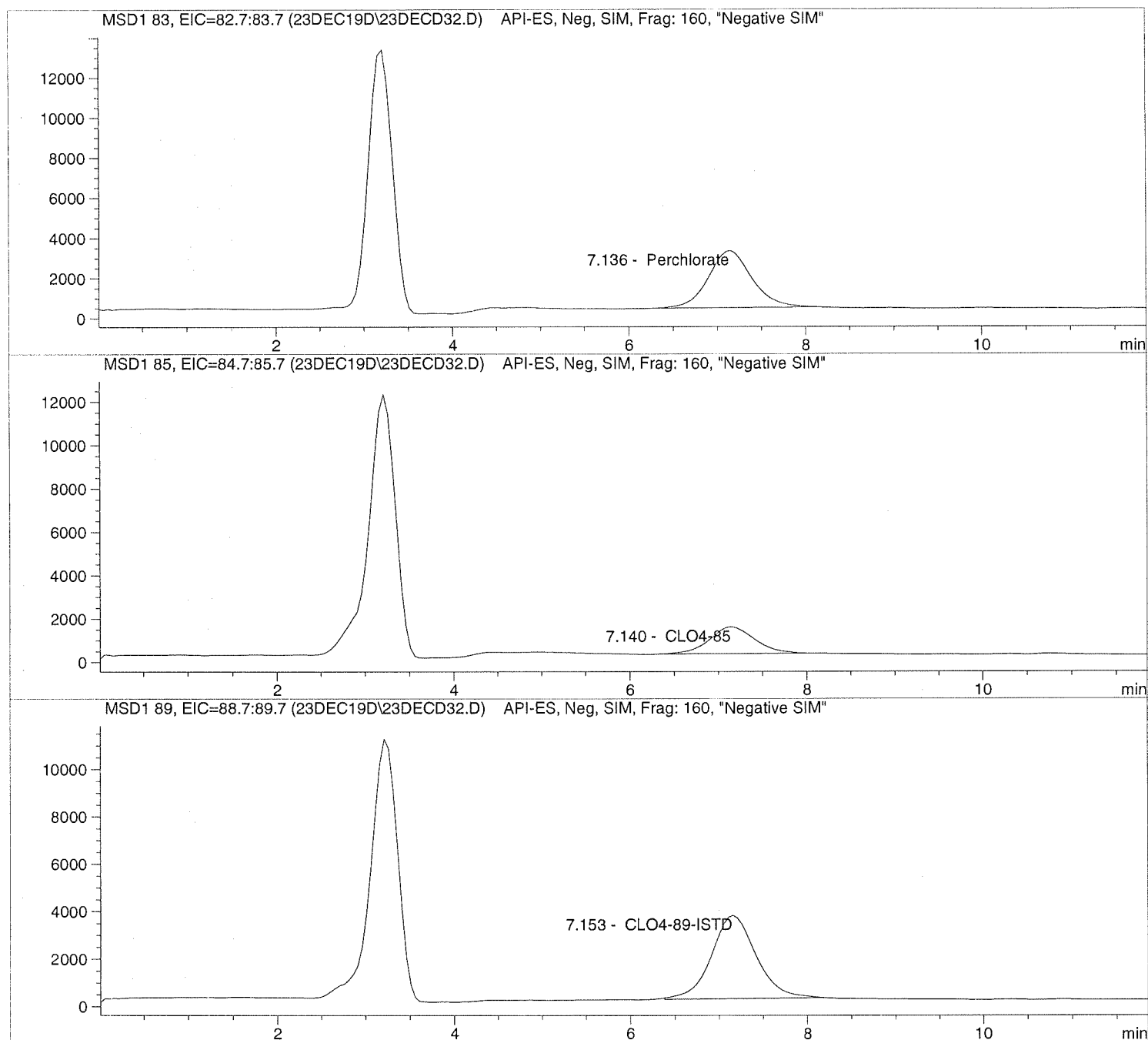
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M

Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23DEC19D\23DECD32.D Sample Name: 1935345004 2X

```

=====
Injection Date: 12/23/2019 15:32:02      Seq Line:          32
Sample Name:   1935345004 2X              Location:         Vial 100
Acq Operator:  TNB                       Inj. No.:        1
                                           Inj. Vol.:       35 µl
=====

```

```

Acq. Method:   CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:  11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       2.000000
Sample Amount:  0.000
=====

```

```

=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.136	BBA	97613.7	5.8383	Perchlorate

Not REPORTED

83/85 RATIO FAILS

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.140	PBA	44068.5	8.4799	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.153	BBA	122991.7	10.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\23DEC19D\23DECD33.D

Sample Name: 689664 CCV@25

Injection Date: 12/23/2019 15:46:07

Seq Line: 33

Sample Name: 689664 CCV@25

Location: Vial 71

Acq Operator: TNB

Inj. No.: 1

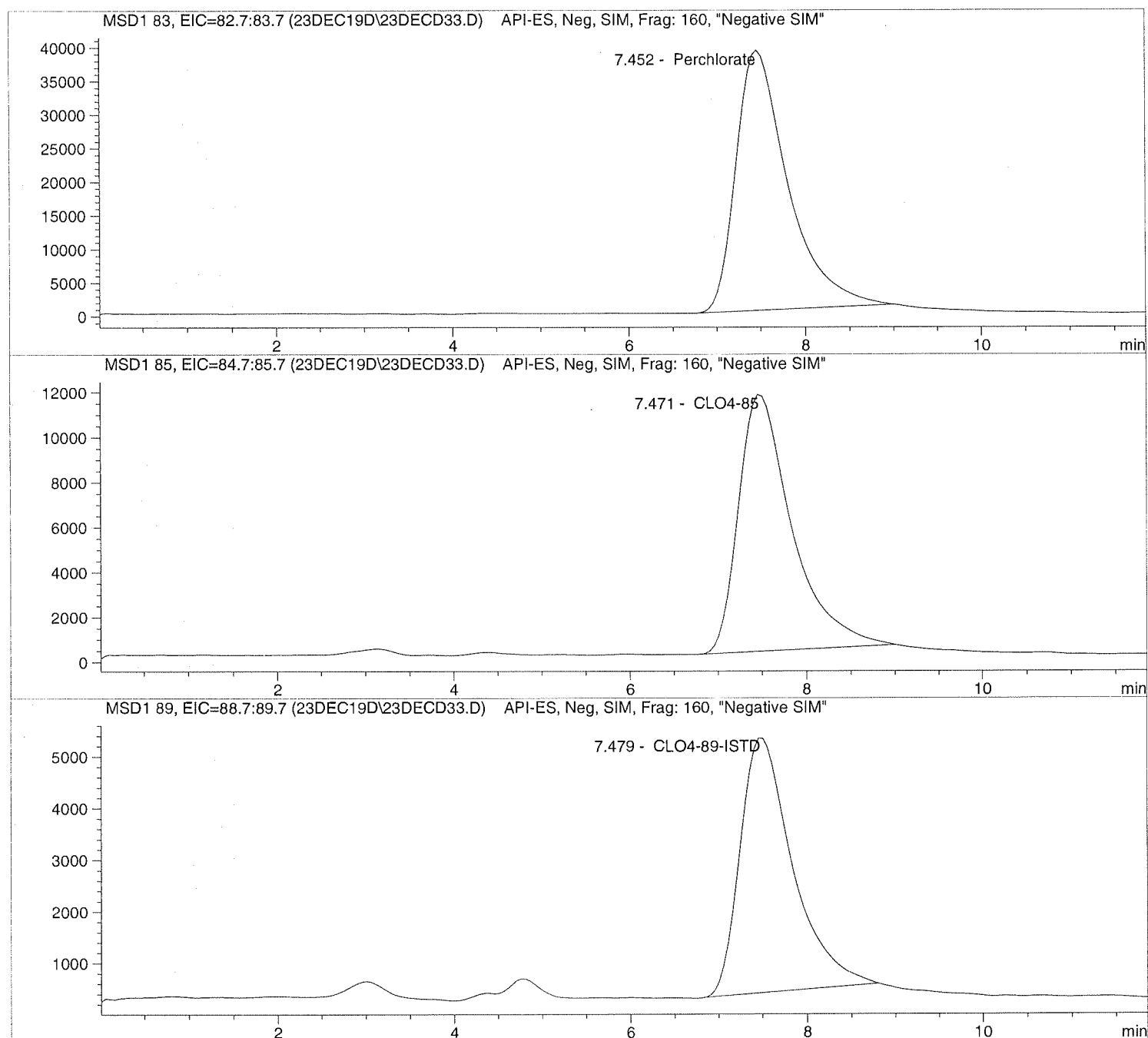
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M

Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23DEC19D\23DECD33.D Sample Name: 689664 CCV@25

Injection Date: 12/23/2019 15:46:07 Seq Line: 33
 Sample Name: 689664 CCV@25 Location: Vial 71
 Acq Operator: TNB Inj. No.: 1
 Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M
 Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
 Last Changed: 11/5/2019 08:44:45

Perchlorate analysis

Sample Information

Sorted By: Signal
 Calib. Data Modified: Mon, 23. Sep. 2019, 00:20:59 pm
 Multiplier: 1.000000
 Dilution: 1.000000
 Sample Amount: 25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.452	PBA	1578778.2	26.3191	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.471	PBA	478131.8	26.1673	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.479	PBA	203856.7	5.0000	CLO4-89-ISTD

*** End of Report ***



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Initial Calibration

=====
 Calibration Table
 =====

Perchlorate

Calib. Data Modified : 9/23/2019 12:20:59 PM

Calculate : Internal Standard
 Based on : Peak Area

Rel. Reference Window : 20.000 %
 Abs. Reference Window : 0.000 min
 Rel. Non-ref. Window : 20.000 %
 Abs. Non-ref. Window : 0.000 min

Use Multiplier & Dilution Factor with ISTDs

Uncalibrated Peaks : not reported
 Partial Calibration : No recalibration if peaks missing

Curve Type : Quadratic (some peaks differ, see below)
 Origin : Ignored (some peaks differ, see below)
 Weight : Linear (Amnt) (some peaks differ, see below)

Recalibration Settings:
 Average Response : Average all calibrations
 Average Retention Time: Floating Average New 75%

Calibration Report Options :
 Printout of recalibrations within a sequence:
 Calibration Table after Recalibration
 Normal Report after Recalibration
 If the sequence is done with bracketing:
 Results of first cycle (ending previous bracket)

Default Sample ISTD Information (if not set in sample table):

ISTD #	ISTD Amount	Name
1	5.00000	CLO4-89-ISTD

Signal 1: MSD1 83, EIC=82.7:83.7
 Signal 2: MSD1 85, EIC=84.7:85.7
 Signal 3: MSD1 89, EIC=88.7:89.7

RetTime [min]	Lvl	Amount	Area	Amt/Area	Ref	Grp	Name
7.750	1	3	1.00000	5.39218e4	1.85454e-5	1	Perchlorate
		4	2.00000	1.32825e5	1.50574e-5		
		5	5.00000	2.76271e5	1.80982e-5		
		6	10.00000	5.61298e5	1.78159e-5		
		7	25.00000	1.51820e6	1.64669e-5		
		8	50.00000	3.31156e6	1.50986e-5		
		9	75.00000	5.23914e6	1.43153e-5		
7.767	3	3	5.00000	2.14568e5	2.33026e-5	+I1	CLO4-89-ISTD
		4	5.00000	2.04758e5	2.44190e-5		
		5	5.00000	2.13407e5	2.34294e-5		
		6	5.00000	2.09246e5	2.38953e-5		
		7	5.00000	2.07403e5	2.41077e-5		
		8	5.00000	2.02929e5	2.46391e-5		
		9	5.00000	1.97933e5	2.52611e-5		
7.778	2	3	1.00000	1.70436e4	5.86732e-5	1	CLO4-85
		4	2.00000	4.20754e4	4.75337e-5		
		5	5.00000	9.24707e4	5.40712e-5		
		6	10.00000	1.68622e5	5.93041e-5		
		7	25.00000	4.63724e5	5.39114e-5		
		8	50.00000	9.95933e5	5.02042e-5		

RetTime [min]	Lvl Sig	Amount	Area	Amt/Area	Ref Grp Name
	9	75.00000	1.58066e6	4.74484e-5	

More compound-specific settings:

Compound: Perchlorate

Time Window : From 3.581 min To 11.899 min
 Curve Type : Quadratic
 Origin : Ignored
 Calibration Level Weights:/
 Level 3 : 1
 Level 4 : 0.5
 Level 5 : 0.2
 Level 6 : 0.1
 Level 7 : 0.04
 Level 8 : 0.02
 Level 9 : 0.013333

Compound: CLO4-89-ISTD

Time Window : From 3.581 min To 11.896 min
 Curve Type : Linear
 Origin : Included
 Calibration Level Weights:/
 Level 3 : 1
 Level 4 : 1
 Level 5 : 1
 Level 6 : 1
 Level 7 : 1
 Level 8 : 1
 Level 9 : 1

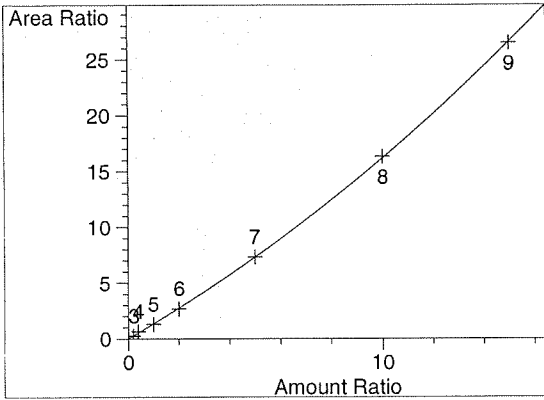
Compound: CLO4-85

Time Window : From 3.601 min To 11.913 min
 Curve Type : Quadratic
 Origin : Ignored
 Calibration Level Weights:/
 Level 3 : 1
 Level 4 : 0.5
 Level 5 : 0.2
 Level 6 : 0.1
 Level 7 : 0.04
 Level 8 : 0.02
 Level 9 : 0.013333

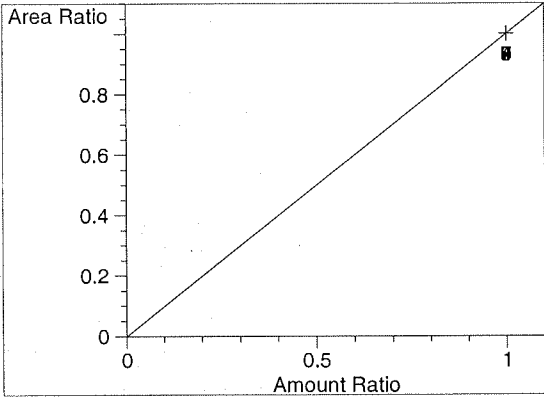
=====
 Peak Sum Table
 =====

No Entries in table
 =====

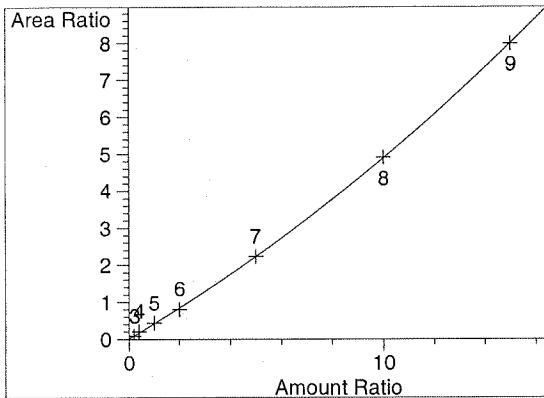
=====
 Calibration Curves
 =====



Perchlorate at exp. RT: 7.750
 MSD1 83, EIC=82.7:83.7
 Correlation: 0.99975
 Residual Std. Dev.: 0.10284
 Formula: $y = ax^2 + bx + c$
 a: 3.10463e-2
 b: 1.30369
 c: 2.19496e-2
 x: Amount Ratio
 y: Area Ratio
 Calibration Level Weights:
 Level 3 : 1
 Level 4 : 0.5
 Level 5 : 0.2
 Level 6 : 0.1
 Level 7 : 0.04
 Level 8 : 0.02
 Level 9 : 0.013333



CLO4-89-ISTD at exp. RT: 7.767
 MSD1 89, EIC=88.7:89.7
 Correlation: 1.00000
 Residual Std. Dev.: 0.00000
 Formula: $y = mx + b$
 m: 1.00000
 b: 0.00000
 x: Amount Ratio
 y: Area Ratio
 Calibration Level Weights:
 Level 3 : 1
 Level 4 : 1
 Level 5 : 1
 Level 6 : 1
 Level 7 : 1
 Level 8 : 1
 Level 9 : 1



CLO4-85 at exp. RT: 7.778
 MSD1 85, EIC=84.7:85.7
 Correlation: 0.99969
 Residual Std. Dev.: 0.02601
 Formula: $y = ax^2 + bx + c$
 a: 8.85207e-3
 b: 3.99283e-1
 c: 1.33505e-2
 x: Amount Ratio
 y: Area Ratio
 Calibration Level Weights:
 Level 3 : 1
 Level 4 : 0.5
 Level 5 : 0.2
 Level 6 : 0.1
 Level 7 : 0.04
 Level 8 : 0.02
 Level 9 : 0.013333

Batch Review Method:

C:\HPCHEM\1\METHODS\CLO4-DP3.M

['#' ==> Run has not been reprocessed with Batch Review Method

['*' ==> Run has been saved with batch file]

#*	Sample	Location	Inj	SampleType	Run	Perchlorate Area	Perchlorat RT	Perchlorate Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	5.39218e4	7.750	8.75982e-1
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	1.32825e5	7.797	2.37682
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	2.76271e5	7.770	4.77237
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	5.61298e5	7.785	9.75097
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	1.51820e6	7.741	25.01082
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	3.31156e6	7.775	50.40300
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	5.23914e6	7.736	74.79107
#*	ICAL Verf@10ug/L	Vial 80	1	Control	11	5.74879e5	7.756	10.11855

#*	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	2.14568e5	7.767	5.00000
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	2.04758e5	7.816	5.00000
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	2.13407e5	7.793	5.00000
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	2.09246e5	7.798	5.00000
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	2.07403e5	7.763	5.00000
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	2.02929e5	7.800	5.00000
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	1.97933e5	7.765	5.00000
#*	ICAL Verf@10ug/L	Vial 80	1	Control	11	2.06243e5	7.776	5.00000

#*	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	1.70436e4	7.778	8.24488e-1
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	4.20754e4	7.805	2.38090
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	9.24707e4	7.787	5.14166
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	1.68622e5	7.781	9.52209
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	4.63724e5	7.760	25.04916
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	9.95933e5	7.793	50.14223
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	1.58066e6	7.758	74.93659
#*	ICAL Verf@10ug/L	Vial 80	1	Control	11	1.71000e5	7.760	9.79043

*** End of Report ***

Sequence Table:

Method and Injection Info Part:

Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
====	=====	=====	=====	===	=====	=====	=====
1	Vial 71	CLO4@ 0.2ug/L	CLO4-AQN 1		Ctrl Samp		
2	Vial 72	CLO4@ 0.5ug/L	CLO4-AQN 1		Ctrl Samp		
3	Vial 73	CLO4@ 1.0ug/L	CLO4-AQN 1		Ctrl Samp		
4	Vial 74	CLO4@ 2.0ug/L	CLO4-AQN 1		Ctrl Samp		
5	Vial 75	CLO4@ 5.0ug/L	CLO4-AQN 1		Ctrl Samp		
6	Vial 76	CLO4@ 10.ug/L	CLO4-AQN 1		Ctrl Samp		
7	Vial 77	CLO4@ 25.ug/L	CLO4-AQN 1		Ctrl Samp		
8	Vial 78	CLO4@ 50.ug/L	CLO4-AQN 1		Ctrl Samp		
9	Vial 79	CLO4@ 75.ug/L	CLO4-AQN 1		Ctrl Samp		
10	Vial 71	CLO4@ 0.2ug/L	CLO4-AQN 1		Ctrl Samp		
11	Vial 80	ICAL Verf@10ug/L	CLO4-AQN 1		Ctrl Samp		

Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI03.D

Sample Name: CLO4@ 1.0ug/L

Injection Date: 9/20/2019 09:24:05

Seq Line: 3

Sample Name: CLO4@ 1.0ug/L

Location: Vial 73

Acq Operator: TNB

Inj. No.: 1

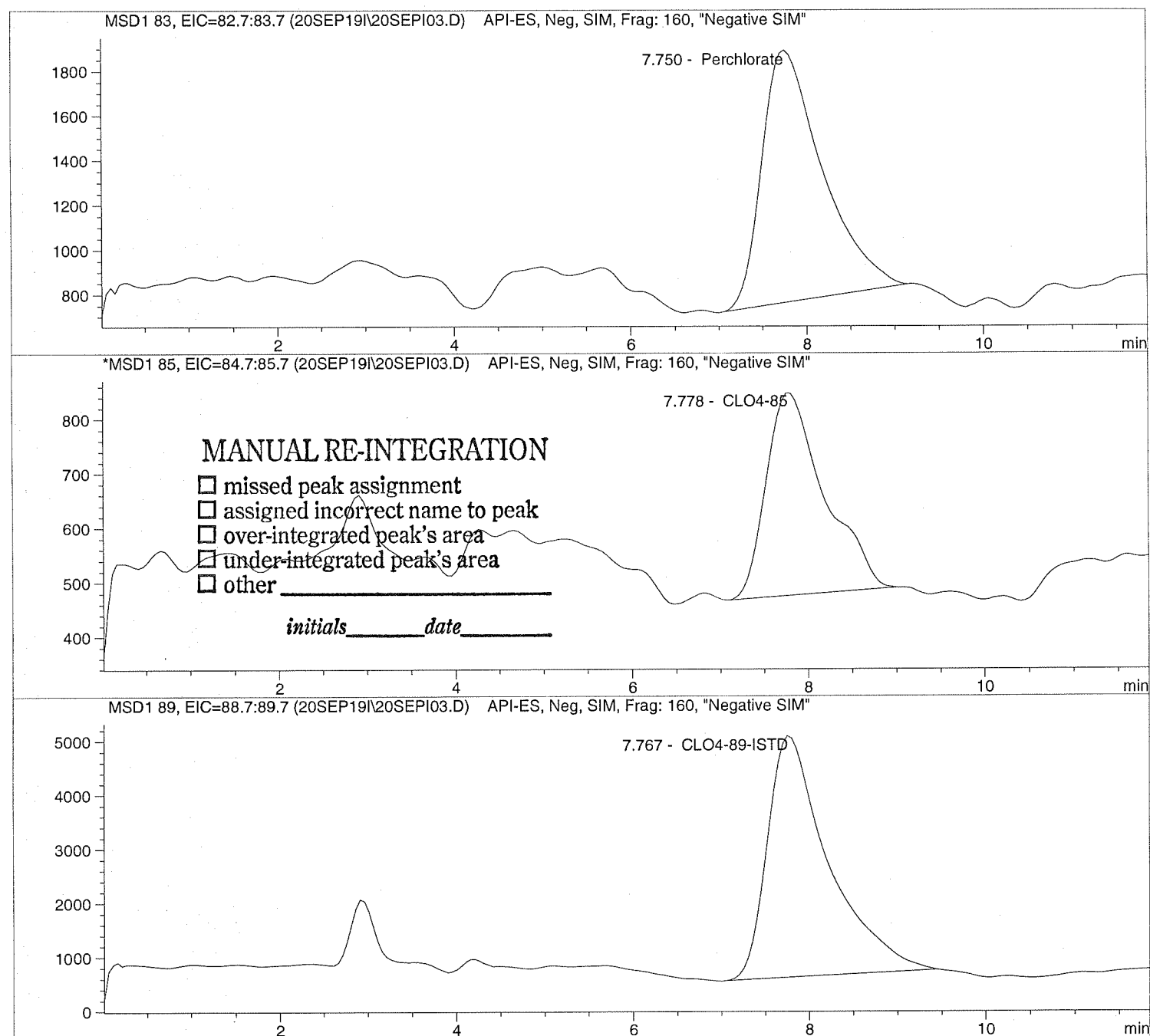
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M

Last Changed: 9/23/2019 12:21:47

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI03.D

Sample Name: CLO4@ 1.0ug/L

```

=====
Injection Date: 9/20/2019 09:24:05      Seq Line:          3
Sample Name:   CLO4@ 1.0ug/L           Location:         Vial 73
Acq Operator:  TNB                     Inj. No.:        1
                                           Inj. Vol.:       30 µl

```

```

Acq. Method:   CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:  9/23/2019 12:21:47

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:    1.000000
Dilution:      1.000000
Sample Amount: 1.000

```

```

=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.750	PBA	53921.8	0.8760	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.778	MM	17043.6	0.8245	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.767	PBA	214568.1	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\20SEP19\20SEPI04.D

Sample Name: CLO4@ 2.0ug/L

Injection Date: 9/20/2019 09:37:58

Seq Line: 4

Sample Name: CLO4@ 2.0ug/L

Location: Vial 74

Acq Operator: TNB

Inj. No.: 1

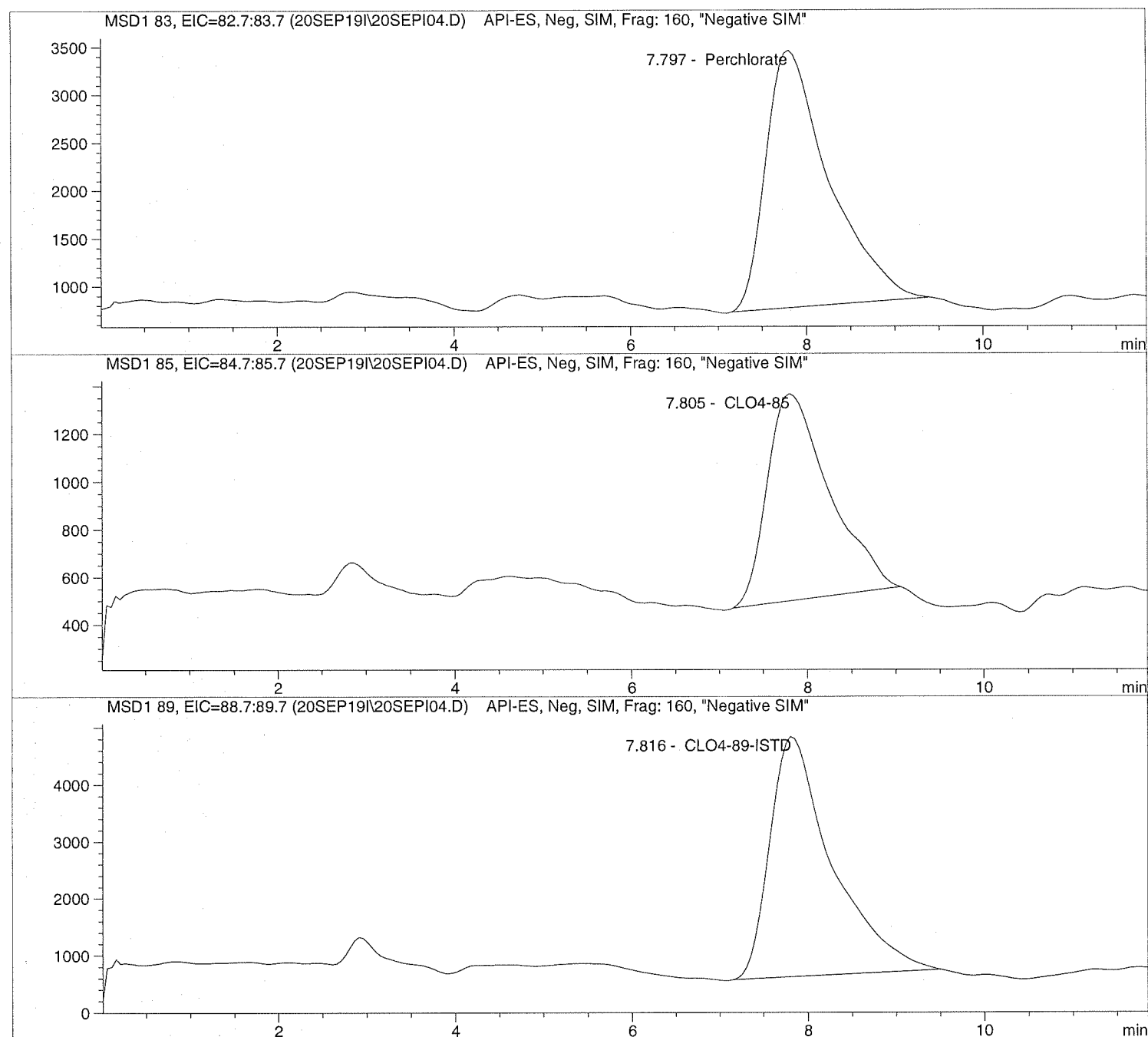
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M

Last Changed: 9/23/2019 12:21:47

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI04.D

Sample Name: CLO4@ 2.0ug/L

```

=====
Injection Date: 9/20/2019 09:37:58      Seq Line:      4
Sample Name:   CLO4@ 2.0ug/L           Location:      Vial 74
Acq Operator:  TNB                     Inj. No.:     1
                                           Inj. Vol.:    30 µl
=====

```

```

Acq. Method:   CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:  9/23/2019 12:21:47
=====

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:    1.000000
Dilution:      1.000000
Sample Amount: 2.000
=====

```

```

=====
                          LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.797	PBA	132825.2	2.3768	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.805	PBA	42075.4	2.3809	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.816	PBA	204758.3	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI05.D

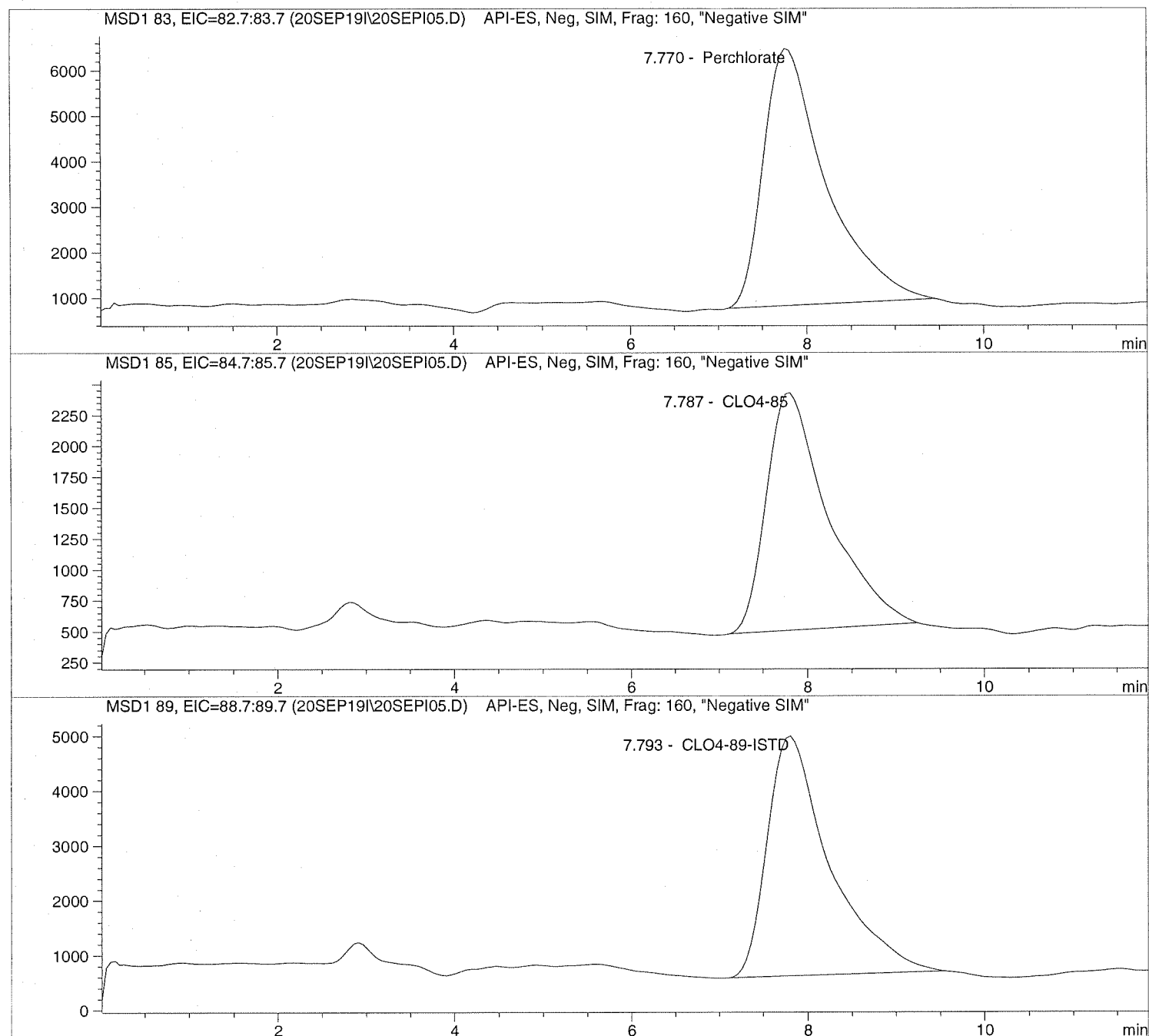
Sample Name: CLO4@ 5.0ug/L

Injection Date: 9/20/2019 09:51:49
Sample Name: CLO4@ 5.0ug/L
Acq Operator: TNB

Seq Line: 5
Location: Vial 75
Inj. No.: 1
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:21:47

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI05.D Sample Name: CLO4@ 5.0ug/L

```

=====
Injection Date: 9/20/2019 09:51:49      Seq Line:      5
Sample Name:    CLO4@ 5.0ug/L           Location:      Vial 75
Acq Operator:   TNB                     Inj. No.:     1
                                           Inj. Vol.:    30 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   9/23/2019 12:21:47
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  5.000
=====

```

```

=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.770	PBA	276270.7	4.7724	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.787	PBA	92470.7	5.1417	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.793	PBA	213407.0	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```


Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI06.D

Sample Name: CLO4@ 10.ug/L

Injection Date: 9/20/2019 10:05:36

Seq Line: 6

Sample Name: CLO4@ 10.ug/L

Location: Vial 76

Acq Operator: TNB

Inj. No.: 1

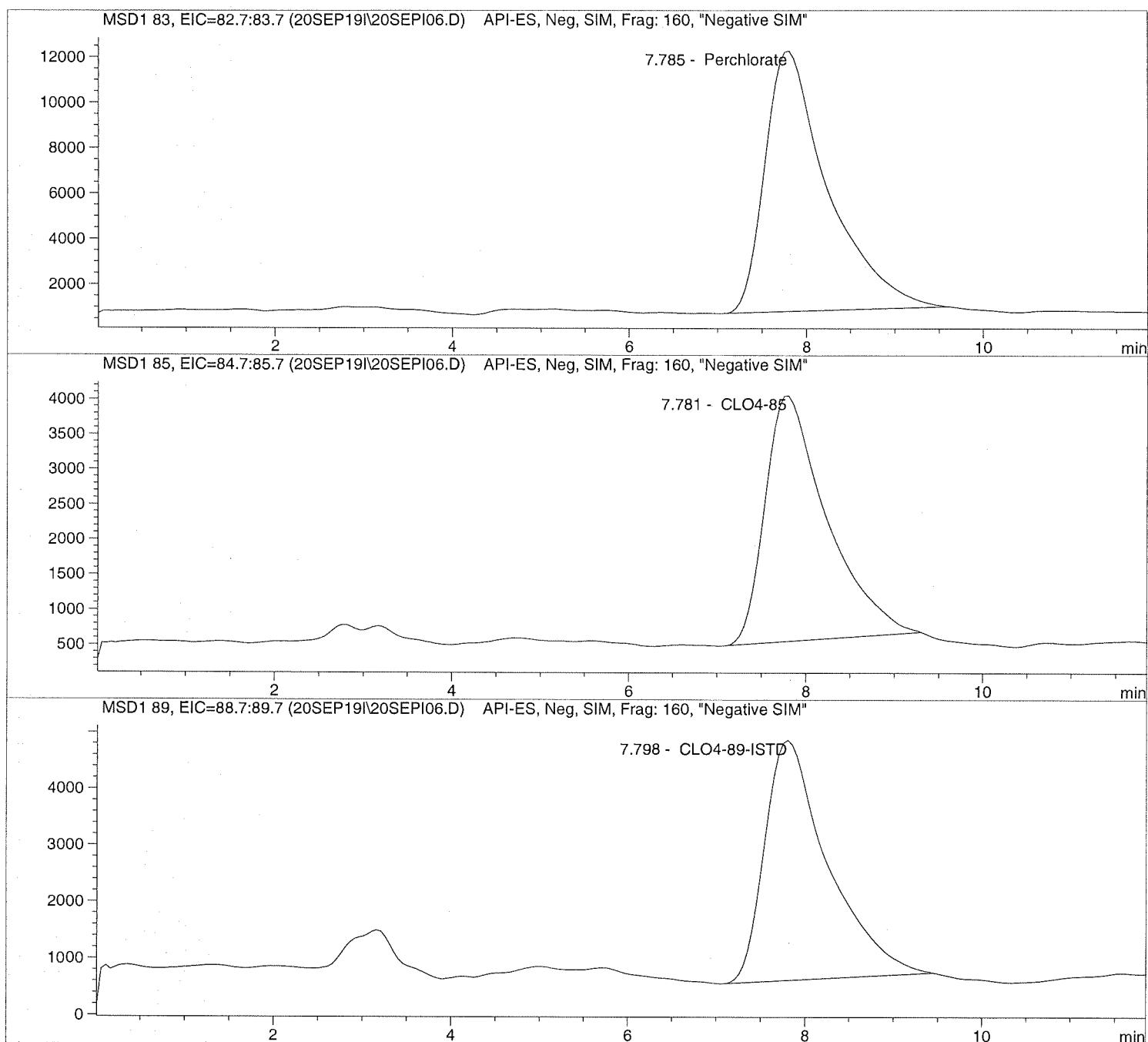
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M

Last Changed: 9/23/2019 12:21:47

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI06.D Sample Name: CLO4@ 10.ug/L

```
=====
Injection Date: 9/20/2019 10:05:36      Seq Line:           6
Sample Name:    CLO4@ 10.ug/L           Location:           Vial 76
Acq Operator:   TNB                     Inj. No.:          1
                                           Inj. Vol.:         30 µl
=====
```

```
Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   9/23/2019 12:21:47
=====
```

Perchlorate analysis

Sample Information

```
=====
Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  10.000
=====
```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.785	PBA	561297.7	9.7510	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.781	PBA	168622.4	9.5221	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.798	PBA	209246.3	5.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI07.D

Sample Name: CLO4@ 25.ug/L

Injection Date: 9/20/2019 10:19:23

Seq Line: 7

Sample Name: CLO4@ 25.ug/L

Location: Vial 77

Acq Operator: TNB

Inj. No.: 1

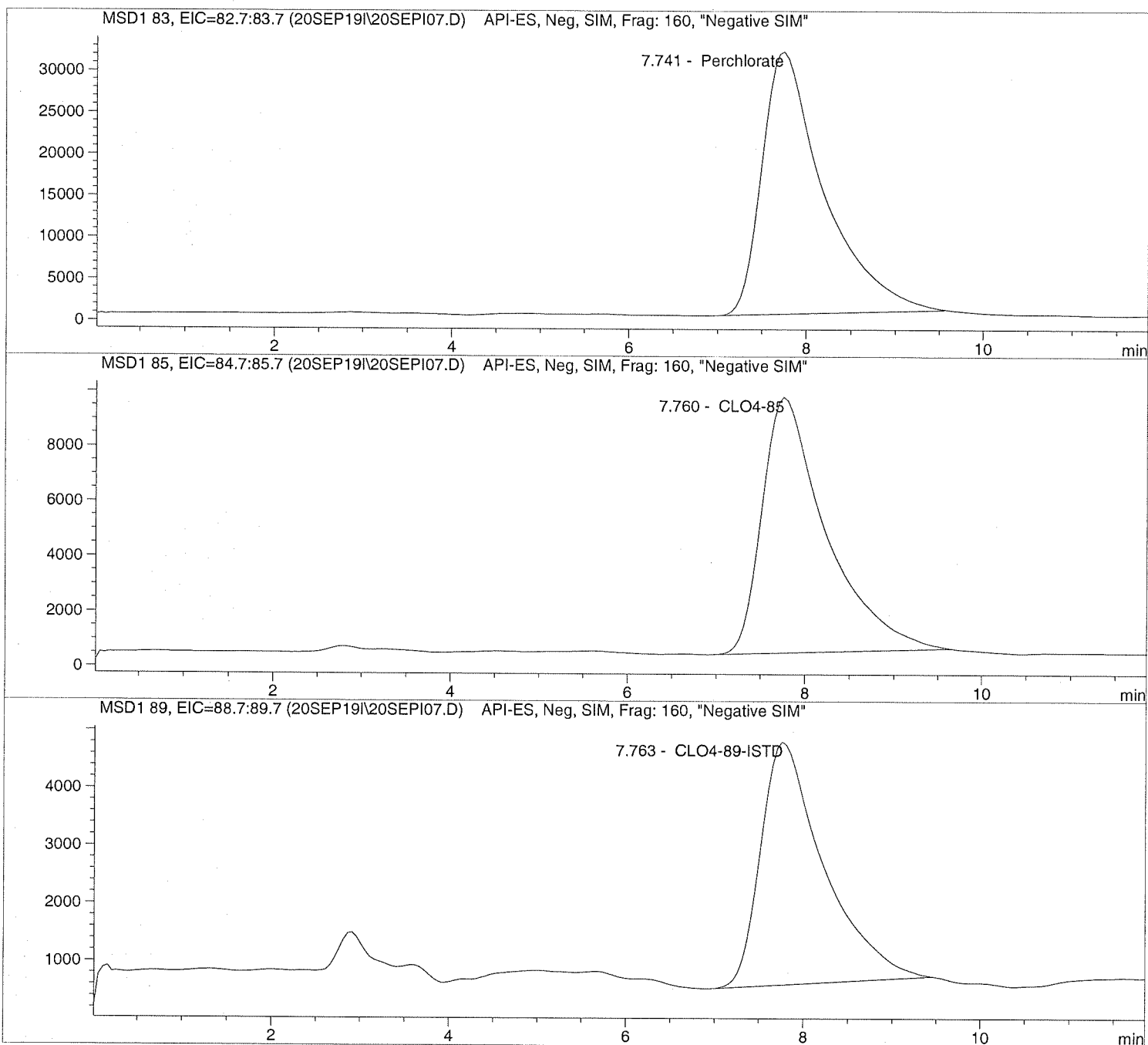
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M

Last Changed: 9/23/2019 12:21:47

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI07.D Sample Name: CLO4@ 25.ug/L

```
=====
Injection Date: 9/20/2019 10:19:23      Seq Line:          7
Sample Name:    CLO4@ 25.ug/L           Location:          Vial 77
Acq Operator:   TNB                     Inj. No.:         1
                                           Inj. Vol.:        30 µl
=====
```

```
Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   9/23/2019 12:21:47
```

Perchlorate analysis

Sample Information

```
=====
Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  25.000
=====
```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.741	PBA	1518197.9	25.0108	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.760	PBA	463724.0	25.0492	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.763	PBA	207402.8	5.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\20SEP19\20SEPI08.D

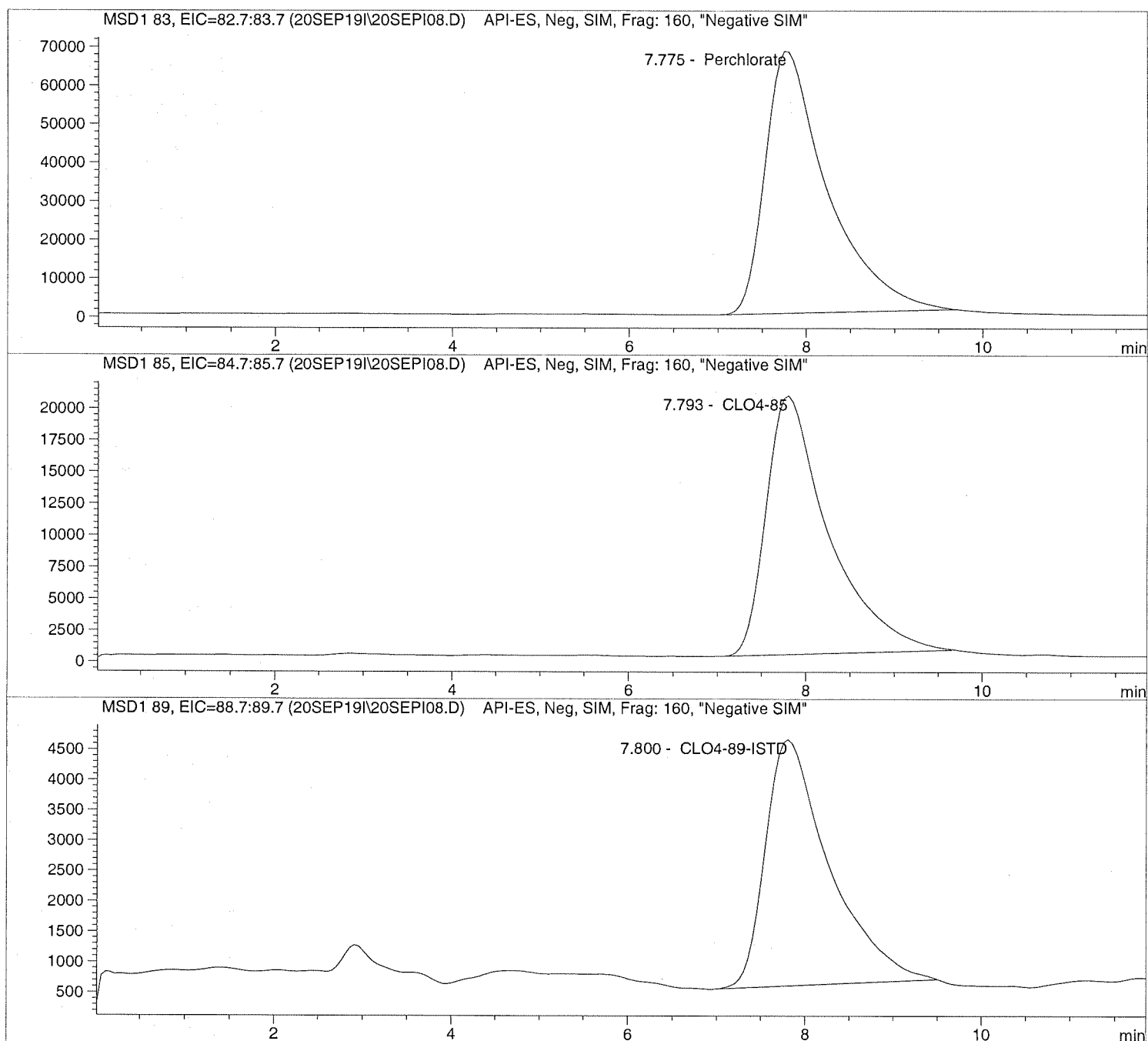
Sample Name: CLO4@ 50.ug/L

Injection Date: 9/20/2019 10:33:18
Sample Name: CLO4@ 50.ug/L
Acq Operator: TNB

Seq Line: 8
Location: Vial 78
Inj. No.: 1
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:21:47

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI08.D Sample Name: CLO4@ 50.ug/L

```

=====
Injection Date: 9/20/2019 10:33:18      Seq Line:      8
Sample Name:   CLO4@ 50.ug/L           Location:      Vial 78
Acq Operator:  TNB                     Inj. No.:     1
                                           Inj. Vol.:    30 µl
=====

```

```

Acq. Method:   CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:  9/23/2019 12:21:47
=====

```

Perchlorate analysis

Sample Information

```

=====
Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:    1.000000
Dilution:     1.000000
Sample Amount: 50.000
=====

```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.775	PBA	3311559.2	50.4030	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.793	PBA	995933.0	50.1422	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.800	PBA	202929.2	5.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI09.D

Sample Name: CLO4@ 75.ug/L

Injection Date: 9/20/2019 10:47:05

Seq Line: 9

Sample Name: CLO4@ 75.ug/L

Location: Vial 79

Acq Operator: TNB

Inj. No.: 1

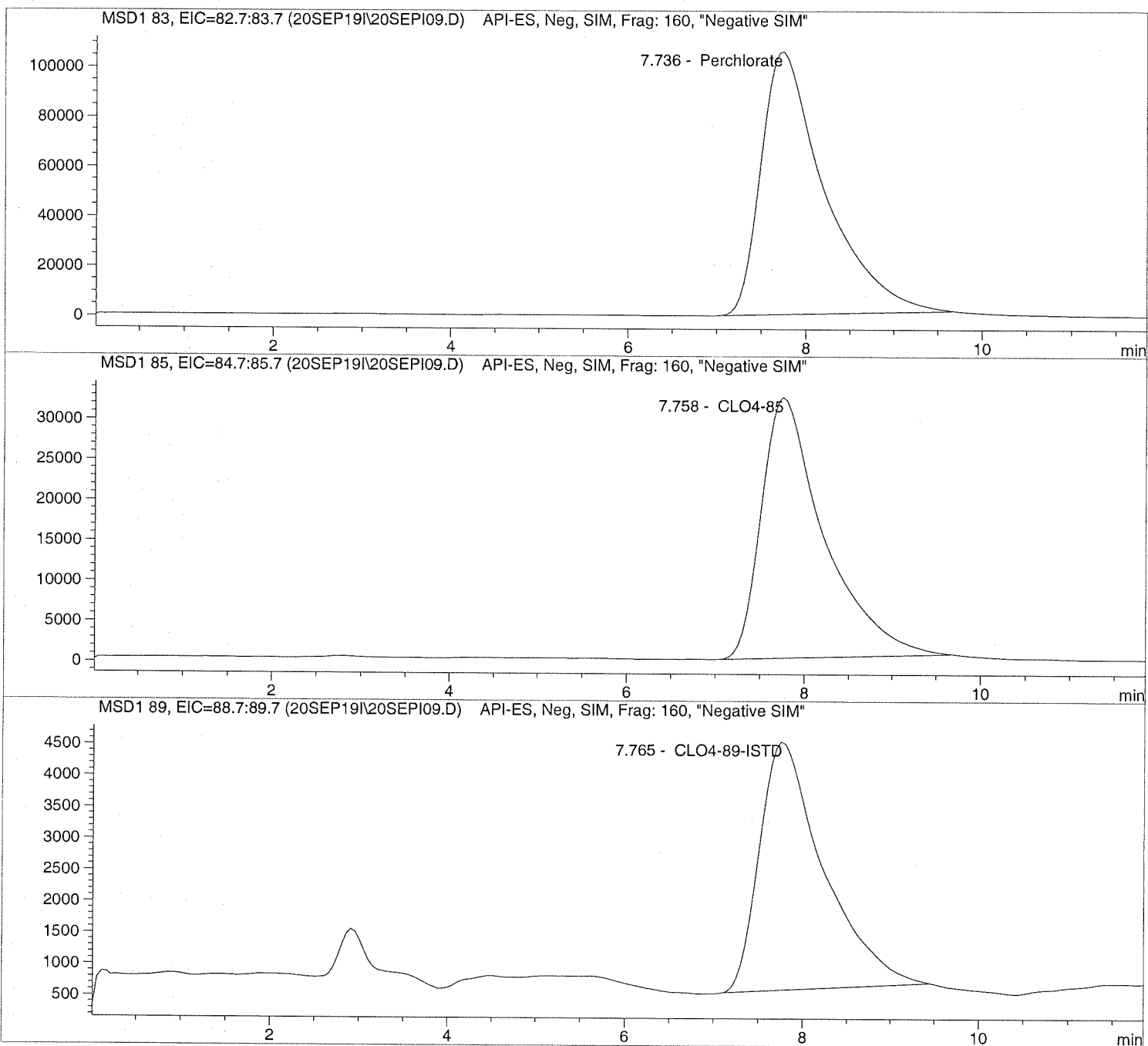
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M

Last Changed: 9/23/2019 12:21:47

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI09.D Sample Name: CLO4@ 75.ug/L

```
=====
Injection Date: 9/20/2019 10:47:05      Seq Line:          9
Sample Name:    CLO4@ 75.ug/L           Location:          Vial 79
Acq Operator:   TNB                     Inj. No.:         1
                                           Inj. Vol.:        30 µl
=====
```

```
Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   9/23/2019 12:21:47
=====
```

Perchlorate analysis

Sample Information

```
=====
Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  75.000
=====
```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.736	PBA	5239145.0	74.7911	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.758	PBA	1580664.2	74.9366	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.765	PBA	197932.5	5.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI11.D

Sample Name: ICAL Verf@10ug/L

Injection Date: 9/20/2019 11:14:45

Seq Line: 11

Sample Name: ICAL Verf@10ug/L

Location: Vial 80

Acq Operator: TNB

Inj. No.: 1

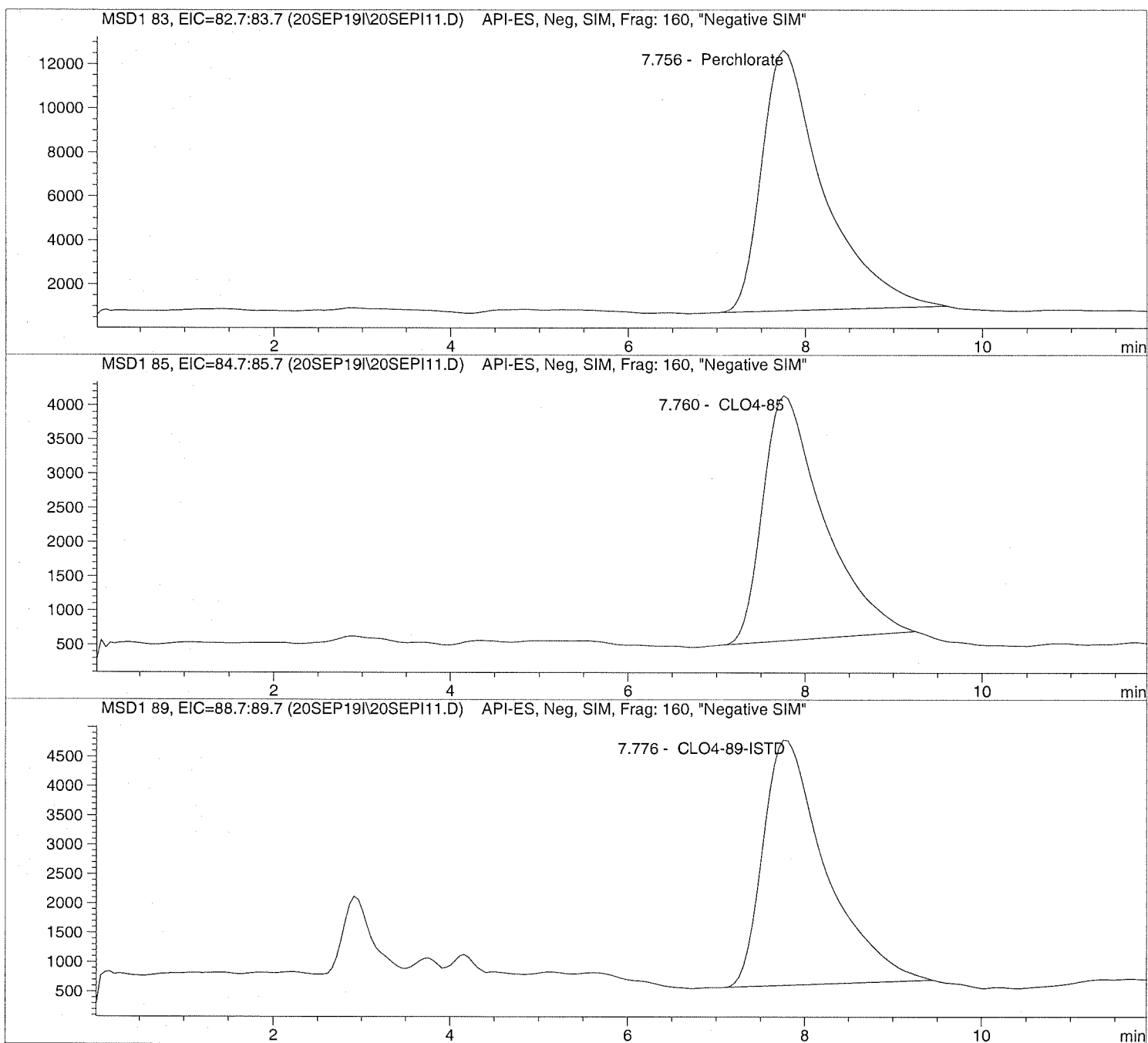
Inj. Vol.: 30 μ l

Acq. Method: CLO4-AQN.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M

Last Changed: 9/23/2019 12:21:47

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI11.D Sample Name: ICAL Verf@10ug/L

```

=====
Injection Date: 9/20/2019 11:14:45      Seq Line:      11
Sample Name:   ICAL Verf@10ug/L        Location:      Vial 80
Acq Operator:  TNB                      Inj. No.:     1
                                           Inj. Vol.:    30 µl
=====

```

```

Acq. Method:   CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:  9/23/2019 12:21:47
=====

```

Perchlorate analysis

Sample Information

```

=====
Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:    1.000000
Dilution:     1.000000
Sample Amount: 10.000
=====

```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.756	PBA	574879.4	10.1185	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.760	PBA	171000.4	9.7904	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.776	PBA	206243.3	5.0000	CLO4-89-ISTD

*** End of Report ***



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Unmodified

Data file: C:\HPCHEM\1\DATA\20SEP19\20SEPI03.D

Sample Name: CLO4@ 1.0ug/L

Injection Date: 9/20/2019 09:24:05

Seq Line: 3

Sample Name: CLO4@ 1.0ug/L

Location: Vial 73

Acq Operator: TNB

Inj. No.: 1

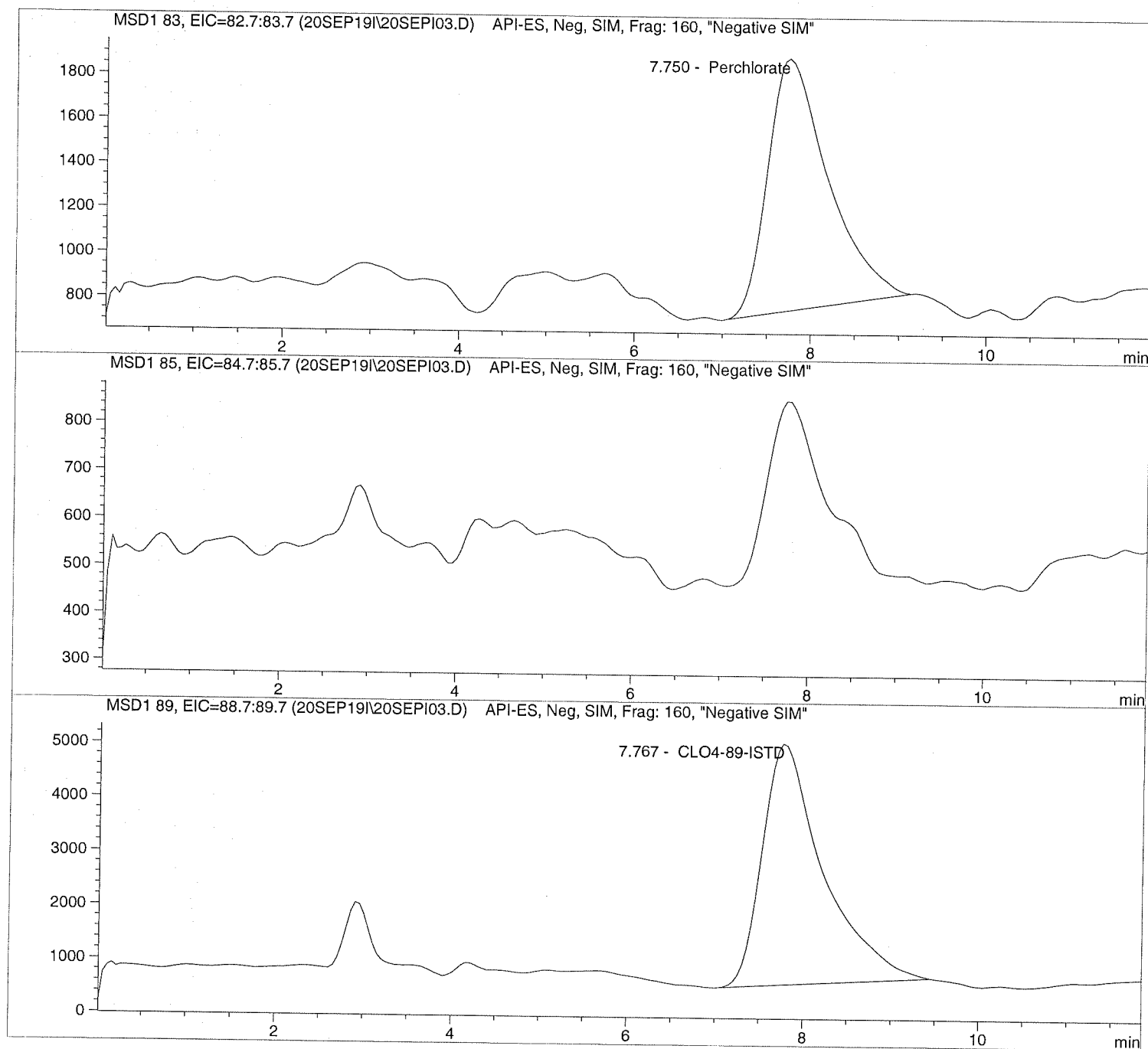
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M

Last Changed: 9/23/2019 12:27:11

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI03.D

Sample Name: CLO4@ 1.0ug/L

```

=====
Injection Date: 9/20/2019 09:24:05      Seq Line: 3
Sample Name:    CLO4@ 1.0ug/L           Location:  Vial 73
Acq Operator:   TNB                     Inj. No.:  1
                                           Inj. Vol.: 30 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   9/23/2019 12:27:11
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  1.000
=====

```

```

=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.750	PBA	53921.8	0.8760	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.767	PBA	214568.1	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\23DEC19D\23DECD21.D

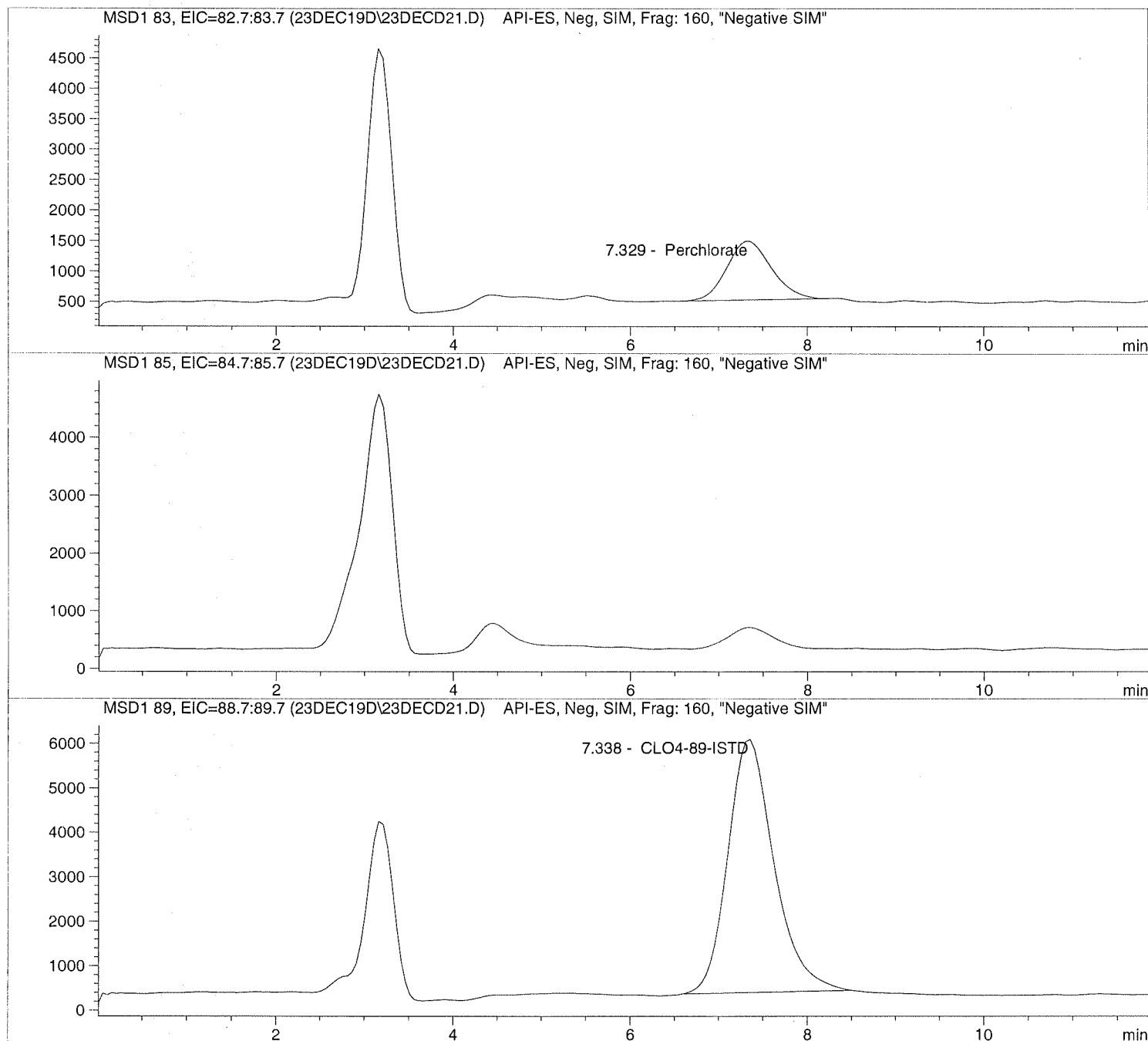
Sample Name: 1935347006

Injection Date: 12/23/2019 12:49:23
Sample Name: 1935347006
Acq Operator: TNB

Seq Line: 21
Location: Vial 90
Inj. No.: 1
Inj. Vol.: 35 μ l

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23DEC19D\23DECD21.D Sample Name: 1935347006

```

=====
Injection Date: 12/23/2019 12:49:23      Seq Line:          21
Sample Name:    1935347006                Location:          Vial 90
Acq Operator:   TNB                       Inj. No.:         1
                                           Inj. Vol.:        35 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  0.000
=====

```

```

=====
                          LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.329	PBA	33750.8	0.5414	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.338	BBA	206441.3	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

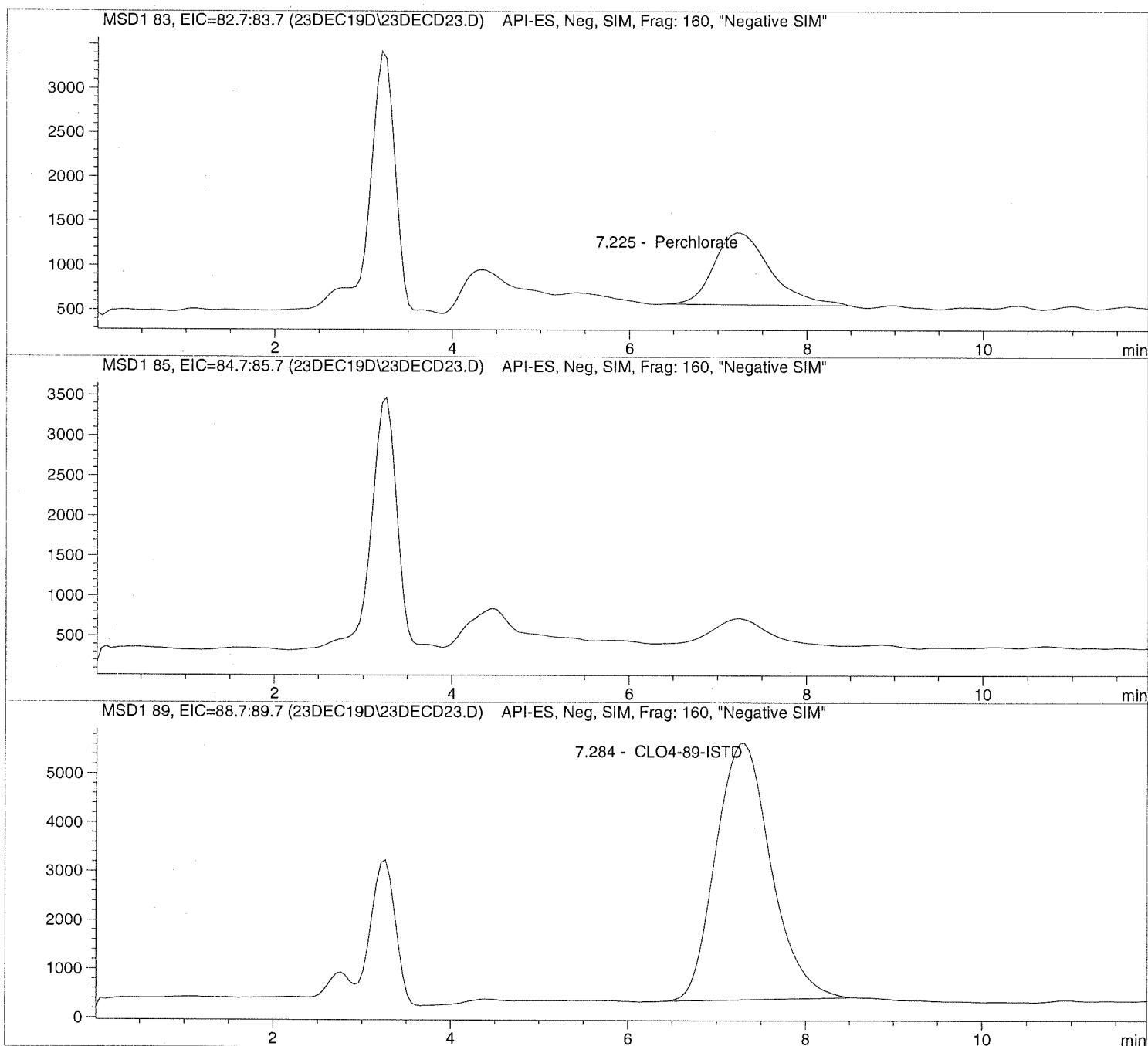
```

Data file: C:\HPCHEM\1\DATA\23DEC19D\23DECD23.D Sample Name: 1935366001

```
=====
Injection Date: 12/23/2019 13:17:14      Seq Line:      23
Sample Name:    1935366001                Location:      Vial 92
Acq Operator:   TNB                       Inj. No.:     1
                                           Inj. Vol.:    35 µl
=====
```

```
Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   11/5/2019 08:44:45
```

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23DEC19D\23DECD23.D Sample Name: 1935366001

```

=====
Injection Date: 12/23/2019 13:17:14      Seq Line:          23
Sample Name:    1935366001                Location:          Vial 92
Acq Operator:   TNB                       Inj. No.:         1
                                           Inj. Vol.:        35 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   11/5/2019 08:44:45
=====

```

Perchlorate analysis

Sample Information

```

=====
Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  0.000
=====

```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.225	PBA	35581.3	0.5167	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.284	PBA	226617.1	5.0000	CLO4-89-ISTD

*** End of Report ***



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

January 05, 2020

Marcia Olive
Bhate Environmental Associates, Inc.
445 Union Blvd Ste 129
Lakewood, CO 80228

Work Order: **HS19120765**

Laboratory Results for: **LHAAP/Site 18/24**

Dear Marcia,

ALS Environmental received 11 sample(s) on Dec 13, 2019 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: **RJ.MODASHIA**
RJ Modashia
Project Manager

ALS Houston, US

Date: 05-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: LHAAP/Site 18/24
Work Order: HS19120765

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19120765-01	18WW22_121219	Groundwater		12-Dec-2019 08:05	13-Dec-2019 09:00	<input type="checkbox"/>
HS19120765-02	18WW22_121219_a	Groundwater		12-Dec-2019 08:05	13-Dec-2019 09:00	<input type="checkbox"/>
HS19120765-03	C08_121219	Groundwater		12-Dec-2019 09:00	13-Dec-2019 09:00	<input type="checkbox"/>
HS19120765-04	18CPTMW24_121219	Groundwater		12-Dec-2019 09:50	13-Dec-2019 09:00	<input type="checkbox"/>
HS19120765-05	18CPTMW07_121219	Groundwater		12-Dec-2019 10:45	13-Dec-2019 09:00	<input type="checkbox"/>
HS19120765-06	109_121219	Groundwater		12-Dec-2019 11:35	13-Dec-2019 09:00	<input type="checkbox"/>
HS19120765-07	MW3_121219	Groundwater		12-Dec-2019 12:30	13-Dec-2019 09:00	<input type="checkbox"/>
HS19120765-08	MW23_121219	Groundwater		12-Dec-2019 13:20	13-Dec-2019 09:00	<input type="checkbox"/>
HS19120765-09	MW23_121219_a	Groundwater		12-Dec-2019 13:20	13-Dec-2019 09:00	<input type="checkbox"/>
HS19120765-10	125_121219	Groundwater		12-Dec-2019 13:40	13-Dec-2019 09:00	<input type="checkbox"/>
HS19120765-11	Trip Blank	Water	CG 111519 -130	12-Dec-2019 00:00	13-Dec-2019 09:00	<input type="checkbox"/>

Revision:1

ALS Houston, US

Date: 05-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: LHAAP/Site 18/24
Work Order: HS19120765

CASE NARRATIVE

Work Order Comments

- Revised to updated the sample ID for sample #1 & 2 to 18WW22
-

Work Order Comments

- The analysis for Perchlorate was subcontracted to ALS Environmental in Salt Lake City, UT. Final report attached.
-

GCMS Semivolatiles by Method SW8270SIM**Batch ID: 148874****Sample ID: LCSD-148874**

- LCS/LCSD RPD was above the control limits
-

GCMS Volatiles by Method SW8260**Batch ID: R352792****Sample ID: 18MW22_121219(HS19120765-01MS)**

- MS/MSD failed QC limits for some compounds.
-

Metals by Method SW6020**Batch ID: 149105****Sample ID: HS19120702-03MS**

- MS/MSD adn DUPs are for an unrelated sample
-

Metals by Method SW7470**Batch ID: 149099**

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

ALS Houston, US

Date: 05-Jan-20

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP/Site 18/24
 Sample ID: 18WW22_121219
 Collection Date: 12-Dec-2019 08:05

ANALYTICAL REPORT

WorkOrder:HS19120765
 Lab ID:HS19120765-01
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED	
VOLATILES ORGANICS BY METHOD		Method:SW8260							Analyst: PC
8260C									
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 12:50	
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 12:50	
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	17-Dec-2019 12:50	
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 12:50	
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 12:50	
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 12:50	
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 12:50	
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	17-Dec-2019 12:50	
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	17-Dec-2019 12:50	
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	17-Dec-2019 12:50	
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 12:50	
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 12:50	
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 12:50	
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	17-Dec-2019 12:50	
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 12:50	
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	17-Dec-2019 12:50	
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 12:50	
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	17-Dec-2019 12:50	
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 12:50	
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	17-Dec-2019 12:50	
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 12:50	
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	17-Dec-2019 12:50	
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 12:50	
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	17-Dec-2019 12:50	
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	17-Dec-2019 12:50	
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 12:50	
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	17-Dec-2019 12:50	
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	17-Dec-2019 12:50	
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 12:50	
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	17-Dec-2019 12:50	
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 12:50	
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 12:50	
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	17-Dec-2019 12:50	
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	17-Dec-2019 12:50	
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	17-Dec-2019 12:50	
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	17-Dec-2019 12:50	
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 12:50	
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 12:50	
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 12:50	

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

Revision: 1

ALS Houston, US

Date: 05-Jan-20

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP/Site 18/24
 Sample ID: 18WW22_121219
 Collection Date: 12-Dec-2019 08:05

ANALYTICAL REPORT

WorkOrder:HS19120765
 Lab ID:HS19120765-01
 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	17-Dec-2019 12:50	
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 12:50	
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	17-Dec-2019 12:50	
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 12:50	
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 12:50	
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 12:50	
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 12:50	
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	UG/L	1	17-Dec-2019 12:50	
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 12:50	
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	17-Dec-2019 12:50	
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	17-Dec-2019 12:50	
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	17-Dec-2019 12:50	
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 12:50	
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 12:50	
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 12:50	
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 12:50	
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 12:50	
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 12:50	
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 12:50	
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 12:50	
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 12:50	
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 12:50	
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 12:50	
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 12:50	
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 12:50	
Surr: 1,2-Dichloroethane-d4	90.3			0	81-118	%REC	1	17-Dec-2019 12:50	
Surr: 4-Bromofluorobenzene	98.8			0	85-114	%REC	1	17-Dec-2019 12:50	
Surr: Dibromofluoromethane	92.1			0	80-119	%REC	1	17-Dec-2019 12:50	
Surr: Toluene-d8	101			0	89-112	%REC	1	17-Dec-2019 12:50	
SEMIVOLATILES SIM		Method:SW8270SIM						Prep:SW3510 / 18-Dec-2019 Analyst: LG	
1,4-Dioxane	0.92		0.050	0.050	0.050	ug/L	5	23-Dec-2019 12:51	
Surr: 2-Fluorobiphenyl	119			0	40-140	%REC	5	23-Dec-2019 12:51	
Surr: 4-Terphenyl-d14	113			0	40-140	%REC	5	23-Dec-2019 12:51	
Surr: Nitrobenzene-d5	119			0	40-140	%REC	5	23-Dec-2019 12:51	

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

Revision: 1

ALS Houston, US

Date: 05-Jan-20

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP/Site 18/24
 Sample ID: 18WW22_121219
 Collection Date: 12-Dec-2019 08:05

ANALYTICAL REPORT

WorkOrder:HS19120765
 Lab ID:HS19120765-01
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A		Method:SW6020				Prep:SW3010A / 24-Dec-2019		Analyst: JHD
Aluminum	0.537		0.00180	0.00500	0.0100	mg/L	1	27-Dec-2019 14:28
Antimony	0.000417	J	0.000400	0.000500	0.00500	mg/L	1	27-Dec-2019 14:28
Arsenic	0.00476	J	0.000400	0.000500	0.00500	mg/L	1	27-Dec-2019 14:28
Barium	0.0862		0.00190	0.00250	0.00500	mg/L	1	27-Dec-2019 14:28
Beryllium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	27-Dec-2019 14:28
Cadmium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	27-Dec-2019 14:28
Calcium	22.8		0.0340	0.0500	0.500	mg/L	1	27-Dec-2019 14:28
Chromium	0.0309		0.000400	0.000500	0.00500	mg/L	1	27-Dec-2019 14:28
Cobalt	0.000444	J	0.000100	0.000500	0.00500	mg/L	1	27-Dec-2019 14:28
Copper	0.00117	J	0.00100	0.00250	0.00500	mg/L	1	27-Dec-2019 14:28
Iron	0.241		0.0120	0.0500	0.200	mg/L	1	27-Dec-2019 14:28
Lead	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	27-Dec-2019 14:28
Magnesium	0.198	J	0.0100	0.0500	0.200	mg/L	1	27-Dec-2019 14:28
Manganese	0.00292	J	0.000700	0.00250	0.00500	mg/L	1	27-Dec-2019 14:28
Nickel	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	27-Dec-2019 14:28
Potassium	6.11		0.0180	0.0500	0.200	mg/L	1	27-Dec-2019 14:28
Selenium	0.00124	J	0.00110	0.00250	0.00500	mg/L	1	27-Dec-2019 14:28
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	27-Dec-2019 14:28
Sodium	59.9		0.0140	0.0500	0.200	mg/L	1	27-Dec-2019 14:28
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	27-Dec-2019 14:28
Vanadium	0.0458		0.000600	0.00100	0.00500	mg/L	1	27-Dec-2019 14:28
Zinc	0.00250	U	0.00200	0.00250	0.00500	mg/L	1	27-Dec-2019 14:28
MERCURY BY SW7470A		Method:SW7470				Prep:SW7470 / 24-Dec-2019		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	24-Dec-2019 17:22
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		Method:NA						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	30-Dec-2019 17:31

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

Revision: 1

ALS Houston, US

Date: 05-Jan-20

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP/Site 18/24
 Sample ID: 18WW22_121219_a
 Collection Date: 12-Dec-2019 08:05

ANALYTICAL REPORT
 WorkOrder:HS19120765
 Lab ID:HS19120765-02
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD		Method:SW8260						
8260C								Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 13:14
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 13:14
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	17-Dec-2019 13:14
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 13:14
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 13:14
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 13:14
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 13:14
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	17-Dec-2019 13:14
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	17-Dec-2019 13:14
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	17-Dec-2019 13:14
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 13:14
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 13:14
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 13:14
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	17-Dec-2019 13:14
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 13:14
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	17-Dec-2019 13:14
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 13:14
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	17-Dec-2019 13:14
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 13:14
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	17-Dec-2019 13:14
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 13:14
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	17-Dec-2019 13:14
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 13:14
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	17-Dec-2019 13:14
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	17-Dec-2019 13:14
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 13:14
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	17-Dec-2019 13:14
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	17-Dec-2019 13:14
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 13:14
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	17-Dec-2019 13:14
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 13:14
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 13:14
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	17-Dec-2019 13:14
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	17-Dec-2019 13:14
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	17-Dec-2019 13:14
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	17-Dec-2019 13:14
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 13:14
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 13:14
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 13:14

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

Revision: 1

ALS Houston, US

Date: 05-Jan-20

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP/Site 18/24
 Sample ID: 18WW22_121219_a
 Collection Date: 12-Dec-2019 08:05

ANALYTICAL REPORT
 WorkOrder:HS19120765
 Lab ID:HS19120765-02
 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	17-Dec-2019 13:14	
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 13:14	
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	17-Dec-2019 13:14	
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 13:14	
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 13:14	
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 13:14	
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 13:14	
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	UG/L	1	17-Dec-2019 13:14	
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 13:14	
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	17-Dec-2019 13:14	
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	17-Dec-2019 13:14	
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	17-Dec-2019 13:14	
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 13:14	
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 13:14	
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 13:14	
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 13:14	
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 13:14	
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 13:14	
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 13:14	
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 13:14	
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 13:14	
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 13:14	
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 13:14	
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 13:14	
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 13:14	
Surr: 1,2-Dichloroethane-d4	90.3			0	81-118	%REC	1	17-Dec-2019 13:14	
Surr: 4-Bromofluorobenzene	97.9			0	85-114	%REC	1	17-Dec-2019 13:14	
Surr: Dibromofluoromethane	93.1			0	80-119	%REC	1	17-Dec-2019 13:14	
Surr: Toluene-d8	102			0	89-112	%REC	1	17-Dec-2019 13:14	
SEMIVOLATILES SIM		Method:SW8270SIM						Prep:SW3510 / 18-Dec-2019 Analyst: LG	
1,4-Dioxane	0.90		0.050	0.050	0.050	ug/L	5	23-Dec-2019 13:10	
Surr: 2-Fluorobiphenyl	62.0			0	40-140	%REC	5	23-Dec-2019 13:10	
Surr: 4-Terphenyl-d14	52.5			0	40-140	%REC	5	23-Dec-2019 13:10	
Surr: Nitrobenzene-d5	98.4			0	40-140	%REC	5	23-Dec-2019 13:10	

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

Revision: 1

ALS Houston, US

Date: 05-Jan-20

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP/Site 18/24
 Sample ID: 18WW22_121219_a
 Collection Date: 12-Dec-2019 08:05

ANALYTICAL REPORT
 WorkOrder:HS19120765
 Lab ID:HS19120765-02
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A		Method:SW6020				Prep:SW3010A / 24-Dec-2019		Analyst: JHD
Aluminum	0.548		0.00180	0.00500	0.0100	mg/L	1	27-Dec-2019 14:30
Antimony	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	27-Dec-2019 14:30
Arsenic	0.00499	J	0.000400	0.000500	0.00500	mg/L	1	27-Dec-2019 14:30
Barium	0.0898		0.00190	0.00250	0.00500	mg/L	1	27-Dec-2019 14:30
Beryllium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	27-Dec-2019 14:30
Cadmium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	27-Dec-2019 14:30
Calcium	23.7		0.0340	0.0500	0.500	mg/L	1	27-Dec-2019 14:30
Chromium	0.0318		0.000400	0.000500	0.00500	mg/L	1	27-Dec-2019 14:30
Cobalt	0.000409	J	0.000100	0.000500	0.00500	mg/L	1	27-Dec-2019 14:30
Copper	0.00104	J	0.00100	0.00250	0.00500	mg/L	1	27-Dec-2019 14:30
Iron	0.0233	J	0.0120	0.0500	0.200	mg/L	1	27-Dec-2019 14:30
Lead	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	27-Dec-2019 14:30
Magnesium	0.201		0.0100	0.0500	0.200	mg/L	1	27-Dec-2019 14:30
Manganese	0.00125	J	0.000700	0.00250	0.00500	mg/L	1	27-Dec-2019 14:30
Nickel	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	27-Dec-2019 14:30
Potassium	6.33		0.0180	0.0500	0.200	mg/L	1	27-Dec-2019 14:30
Selenium	0.00184	J	0.00110	0.00250	0.00500	mg/L	1	27-Dec-2019 14:30
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	27-Dec-2019 14:30
Sodium	62.5		0.0140	0.0500	0.200	mg/L	1	27-Dec-2019 14:30
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	27-Dec-2019 14:30
Vanadium	0.0483		0.000600	0.00100	0.00500	mg/L	1	27-Dec-2019 14:30
Zinc	0.00250	U	0.00200	0.00250	0.00500	mg/L	1	27-Dec-2019 14:30
MERCURY BY SW7470A		Method:SW7470				Prep:SW7470 / 24-Dec-2019		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	24-Dec-2019 17:24
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		Method:NA						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	30-Dec-2019 17:31

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

Revision: 1

ALS Houston, US

Date: 05-Jan-20

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP/Site 18/24
 Sample ID: C08_121219
 Collection Date: 12-Dec-2019 09:00

ANALYTICAL REPORT
 WorkOrder:HS19120765
 Lab ID:HS19120765-03
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD		Method:SW8260						
8260C								Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 13:38
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 13:38
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	17-Dec-2019 13:38
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 13:38
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 13:38
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 13:38
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 13:38
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	17-Dec-2019 13:38
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	17-Dec-2019 13:38
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	17-Dec-2019 13:38
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 13:38
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 13:38
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 13:38
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	17-Dec-2019 13:38
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 13:38
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	17-Dec-2019 13:38
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 13:38
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	17-Dec-2019 13:38
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 13:38
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	17-Dec-2019 13:38
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 13:38
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	17-Dec-2019 13:38
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 13:38
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	17-Dec-2019 13:38
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	17-Dec-2019 13:38
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 13:38
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	17-Dec-2019 13:38
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	17-Dec-2019 13:38
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 13:38
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	17-Dec-2019 13:38
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 13:38
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 13:38
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	17-Dec-2019 13:38
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	17-Dec-2019 13:38
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	17-Dec-2019 13:38
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	17-Dec-2019 13:38
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 13:38
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 13:38
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 13:38

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

Revision: 1

ALS Houston, US

Date: 05-Jan-20

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP/Site 18/24
 Sample ID: C08_121219
 Collection Date: 12-Dec-2019 09:00

ANALYTICAL REPORT
 WorkOrder:HS19120765
 Lab ID:HS19120765-03
 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	17-Dec-2019 13:38	
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 13:38	
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	17-Dec-2019 13:38	
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 13:38	
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 13:38	
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 13:38	
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 13:38	
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	UG/L	1	17-Dec-2019 13:38	
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 13:38	
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	17-Dec-2019 13:38	
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	17-Dec-2019 13:38	
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	17-Dec-2019 13:38	
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 13:38	
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 13:38	
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 13:38	
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 13:38	
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 13:38	
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 13:38	
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 13:38	
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 13:38	
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 13:38	
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 13:38	
Trichloroethene	2.0		0.20	0.50	1.0	UG/L	1	17-Dec-2019 13:38	
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 13:38	
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 13:38	
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>92.1</i>			0	<i>81-118</i>	%REC	1	17-Dec-2019 13:38	
<i>Surr: 4-Bromofluorobenzene</i>	<i>99.0</i>			0	<i>85-114</i>	%REC	1	17-Dec-2019 13:38	
<i>Surr: Dibromofluoromethane</i>	<i>93.1</i>			0	<i>80-119</i>	%REC	1	17-Dec-2019 13:38	
<i>Surr: Toluene-d8</i>	<i>103</i>			0	<i>89-112</i>	%REC	1	17-Dec-2019 13:38	
SEMIVOLATILES SIM		Method:SW8270SIM				Prep:SW3510 / 18-Dec-2019		Analyst: LG	
1,4-Dioxane	1.2		0.050	0.050	0.050	ug/L	5	23-Dec-2019 13:29	
<i>Surr: 2-Fluorobiphenyl</i>	<i>114</i>			0	<i>40-140</i>	%REC	5	23-Dec-2019 13:29	
<i>Surr: 4-Terphenyl-d14</i>	<i>96.3</i>			0	<i>40-140</i>	%REC	5	23-Dec-2019 13:29	
<i>Surr: Nitrobenzene-d5</i>	<i>117</i>			0	<i>40-140</i>	%REC	5	23-Dec-2019 13:29	

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

Revision: 1

ALS Houston, US

Date: 05-Jan-20

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP/Site 18/24
 Sample ID: C08_121219
 Collection Date: 12-Dec-2019 09:00

ANALYTICAL REPORT
 WorkOrder:HS19120765
 Lab ID:HS19120765-03
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A		Method:SW6020				Prep:SW3010A / 24-Dec-2019		Analyst: JHD
Aluminum	0.0286		0.00180	0.00500	0.0100	mg/L	1	27-Dec-2019 14:39
Antimony	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	27-Dec-2019 14:39
Arsenic	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	27-Dec-2019 14:39
Barium	4.53		0.0380	0.0500	0.100	mg/L	20	27-Dec-2019 15:29
Beryllium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	27-Dec-2019 14:39
Cadmium	0.000401	J	0.000200	0.000500	0.00200	mg/L	1	27-Dec-2019 14:39
Calcium	261		0.680	1.00	10.0	mg/L	20	27-Dec-2019 15:29
Chromium	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	27-Dec-2019 14:39
Cobalt	0.00355	J	0.000100	0.000500	0.00500	mg/L	1	27-Dec-2019 14:39
Copper	0.00250	U	0.00100	0.00250	0.00500	mg/L	1	27-Dec-2019 14:39
Iron	0.558		0.0120	0.0500	0.200	mg/L	1	27-Dec-2019 14:39
Lead	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	27-Dec-2019 14:39
Magnesium	168		0.0100	0.0500	0.200	mg/L	1	27-Dec-2019 14:39
Manganese	0.452		0.000700	0.00250	0.00500	mg/L	1	27-Dec-2019 14:39
Nickel	0.00153	J	0.000600	0.00100	0.00500	mg/L	1	27-Dec-2019 14:39
Potassium	1.96		0.0180	0.0500	0.200	mg/L	1	27-Dec-2019 14:39
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	27-Dec-2019 14:39
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	27-Dec-2019 14:39
Sodium	717		0.280	1.00	4.00	mg/L	20	27-Dec-2019 15:29
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	27-Dec-2019 14:39
Vanadium	0.000998	J	0.000600	0.00100	0.00500	mg/L	1	27-Dec-2019 14:39
Zinc	0.00604		0.00200	0.00250	0.00500	mg/L	1	27-Dec-2019 14:39
MERCURY BY SW7470A		Method:SW7470				Prep:SW7470 / 24-Dec-2019		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	24-Dec-2019 17:26
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		Method:NA						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	30-Dec-2019 17:31

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

Revision: 1

ALS Houston, US

Date: 05-Jan-20

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP/Site 18/24
 Sample ID: 18CPTMW24_121219
 Collection Date: 12-Dec-2019 09:50

ANALYTICAL REPORT

WorkOrder:HS19120765
 Lab ID:HS19120765-04
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD		Method:SW8260						
8260C								Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 14:50
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 14:50
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	17-Dec-2019 14:50
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 14:50
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 14:50
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 14:50
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 14:50
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	17-Dec-2019 14:50
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	17-Dec-2019 14:50
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	17-Dec-2019 14:50
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 14:50
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 14:50
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 14:50
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	17-Dec-2019 14:50
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 14:50
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	17-Dec-2019 14:50
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 14:50
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	17-Dec-2019 14:50
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 14:50
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	17-Dec-2019 14:50
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 14:50
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	17-Dec-2019 14:50
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 14:50
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	17-Dec-2019 14:50
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	17-Dec-2019 14:50
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 14:50
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	17-Dec-2019 14:50
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	17-Dec-2019 14:50
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 14:50
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	17-Dec-2019 14:50
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 14:50
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 14:50
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	17-Dec-2019 14:50
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	17-Dec-2019 14:50
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	17-Dec-2019 14:50
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	17-Dec-2019 14:50
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 14:50
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 14:50
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 14:50

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

Revision: 1

ALS Houston, US

Date: 05-Jan-20

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP/Site 18/24
 Sample ID: 18CPTMW24_121219
 Collection Date: 12-Dec-2019 09:50

ANALYTICAL REPORT

WorkOrder:HS19120765
 Lab ID:HS19120765-04
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD		Method:SW8260						
8260C								Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 14:50
cis-1,2-Dichloroethene	26		0.20	0.50	1.0	UG/L	1	17-Dec-2019 14:50
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	17-Dec-2019 14:50
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 14:50
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 14:50
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 14:50
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 14:50
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	UG/L	1	17-Dec-2019 14:50
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 14:50
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	17-Dec-2019 14:50
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	17-Dec-2019 14:50
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	17-Dec-2019 14:50
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 14:50
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 14:50
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 14:50
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 14:50
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 14:50
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 14:50
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 14:50
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 14:50
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 14:50
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 14:50
Trichloroethene	8.8		0.20	0.50	1.0	UG/L	1	17-Dec-2019 14:50
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 14:50
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 14:50
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>91.3</i>			0	<i>81-118</i>	%REC	1	17-Dec-2019 14:50
<i>Surr: 4-Bromofluorobenzene</i>	<i>101</i>			0	<i>85-114</i>	%REC	1	17-Dec-2019 14:50
<i>Surr: Dibromofluoromethane</i>	<i>93.6</i>			0	<i>80-119</i>	%REC	1	17-Dec-2019 14:50
<i>Surr: Toluene-d8</i>	<i>102</i>			0	<i>89-112</i>	%REC	1	17-Dec-2019 14:50
SEMIVOLATILES SIM		Method:SW8270SIM				Prep:SW3510 / 18-Dec-2019		Analyst: LG
1,4-Dioxane	1.3		0.10	0.10	0.10	ug/L	10	23-Dec-2019 13:49
<i>Surr: 2-Fluorobiphenyl</i>	<i>114</i>			0	<i>40-140</i>	%REC	10	23-Dec-2019 13:49
<i>Surr: 4-Terphenyl-d14</i>	<i>109</i>			0	<i>40-140</i>	%REC	10	23-Dec-2019 13:49
<i>Surr: Nitrobenzene-d5</i>	<i>119</i>			0	<i>40-140</i>	%REC	10	23-Dec-2019 13:49

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

Revision: 1

ALS Houston, US

Date: 05-Jan-20

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP/Site 18/24
 Sample ID: 18CPTMW24_121219
 Collection Date: 12-Dec-2019 09:50

ANALYTICAL REPORT

WorkOrder:HS19120765
 Lab ID:HS19120765-04
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A			Method:SW6020			Prep:SW3010A / 24-Dec-2019		Analyst: JHD
Aluminum	0.00631	J	0.00180	0.00500	0.0100	mg/L	1	27-Dec-2019 14:42
Antimony	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	27-Dec-2019 14:42
Arsenic	0.00791		0.000400	0.000500	0.00500	mg/L	1	27-Dec-2019 14:42
Barium	11.7		0.0380	0.0500	0.100	mg/L	20	27-Dec-2019 15:32
Beryllium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	27-Dec-2019 14:42
Cadmium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	27-Dec-2019 14:42
Calcium	427		0.680	1.00	10.0	mg/L	20	27-Dec-2019 15:32
Chromium	0.000465	J	0.000400	0.000500	0.00500	mg/L	1	27-Dec-2019 14:42
Cobalt	0.00358	J	0.000100	0.000500	0.00500	mg/L	1	27-Dec-2019 14:42
Copper	0.00250	U	0.00100	0.00250	0.00500	mg/L	1	27-Dec-2019 14:42
Iron	8.69		0.0120	0.0500	0.200	mg/L	1	27-Dec-2019 14:42
Lead	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	27-Dec-2019 14:42
Magnesium	286		0.200	1.00	4.00	mg/L	20	27-Dec-2019 15:32
Manganese	0.668		0.000700	0.00250	0.00500	mg/L	1	27-Dec-2019 14:42
Nickel	0.00536		0.000600	0.00100	0.00500	mg/L	1	27-Dec-2019 14:42
Potassium	3.19		0.0180	0.0500	0.200	mg/L	1	27-Dec-2019 14:42
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	27-Dec-2019 14:42
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	27-Dec-2019 14:42
Sodium	1,120		0.280	1.00	4.00	mg/L	20	27-Dec-2019 15:32
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	27-Dec-2019 14:42
Vanadium	0.00122	J	0.000600	0.00100	0.00500	mg/L	1	27-Dec-2019 14:42
Zinc	0.00658		0.00200	0.00250	0.00500	mg/L	1	27-Dec-2019 14:42
MERCURY BY SW7470A			Method:SW7470			Prep:SW7470 / 24-Dec-2019		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	24-Dec-2019 17:27
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)			Method:NA			Analyst: SUB		
Subcontract Analysis	See Attached		0	0		NA	1	30-Dec-2019 17:31

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

Revision: 1

ALS Houston, US

Date: 05-Jan-20

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP/Site 18/24
 Sample ID: 18CPTMW07_121219
 Collection Date: 12-Dec-2019 10:45

ANALYTICAL REPORT
 WorkOrder:HS19120765
 Lab ID:HS19120765-05
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED	
VOLATILES ORGANICS BY METHOD		Method:SW8260							Analyst: PC
8260C									
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 14:02	
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 14:02	
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	17-Dec-2019 14:02	
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 14:02	
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 14:02	
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 14:02	
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 14:02	
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	17-Dec-2019 14:02	
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	17-Dec-2019 14:02	
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	17-Dec-2019 14:02	
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 14:02	
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 14:02	
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 14:02	
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	17-Dec-2019 14:02	
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 14:02	
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	17-Dec-2019 14:02	
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 14:02	
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	17-Dec-2019 14:02	
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 14:02	
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	17-Dec-2019 14:02	
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 14:02	
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	17-Dec-2019 14:02	
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 14:02	
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	17-Dec-2019 14:02	
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	17-Dec-2019 14:02	
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 14:02	
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	17-Dec-2019 14:02	
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	17-Dec-2019 14:02	
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 14:02	
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	17-Dec-2019 14:02	
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 14:02	
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 14:02	
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	17-Dec-2019 14:02	
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	17-Dec-2019 14:02	
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	17-Dec-2019 14:02	
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	17-Dec-2019 14:02	
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 14:02	
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 14:02	
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 14:02	

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

Revision: 1

ALS Houston, US

Date: 05-Jan-20

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP/Site 18/24
 Sample ID: 18CPTMW07_121219
 Collection Date: 12-Dec-2019 10:45

ANALYTICAL REPORT

WorkOrder:HS19120765
 Lab ID:HS19120765-05
 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	17-Dec-2019 14:02	
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 14:02	
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	17-Dec-2019 14:02	
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 14:02	
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 14:02	
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 14:02	
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 14:02	
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	UG/L	1	17-Dec-2019 14:02	
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 14:02	
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	17-Dec-2019 14:02	
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	17-Dec-2019 14:02	
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	17-Dec-2019 14:02	
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 14:02	
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 14:02	
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 14:02	
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 14:02	
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 14:02	
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 14:02	
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 14:02	
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 14:02	
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 14:02	
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 14:02	
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 14:02	
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 14:02	
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 14:02	
Surr: 1,2-Dichloroethane-d4	90.7			0	81-118	%REC	1	17-Dec-2019 14:02	
Surr: 4-Bromofluorobenzene	98.6			0	85-114	%REC	1	17-Dec-2019 14:02	
Surr: Dibromofluoromethane	92.3			0	80-119	%REC	1	17-Dec-2019 14:02	
Surr: Toluene-d8	103			0	89-112	%REC	1	17-Dec-2019 14:02	
SEMIVOLATILES SIM		Method:SW8270SIM				Prep:SW3510 / 18-Dec-2019		Analyst: LG	
1,4-Dioxane	1.3		0.050	0.050	0.050	ug/L	5	23-Dec-2019 14:08	
Surr: 2-Fluorobiphenyl	129			0	40-140	%REC	5	23-Dec-2019 14:08	
Surr: 4-Terphenyl-d14	106			0	40-140	%REC	5	23-Dec-2019 14:08	
Surr: Nitrobenzene-d5	126			0	40-140	%REC	5	23-Dec-2019 14:08	
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		Method:NA						Analyst: SUB	
Subcontract Analysis	See Attached		0	0		NA	1	30-Dec-2019 17:31	

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

Revision: 1

ALS Houston, US

Date: 05-Jan-20

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP/Site 18/24
 Sample ID: 109_121219
 Collection Date: 12-Dec-2019 11:35

ANALYTICAL REPORT
 WorkOrder:HS19120765
 Lab ID:HS19120765-06
 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	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 15:14	
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 15:14	
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	17-Dec-2019 15:14	
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 15:14	
1,1-Dichloroethane	0.89	J	0.20	0.50	1.0	UG/L	1	17-Dec-2019 15:14	
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 15:14	
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 15:14	
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	17-Dec-2019 15:14	
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	17-Dec-2019 15:14	
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	17-Dec-2019 15:14	
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 15:14	
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 15:14	
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 15:14	
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	17-Dec-2019 15:14	
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 15:14	
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	17-Dec-2019 15:14	
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 15:14	
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	17-Dec-2019 15:14	
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 15:14	
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	17-Dec-2019 15:14	
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 15:14	
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	17-Dec-2019 15:14	
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 15:14	
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	17-Dec-2019 15:14	
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	17-Dec-2019 15:14	
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 15:14	
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	17-Dec-2019 15:14	
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	17-Dec-2019 15:14	
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 15:14	
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	17-Dec-2019 15:14	
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 15:14	
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 15:14	
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	17-Dec-2019 15:14	
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	17-Dec-2019 15:14	
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	17-Dec-2019 15:14	
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	17-Dec-2019 15:14	
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 15:14	
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 15:14	
Chloroform	1.3		0.20	0.50	1.0	UG/L	1	17-Dec-2019 15:14	

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

Revision: 1

ALS Houston, US

Date: 05-Jan-20

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP/Site 18/24
 Sample ID: 109_121219
 Collection Date: 12-Dec-2019 11:35

ANALYTICAL REPORT

WorkOrder:HS19120765
 Lab ID:HS19120765-06
 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	17-Dec-2019 15:14	
cis-1,2-Dichloroethene	120		0.20	0.50	1.0	UG/L	1	17-Dec-2019 15:14	
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	17-Dec-2019 15:14	
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 15:14	
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 15:14	
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 15:14	
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 15:14	
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	UG/L	1	17-Dec-2019 15:14	
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 15:14	
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	17-Dec-2019 15:14	
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	17-Dec-2019 15:14	
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	17-Dec-2019 15:14	
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 15:14	
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 15:14	
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 15:14	
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 15:14	
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 15:14	
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 15:14	
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 15:14	
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 15:14	
trans-1,2-Dichloroethene	1.4		0.20	0.50	1.0	UG/L	1	17-Dec-2019 15:14	
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 15:14	
Trichloroethene	400		1.0	2.5	5.0	UG/L	5	17-Dec-2019 18:27	
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 15:14	
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 15:14	
Surr: 1,2-Dichloroethane-d4	91.3			0	81-118	%REC	1	17-Dec-2019 15:14	
Surr: 1,2-Dichloroethane-d4	90.1			0	81-118	%REC	5	17-Dec-2019 18:27	
Surr: 4-Bromofluorobenzene	98.5			0	85-114	%REC	1	17-Dec-2019 15:14	
Surr: 4-Bromofluorobenzene	99.6			0	85-114	%REC	5	17-Dec-2019 18:27	
Surr: Dibromofluoromethane	93.6			0	80-119	%REC	1	17-Dec-2019 15:14	
Surr: Dibromofluoromethane	92.8			0	80-119	%REC	5	17-Dec-2019 18:27	
Surr: Toluene-d8	102			0	89-112	%REC	1	17-Dec-2019 15:14	
Surr: Toluene-d8	103			0	89-112	%REC	5	17-Dec-2019 18:27	
SEMIVOLATILES SIM		Method:SW8270SIM				Prep:SW3510 / 18-Dec-2019		Analyst: LG	
1,4-Dioxane	0.70		0.10	0.10	0.10	ug/L	10	23-Dec-2019 14:27	
Surr: 2-Fluorobiphenyl	114			0	40-140	%REC	10	23-Dec-2019 14:27	
Surr: 4-Terphenyl-d14	99.7			0	40-140	%REC	10	23-Dec-2019 14:27	
Surr: Nitrobenzene-d5	107			0	40-140	%REC	10	23-Dec-2019 14:27	

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

Revision: 1

ALS Houston, US

Date: 05-Jan-20

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP/Site 18/24
 Sample ID: 109_121219
 Collection Date: 12-Dec-2019 11:35

ANALYTICAL REPORT

WorkOrder:HS19120765
 Lab ID:HS19120765-06
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		Method:NA		Analyst: SUB				
Subcontract Analysis	See Attached		0	0		NA	1	30-Dec-2019 17:31

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

Revision: 1

ALS Houston, US

Date: 05-Jan-20

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP/Site 18/24
 Sample ID: MW3_121219
 Collection Date: 12-Dec-2019 12:30

ANALYTICAL REPORT
 WorkOrder:HS19120765
 Lab ID:HS19120765-07
 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	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 15:38	
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 15:38	
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	17-Dec-2019 15:38	
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 15:38	
1,1-Dichloroethane	4.3		0.20	0.50	1.0	UG/L	1	17-Dec-2019 15:38	
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 15:38	
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 15:38	
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	17-Dec-2019 15:38	
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	17-Dec-2019 15:38	
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	17-Dec-2019 15:38	
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 15:38	
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 15:38	
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 15:38	
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	17-Dec-2019 15:38	
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 15:38	
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	17-Dec-2019 15:38	
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 15:38	
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	17-Dec-2019 15:38	
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 15:38	
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	17-Dec-2019 15:38	
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 15:38	
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	17-Dec-2019 15:38	
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 15:38	
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	17-Dec-2019 15:38	
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	17-Dec-2019 15:38	
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 15:38	
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	17-Dec-2019 15:38	
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	17-Dec-2019 15:38	
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 15:38	
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	17-Dec-2019 15:38	
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 15:38	
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 15:38	
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	17-Dec-2019 15:38	
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	17-Dec-2019 15:38	
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	17-Dec-2019 15:38	
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	17-Dec-2019 15:38	
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 15:38	
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 15:38	
Chloroform	1.3		0.20	0.50	1.0	UG/L	1	17-Dec-2019 15:38	

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

Revision: 1

ALS Houston, US

Date: 05-Jan-20

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP/Site 18/24
 Sample ID: MW3_121219
 Collection Date: 12-Dec-2019 12:30

ANALYTICAL REPORT
 WorkOrder:HS19120765
 Lab ID:HS19120765-07
 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	17-Dec-2019 15:38	
cis-1,2-Dichloroethene	65		0.20	0.50	1.0	UG/L	1	17-Dec-2019 15:38	
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	17-Dec-2019 15:38	
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 15:38	
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 15:38	
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 15:38	
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 15:38	
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	UG/L	1	17-Dec-2019 15:38	
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 15:38	
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	17-Dec-2019 15:38	
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	17-Dec-2019 15:38	
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	17-Dec-2019 15:38	
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 15:38	
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 15:38	
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 15:38	
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 15:38	
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 15:38	
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 15:38	
Tetrachloroethene	1.2		0.30	0.50	1.0	UG/L	1	17-Dec-2019 15:38	
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 15:38	
trans-1,2-Dichloroethene	3.2		0.20	0.50	1.0	UG/L	1	17-Dec-2019 15:38	
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 15:38	
Trichloroethene	360		1.0	2.5	5.0	UG/L	5	17-Dec-2019 18:51	
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 15:38	
Vinyl chloride	25		0.20	0.50	1.0	UG/L	1	17-Dec-2019 15:38	
Surr: 1,2-Dichloroethane-d4	90.5			0	81-118	%REC	5	17-Dec-2019 18:51	
Surr: 1,2-Dichloroethane-d4	90.8			0	81-118	%REC	1	17-Dec-2019 15:38	
Surr: 4-Bromofluorobenzene	99.4			0	85-114	%REC	5	17-Dec-2019 18:51	
Surr: 4-Bromofluorobenzene	99.1			0	85-114	%REC	1	17-Dec-2019 15:38	
Surr: Dibromofluoromethane	93.0			0	80-119	%REC	1	17-Dec-2019 15:38	
Surr: Dibromofluoromethane	93.0			0	80-119	%REC	5	17-Dec-2019 18:51	
Surr: Toluene-d8	102			0	89-112	%REC	5	17-Dec-2019 18:51	
Surr: Toluene-d8	101			0	89-112	%REC	1	17-Dec-2019 15:38	

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

Revision: 1

ALS Houston, US

Date: 05-Jan-20

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP/Site 18/24
 Sample ID: MW3_121219
 Collection Date: 12-Dec-2019 12:30

ANALYTICAL REPORT

WorkOrder:HS19120765
 Lab ID:HS19120765-07
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A			Method:SW6020			Prep:SW3010A / 24-Dec-2019		Analyst: JHD
Aluminum	0.00215	J	0.00180	0.00500	0.0100	mg/L	1	27-Dec-2019 14:44
Antimony	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	27-Dec-2019 14:44
Arsenic	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	27-Dec-2019 14:44
Barium	0.614		0.00190	0.00250	0.00500	mg/L	1	27-Dec-2019 14:44
Beryllium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	27-Dec-2019 14:44
Cadmium	0.000342	J	0.000200	0.000500	0.00200	mg/L	1	27-Dec-2019 14:44
Calcium	33.1		0.0340	0.0500	0.500	mg/L	1	27-Dec-2019 14:44
Chromium	0.000982	J	0.000400	0.000500	0.00500	mg/L	1	27-Dec-2019 14:44
Cobalt	0.00483	J	0.000100	0.000500	0.00500	mg/L	1	27-Dec-2019 14:44
Copper	0.00250	U	0.00100	0.00250	0.00500	mg/L	1	27-Dec-2019 14:44
Iron	0.343		0.0120	0.0500	0.200	mg/L	1	27-Dec-2019 14:44
Lead	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	27-Dec-2019 14:44
Magnesium	20.6		0.0100	0.0500	0.200	mg/L	1	27-Dec-2019 14:44
Manganese	2.47		0.0140	0.0500	0.100	mg/L	20	27-Dec-2019 15:51
Nickel	0.00606		0.000600	0.00100	0.00500	mg/L	1	27-Dec-2019 14:44
Potassium	1.76		0.0180	0.0500	0.200	mg/L	1	27-Dec-2019 14:44
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	27-Dec-2019 14:44
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	27-Dec-2019 14:44
Sodium	292		0.280	1.00	4.00	mg/L	20	27-Dec-2019 15:51
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	27-Dec-2019 14:44
Vanadium	0.000932	J	0.000600	0.00100	0.00500	mg/L	1	27-Dec-2019 14:44
Zinc	0.00550		0.00200	0.00250	0.00500	mg/L	1	27-Dec-2019 14:44
MERCURY BY SW7470A			Method:SW7470			Prep:SW7470 / 24-Dec-2019		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	24-Dec-2019 17:29
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)			Method:NA			Analyst: SUB		
Subcontract Analysis	See Attached		0	0		NA	1	30-Dec-2019 17:31

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

Revision: 1

ALS Houston, US

Date: 05-Jan-20

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP/Site 18/24
 Sample ID: MW23_121219
 Collection Date: 12-Dec-2019 13:20

ANALYTICAL REPORT
 WorkOrder:HS19120765
 Lab ID:HS19120765-08
 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	5.0	U	3.0	5.0	10	UG/L	10	17-Dec-2019 16:02	
1,1,1-Trichloroethane	5.0	U	2.0	5.0	10	UG/L	10	17-Dec-2019 16:02	
1,1,2,2-Tetrachloroethane	5.0	U	5.0	5.0	10	UG/L	10	17-Dec-2019 16:02	
1,1,2-Trichloroethane	5.0	U	3.0	5.0	10	UG/L	10	17-Dec-2019 16:02	
1,1-Dichloroethane	5.0	U	2.0	5.0	10	UG/L	10	17-Dec-2019 16:02	
1,1-Dichloroethene	5.0	U	2.0	5.0	10	UG/L	10	17-Dec-2019 16:02	
1,1-Dichloropropene	5.0	U	3.0	5.0	10	UG/L	10	17-Dec-2019 16:02	
1,2,3-Trichlorobenzene	5.0	U	4.0	5.0	10	UG/L	10	17-Dec-2019 16:02	
1,2,3-Trichloropropane	5.0	U	5.0	5.0	10	UG/L	10	17-Dec-2019 16:02	
1,2,4-Trichlorobenzene	5.0	U	5.0	5.0	10	UG/L	10	17-Dec-2019 16:02	
1,2,4-Trimethylbenzene	5.0	U	3.0	5.0	10	UG/L	10	17-Dec-2019 16:02	
1,2-Dibromo-3-chloropropane	5.0	U	2.0	5.0	10	UG/L	10	17-Dec-2019 16:02	
1,2-Dibromoethane	5.0	U	2.0	5.0	10	UG/L	10	17-Dec-2019 16:02	
1,2-Dichlorobenzene	5.0	U	5.0	5.0	10	UG/L	10	17-Dec-2019 16:02	
1,2-Dichloroethane	69		2.0	5.0	10	UG/L	10	17-Dec-2019 16:02	
1,2-Dichloropropane	5.0	U	5.0	5.0	10	UG/L	10	17-Dec-2019 16:02	
1,3,5-Trimethylbenzene	5.0	U	3.0	5.0	10	UG/L	10	17-Dec-2019 16:02	
1,3-Dichlorobenzene	5.0	U	4.0	5.0	10	UG/L	10	17-Dec-2019 16:02	
1,3-Dichloropropane	5.0	U	3.0	5.0	10	UG/L	10	17-Dec-2019 16:02	
1,4-Dichlorobenzene	5.0	U	4.0	5.0	10	UG/L	10	17-Dec-2019 16:02	
2,2-Dichloropropane	5.0	U	2.0	5.0	10	UG/L	10	17-Dec-2019 16:02	
2-Butanone	10	U	5.0	10	20	UG/L	10	17-Dec-2019 16:02	
2-Chlorotoluene	5.0	U	3.0	5.0	10	UG/L	10	17-Dec-2019 16:02	
2-Hexanone	10	U	10	10	20	UG/L	10	17-Dec-2019 16:02	
4-Chlorotoluene	5.0	U	4.0	5.0	10	UG/L	10	17-Dec-2019 16:02	
4-Isopropyltoluene	5.0	U	3.0	5.0	10	UG/L	10	17-Dec-2019 16:02	
4-Methyl-2-pentanone	10	U	7.0	10	20	UG/L	10	17-Dec-2019 16:02	
Acetone	10	U	4.0	10	20	UG/L	10	17-Dec-2019 16:02	
Benzene	5.0	U	2.0	5.0	10	UG/L	10	17-Dec-2019 16:02	
Bromobenzene	5.0	U	4.0	5.0	10	UG/L	10	17-Dec-2019 16:02	
Bromochloromethane	5.0	U	2.0	5.0	10	UG/L	10	17-Dec-2019 16:02	
Bromodichloromethane	5.0	U	2.0	5.0	10	UG/L	10	17-Dec-2019 16:02	
Bromoform	5.0	U	4.0	5.0	10	UG/L	10	17-Dec-2019 16:02	
Bromomethane	5.0	U	4.0	5.0	10	UG/L	10	17-Dec-2019 16:02	
Carbon disulfide	10	U	6.0	10	20	UG/L	10	17-Dec-2019 16:02	
Carbon tetrachloride	5.0	U	5.0	5.0	10	UG/L	10	17-Dec-2019 16:02	
Chlorobenzene	5.0	U	3.0	5.0	10	UG/L	10	17-Dec-2019 16:02	
Chloroethane	5.0	U	3.0	5.0	10	UG/L	10	17-Dec-2019 16:02	
Chloroform	9.1	J	2.0	5.0	10	UG/L	10	17-Dec-2019 16:02	

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

Revision: 1

ALS Houston, US

Date: 05-Jan-20

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP/Site 18/24
 Sample ID: MW23_121219
 Collection Date: 12-Dec-2019 13:20

ANALYTICAL REPORT
 WorkOrder:HS19120765
 Lab ID:HS19120765-08
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED	
VOLATILES ORGANICS BY METHOD 8260C		Method:SW8260						Analyst: PC	
Chloromethane	5.0	U	2.0	5.0	10	UG/L	10	17-Dec-2019 16:02	
cis-1,2-Dichloroethene	19		2.0	5.0	10	UG/L	10	17-Dec-2019 16:02	
cis-1,3-Dichloropropene	5.0	U	1.0	5.0	10	UG/L	10	17-Dec-2019 16:02	
Dibromochloromethane	5.0	U	3.0	5.0	10	UG/L	10	17-Dec-2019 16:02	
Dibromomethane	5.0	U	2.0	5.0	10	UG/L	10	17-Dec-2019 16:02	
Dichlorodifluoromethane	5.0	U	3.0	5.0	10	UG/L	10	17-Dec-2019 16:02	
Ethylbenzene	5.0	U	3.0	5.0	10	UG/L	10	17-Dec-2019 16:02	
Hexachlorobutadiene	5.0	U	10	5.0	10	UG/L	10	17-Dec-2019 16:02	
Isopropylbenzene	5.0	U	3.0	5.0	10	UG/L	10	17-Dec-2019 16:02	
m,p-Xylene	10	U	5.0	10	20	UG/L	10	17-Dec-2019 16:02	
Methylene chloride	10	U	4.0	10	20	UG/L	10	17-Dec-2019 16:02	
n-Butylbenzene	5.0	U	4.0	5.0	10	UG/L	10	17-Dec-2019 16:02	
n-Propylbenzene	5.0	U	3.0	5.0	10	UG/L	10	17-Dec-2019 16:02	
Naphthalene	5.0	U	3.0	5.0	10	UG/L	10	17-Dec-2019 16:02	
o-Xylene	5.0	U	3.0	5.0	10	UG/L	10	17-Dec-2019 16:02	
sec-Butylbenzene	5.0	U	3.0	5.0	10	UG/L	10	17-Dec-2019 16:02	
Styrene	5.0	U	3.0	5.0	10	UG/L	10	17-Dec-2019 16:02	
tert-Butylbenzene	5.0	U	3.0	5.0	10	UG/L	10	17-Dec-2019 16:02	
Tetrachloroethene	5.0	U	3.0	5.0	10	UG/L	10	17-Dec-2019 16:02	
Toluene	5.0	U	2.0	5.0	10	UG/L	10	17-Dec-2019 16:02	
trans-1,2-Dichloroethene	5.0	U	2.0	5.0	10	UG/L	10	17-Dec-2019 16:02	
trans-1,3-Dichloropropene	5.0	U	2.0	5.0	10	UG/L	10	17-Dec-2019 16:02	
Trichloroethene	3,000		20	50	100	UG/L	100	17-Dec-2019 17:39	
Trichlorofluoromethane	5.0	U	3.0	5.0	10	UG/L	10	17-Dec-2019 16:02	
Vinyl chloride	5.0	U	2.0	5.0	10	UG/L	10	17-Dec-2019 16:02	
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>91.1</i>			0	<i>81-118</i>	%REC	10	17-Dec-2019 16:02	
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>90.6</i>			0	<i>81-118</i>	%REC	100	17-Dec-2019 17:39	
<i>Surr: 4-Bromofluorobenzene</i>	<i>98.0</i>			0	<i>85-114</i>	%REC	10	17-Dec-2019 16:02	
<i>Surr: 4-Bromofluorobenzene</i>	<i>97.6</i>			0	<i>85-114</i>	%REC	100	17-Dec-2019 17:39	
<i>Surr: Dibromofluoromethane</i>	<i>93.2</i>			0	<i>80-119</i>	%REC	10	17-Dec-2019 16:02	
<i>Surr: Dibromofluoromethane</i>	<i>92.5</i>			0	<i>80-119</i>	%REC	100	17-Dec-2019 17:39	
<i>Surr: Toluene-d8</i>	<i>102</i>			0	<i>89-112</i>	%REC	10	17-Dec-2019 16:02	
<i>Surr: Toluene-d8</i>	<i>102</i>			0	<i>89-112</i>	%REC	100	17-Dec-2019 17:39	
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		Method:NA						Analyst: SUB	
Subcontract Analysis	See Attached		0	0		NA	1	30-Dec-2019 17:31	

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

Revision: 1

ALS Houston, US

Date: 05-Jan-20

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP/Site 18/24
 Sample ID: MW23_121219_a
 Collection Date: 12-Dec-2019 13:20

ANALYTICAL REPORT
 WorkOrder:HS19120765
 Lab ID:HS19120765-09
 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	5.0	U	3.0	5.0	10	UG/L	10	17-Dec-2019 16:26	
1,1,1-Trichloroethane	5.0	U	2.0	5.0	10	UG/L	10	17-Dec-2019 16:26	
1,1,2,2-Tetrachloroethane	5.0	U	5.0	5.0	10	UG/L	10	17-Dec-2019 16:26	
1,1,2-Trichloroethane	5.0	U	3.0	5.0	10	UG/L	10	17-Dec-2019 16:26	
1,1-Dichloroethane	5.0	U	2.0	5.0	10	UG/L	10	17-Dec-2019 16:26	
1,1-Dichloroethene	5.0	U	2.0	5.0	10	UG/L	10	17-Dec-2019 16:26	
1,1-Dichloropropene	5.0	U	3.0	5.0	10	UG/L	10	17-Dec-2019 16:26	
1,2,3-Trichlorobenzene	5.0	U	4.0	5.0	10	UG/L	10	17-Dec-2019 16:26	
1,2,3-Trichloropropane	5.0	U	5.0	5.0	10	UG/L	10	17-Dec-2019 16:26	
1,2,4-Trichlorobenzene	5.0	U	5.0	5.0	10	UG/L	10	17-Dec-2019 16:26	
1,2,4-Trimethylbenzene	5.0	U	3.0	5.0	10	UG/L	10	17-Dec-2019 16:26	
1,2-Dibromo-3-chloropropane	5.0	U	2.0	5.0	10	UG/L	10	17-Dec-2019 16:26	
1,2-Dibromoethane	5.0	U	2.0	5.0	10	UG/L	10	17-Dec-2019 16:26	
1,2-Dichlorobenzene	5.0	U	5.0	5.0	10	UG/L	10	17-Dec-2019 16:26	
1,2-Dichloroethane	68		2.0	5.0	10	UG/L	10	17-Dec-2019 16:26	
1,2-Dichloropropane	5.0	U	5.0	5.0	10	UG/L	10	17-Dec-2019 16:26	
1,3,5-Trimethylbenzene	5.0	U	3.0	5.0	10	UG/L	10	17-Dec-2019 16:26	
1,3-Dichlorobenzene	5.0	U	4.0	5.0	10	UG/L	10	17-Dec-2019 16:26	
1,3-Dichloropropane	5.0	U	3.0	5.0	10	UG/L	10	17-Dec-2019 16:26	
1,4-Dichlorobenzene	5.0	U	4.0	5.0	10	UG/L	10	17-Dec-2019 16:26	
2,2-Dichloropropane	5.0	U	2.0	5.0	10	UG/L	10	17-Dec-2019 16:26	
2-Butanone	10	U	5.0	10	20	UG/L	10	17-Dec-2019 16:26	
2-Chlorotoluene	5.0	U	3.0	5.0	10	UG/L	10	17-Dec-2019 16:26	
2-Hexanone	10	U	10	10	20	UG/L	10	17-Dec-2019 16:26	
4-Chlorotoluene	5.0	U	4.0	5.0	10	UG/L	10	17-Dec-2019 16:26	
4-Isopropyltoluene	5.0	U	3.0	5.0	10	UG/L	10	17-Dec-2019 16:26	
4-Methyl-2-pentanone	10	U	7.0	10	20	UG/L	10	17-Dec-2019 16:26	
Acetone	10	U	4.0	10	20	UG/L	10	17-Dec-2019 16:26	
Benzene	5.0	U	2.0	5.0	10	UG/L	10	17-Dec-2019 16:26	
Bromobenzene	5.0	U	4.0	5.0	10	UG/L	10	17-Dec-2019 16:26	
Bromochloromethane	5.0	U	2.0	5.0	10	UG/L	10	17-Dec-2019 16:26	
Bromodichloromethane	5.0	U	2.0	5.0	10	UG/L	10	17-Dec-2019 16:26	
Bromoform	5.0	U	4.0	5.0	10	UG/L	10	17-Dec-2019 16:26	
Bromomethane	5.0	U	4.0	5.0	10	UG/L	10	17-Dec-2019 16:26	
Carbon disulfide	10	U	6.0	10	20	UG/L	10	17-Dec-2019 16:26	
Carbon tetrachloride	5.0	U	5.0	5.0	10	UG/L	10	17-Dec-2019 16:26	
Chlorobenzene	5.0	U	3.0	5.0	10	UG/L	10	17-Dec-2019 16:26	
Chloroethane	5.0	U	3.0	5.0	10	UG/L	10	17-Dec-2019 16:26	
Chloroform	8.7	J	2.0	5.0	10	UG/L	10	17-Dec-2019 16:26	

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

Revision: 1

ALS Houston, US

Date: 05-Jan-20

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP/Site 18/24
 Sample ID: MW23_121219_a
 Collection Date: 12-Dec-2019 13:20

ANALYTICAL REPORT

WorkOrder:HS19120765
 Lab ID:HS19120765-09
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED	
VOLATILES ORGANICS BY METHOD 8260C		Method:SW8260						Analyst: PC	
Chloromethane	5.0	U	2.0	5.0	10	UG/L	10	17-Dec-2019 16:26	
cis-1,2-Dichloroethene	18		2.0	5.0	10	UG/L	10	17-Dec-2019 16:26	
cis-1,3-Dichloropropene	5.0	U	1.0	5.0	10	UG/L	10	17-Dec-2019 16:26	
Dibromochloromethane	5.0	U	3.0	5.0	10	UG/L	10	17-Dec-2019 16:26	
Dibromomethane	5.0	U	2.0	5.0	10	UG/L	10	17-Dec-2019 16:26	
Dichlorodifluoromethane	5.0	U	3.0	5.0	10	UG/L	10	17-Dec-2019 16:26	
Ethylbenzene	5.0	U	3.0	5.0	10	UG/L	10	17-Dec-2019 16:26	
Hexachlorobutadiene	5.0	U	10	5.0	10	UG/L	10	17-Dec-2019 16:26	
Isopropylbenzene	5.0	U	3.0	5.0	10	UG/L	10	17-Dec-2019 16:26	
m,p-Xylene	10	U	5.0	10	20	UG/L	10	17-Dec-2019 16:26	
Methylene chloride	10	U	4.0	10	20	UG/L	10	17-Dec-2019 16:26	
n-Butylbenzene	5.0	U	4.0	5.0	10	UG/L	10	17-Dec-2019 16:26	
n-Propylbenzene	5.0	U	3.0	5.0	10	UG/L	10	17-Dec-2019 16:26	
Naphthalene	5.0	U	3.0	5.0	10	UG/L	10	17-Dec-2019 16:26	
o-Xylene	5.0	U	3.0	5.0	10	UG/L	10	17-Dec-2019 16:26	
sec-Butylbenzene	5.0	U	3.0	5.0	10	UG/L	10	17-Dec-2019 16:26	
Styrene	5.0	U	3.0	5.0	10	UG/L	10	17-Dec-2019 16:26	
tert-Butylbenzene	5.0	U	3.0	5.0	10	UG/L	10	17-Dec-2019 16:26	
Tetrachloroethene	5.0	U	3.0	5.0	10	UG/L	10	17-Dec-2019 16:26	
Toluene	5.0	U	2.0	5.0	10	UG/L	10	17-Dec-2019 16:26	
trans-1,2-Dichloroethene	5.0	U	2.0	5.0	10	UG/L	10	17-Dec-2019 16:26	
trans-1,3-Dichloropropene	5.0	U	2.0	5.0	10	UG/L	10	17-Dec-2019 16:26	
Trichloroethene	3,000		20	50	100	UG/L	100	17-Dec-2019 18:03	
Trichlorofluoromethane	5.0	U	3.0	5.0	10	UG/L	10	17-Dec-2019 16:26	
Vinyl chloride	5.0	U	2.0	5.0	10	UG/L	10	17-Dec-2019 16:26	
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>91.5</i>			0	<i>81-118</i>	%REC	10	17-Dec-2019 16:26	
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>91.0</i>			0	<i>81-118</i>	%REC	100	17-Dec-2019 18:03	
<i>Surr: 4-Bromofluorobenzene</i>	<i>101</i>			0	<i>85-114</i>	%REC	10	17-Dec-2019 16:26	
<i>Surr: 4-Bromofluorobenzene</i>	<i>99.8</i>			0	<i>85-114</i>	%REC	100	17-Dec-2019 18:03	
<i>Surr: Dibromofluoromethane</i>	<i>93.4</i>			0	<i>80-119</i>	%REC	10	17-Dec-2019 16:26	
<i>Surr: Dibromofluoromethane</i>	<i>92.3</i>			0	<i>80-119</i>	%REC	100	17-Dec-2019 18:03	
<i>Surr: Toluene-d8</i>	<i>101</i>			0	<i>89-112</i>	%REC	10	17-Dec-2019 16:26	
<i>Surr: Toluene-d8</i>	<i>102</i>			0	<i>89-112</i>	%REC	100	17-Dec-2019 18:03	
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		Method:NA						Analyst: SUB	
Subcontract Analysis	See Attached		0	0		NA	1	30-Dec-2019 17:31	

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

Revision: 1

ALS Houston, US

Date: 05-Jan-20

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP/Site 18/24
 Sample ID: 125_121219
 Collection Date: 12-Dec-2019 13:40

ANALYTICAL REPORT

WorkOrder:HS19120765
 Lab ID:HS19120765-10
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD		Method:SW8260						
8260C								Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 14:26
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 14:26
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	17-Dec-2019 14:26
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 14:26
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 14:26
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 14:26
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 14:26
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	17-Dec-2019 14:26
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	17-Dec-2019 14:26
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	17-Dec-2019 14:26
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 14:26
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 14:26
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 14:26
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	17-Dec-2019 14:26
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 14:26
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	17-Dec-2019 14:26
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 14:26
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	17-Dec-2019 14:26
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 14:26
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	17-Dec-2019 14:26
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 14:26
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	17-Dec-2019 14:26
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 14:26
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	17-Dec-2019 14:26
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	17-Dec-2019 14:26
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 14:26
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	17-Dec-2019 14:26
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	17-Dec-2019 14:26
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 14:26
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	17-Dec-2019 14:26
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 14:26
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 14:26
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	17-Dec-2019 14:26
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	17-Dec-2019 14:26
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	17-Dec-2019 14:26
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	17-Dec-2019 14:26
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 14:26
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 14:26
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 14:26

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

Revision: 1

ALS Houston, US

Date: 05-Jan-20

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP/Site 18/24
 Sample ID: 125_121219
 Collection Date: 12-Dec-2019 13:40

ANALYTICAL REPORT
 WorkOrder:HS19120765
 Lab ID:HS19120765-10
 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	17-Dec-2019 14:26	
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 14:26	
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	17-Dec-2019 14:26	
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 14:26	
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 14:26	
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 14:26	
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 14:26	
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	UG/L	1	17-Dec-2019 14:26	
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 14:26	
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	17-Dec-2019 14:26	
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	17-Dec-2019 14:26	
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	17-Dec-2019 14:26	
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 14:26	
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 14:26	
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 14:26	
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 14:26	
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 14:26	
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 14:26	
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 14:26	
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 14:26	
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 14:26	
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 14:26	
Trichloroethene	0.89	J	0.20	0.50	1.0	UG/L	1	17-Dec-2019 14:26	
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 14:26	
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 14:26	
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>90.8</i>			0	<i>81-118</i>	%REC	1	<i>17-Dec-2019 14:26</i>	
<i>Surr: 4-Bromofluorobenzene</i>	<i>98.1</i>			0	<i>85-114</i>	%REC	1	<i>17-Dec-2019 14:26</i>	
<i>Surr: Dibromofluoromethane</i>	<i>92.0</i>			0	<i>80-119</i>	%REC	1	<i>17-Dec-2019 14:26</i>	
<i>Surr: Toluene-d8</i>	<i>102</i>			0	<i>89-112</i>	%REC	1	<i>17-Dec-2019 14:26</i>	

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

Revision: 1

ALS Houston, US

Date: 05-Jan-20

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP/Site 18/24
 Sample ID: 125_121219
 Collection Date: 12-Dec-2019 13:40

ANALYTICAL REPORT
 WorkOrder:HS19120765
 Lab ID:HS19120765-10
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A		Method:SW6020				Prep:SW3010A / 24-Dec-2019		Analyst: JHD
Aluminum	0.430		0.00180	0.00500	0.0100	mg/L	1	27-Dec-2019 14:46
Antimony	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	27-Dec-2019 14:46
Arsenic	0.000643	J	0.000400	0.000500	0.00500	mg/L	1	27-Dec-2019 14:46
Barium	0.107		0.00190	0.00250	0.00500	mg/L	1	27-Dec-2019 14:46
Beryllium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	27-Dec-2019 14:46
Cadmium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	27-Dec-2019 14:46
Calcium	2.06		0.0340	0.0500	0.500	mg/L	1	27-Dec-2019 14:46
Chromium	0.00167	J	0.000400	0.000500	0.00500	mg/L	1	27-Dec-2019 14:46
Cobalt	0.000632	J	0.000100	0.000500	0.00500	mg/L	1	27-Dec-2019 14:46
Copper	0.00250	U	0.00100	0.00250	0.00500	mg/L	1	27-Dec-2019 14:46
Iron	0.617		0.0120	0.0500	0.200	mg/L	1	27-Dec-2019 14:46
Lead	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	27-Dec-2019 14:46
Magnesium	1.56		0.0100	0.0500	0.200	mg/L	1	27-Dec-2019 14:46
Manganese	0.0135		0.000700	0.00250	0.00500	mg/L	1	27-Dec-2019 14:46
Nickel	0.00252	J	0.000600	0.00100	0.00500	mg/L	1	27-Dec-2019 14:46
Potassium	0.676		0.0180	0.0500	0.200	mg/L	1	27-Dec-2019 14:46
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	27-Dec-2019 14:46
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	27-Dec-2019 14:46
Sodium	43.8		0.0140	0.0500	0.200	mg/L	1	27-Dec-2019 14:46
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	27-Dec-2019 14:46
Vanadium	0.00209	J	0.000600	0.00100	0.00500	mg/L	1	27-Dec-2019 14:46
Zinc	0.00554		0.00200	0.00250	0.00500	mg/L	1	27-Dec-2019 14:46
MERCURY BY SW7470A		Method:SW7470				Prep:SW7470 / 24-Dec-2019		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	24-Dec-2019 17:31
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		Method:NA						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	30-Dec-2019 17:31

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

Revision: 1

ALS Houston, US

Date: 05-Jan-20

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP/Site 18/24
 Sample ID: Trip Blank
 Collection Date: 12-Dec-2019 00:00

ANALYTICAL REPORT
 WorkOrder:HS19120765
 Lab ID:HS19120765-11
 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD		Method:SW8260						
8260C								Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 12:26
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 12:26
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	17-Dec-2019 12:26
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 12:26
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 12:26
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 12:26
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 12:26
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	17-Dec-2019 12:26
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	17-Dec-2019 12:26
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	17-Dec-2019 12:26
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 12:26
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 12:26
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 12:26
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	17-Dec-2019 12:26
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 12:26
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	17-Dec-2019 12:26
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 12:26
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	17-Dec-2019 12:26
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 12:26
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	17-Dec-2019 12:26
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 12:26
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	17-Dec-2019 12:26
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 12:26
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	17-Dec-2019 12:26
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	17-Dec-2019 12:26
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 12:26
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	17-Dec-2019 12:26
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	17-Dec-2019 12:26
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 12:26
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	17-Dec-2019 12:26
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 12:26
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 12:26
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	17-Dec-2019 12:26
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	17-Dec-2019 12:26
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	17-Dec-2019 12:26
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	17-Dec-2019 12:26
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 12:26
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 12:26
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 12:26

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

Revision: 1

ALS Houston, US

Date: 05-Jan-20

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP/Site 18/24
 Sample ID: Trip Blank
 Collection Date: 12-Dec-2019 00:00

ANALYTICAL REPORT
 WorkOrder:HS19120765
 Lab ID:HS19120765-11
 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED	
VOLATILES ORGANICS BY METHOD 8260C		Method:SW8260							Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 12:26	
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 12:26	
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	17-Dec-2019 12:26	
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 12:26	
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 12:26	
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 12:26	
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 12:26	
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	UG/L	1	17-Dec-2019 12:26	
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 12:26	
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	17-Dec-2019 12:26	
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	17-Dec-2019 12:26	
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	17-Dec-2019 12:26	
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 12:26	
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 12:26	
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 12:26	
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 12:26	
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 12:26	
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 12:26	
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 12:26	
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 12:26	
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 12:26	
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 12:26	
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 12:26	
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	17-Dec-2019 12:26	
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	17-Dec-2019 12:26	
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>89.8</i>			<i>0</i>	<i>81-118</i>	<i>%REC</i>	<i>1</i>	<i>17-Dec-2019 12:26</i>	
<i>Surr: 4-Bromofluorobenzene</i>	<i>99.9</i>			<i>0</i>	<i>85-114</i>	<i>%REC</i>	<i>1</i>	<i>17-Dec-2019 12:26</i>	
<i>Surr: Dibromofluoromethane</i>	<i>92.0</i>			<i>0</i>	<i>80-119</i>	<i>%REC</i>	<i>1</i>	<i>17-Dec-2019 12:26</i>	
<i>Surr: Toluene-d8</i>	<i>101</i>			<i>0</i>	<i>89-112</i>	<i>%REC</i>	<i>1</i>	<i>17-Dec-2019 12:26</i>	

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

Revision: 1

Weight / Prep Log

Client: Bhate Environmental Associates, Inc.

Project: LHAAP/Site 18/24

WorkOrder: HS19120765

Batch ID: 148874	Start Date: 18 Dec 2019 07:00	End Date: 18 Dec 2019 16:00
Method: SV AQ SEP FUN EXTRACT-LOWLEV - 3510C	Prep Code: 3510_B_SIM	

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19120765-01	1	1000 (mL)	1 (mL)	0.001
HS19120765-02	1	1000 (mL)	1 (mL)	0.001
HS19120765-03	1	1000 (mL)	1 (mL)	0.001
HS19120765-04	1	1000 (mL)	1 (mL)	0.001
HS19120765-05	1	1000 (mL)	1 (mL)	0.001
HS19120765-06	1	1000 (mL)	1 (mL)	0.001

Batch ID: 149099	Start Date: 24 Dec 2019 10:30	End Date: 24 Dec 2019 12:30
Method: MERCURY PREP BY 7470A- WATER	Prep Code: HG_WPR	

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19120765-01		10 (mL)	10 (mL)	1
HS19120765-02		10 (mL)	10 (mL)	1
HS19120765-03		10 (mL)	10 (mL)	1
HS19120765-04		10 (mL)	10 (mL)	1
HS19120765-07		10 (mL)	10 (mL)	1
HS19120765-10		10 (mL)	10 (mL)	1

Batch ID: 149105	Start Date: 24 Dec 2019 12:00	End Date: 24 Dec 2019 16:00
Method: WATER - SW3010A	Prep Code: 3010A	

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19120765-01		10 (mL)	10 (mL)	1
HS19120765-02		10 (mL)	10 (mL)	1
HS19120765-03		10 (mL)	10 (mL)	1
HS19120765-04		10 (mL)	10 (mL)	1
HS19120765-07		10 (mL)	10 (mL)	1
HS19120765-10		10 (mL)	10 (mL)	1

ALS Houston, US

Date: 05-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: LHAAP/Site 18/24
WorkOrder: HS19120765

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: 148874 (0)		Test Name : SEMIVOLATILES SIM			Matrix: Groundwater	
HS19120765-01	18WW22_121219	12 Dec 2019 08:05		18 Dec 2019 16:40	23 Dec 2019 12:51	5
HS19120765-02	18WW22_121219_a	12 Dec 2019 08:05		18 Dec 2019 16:40	23 Dec 2019 13:10	5
HS19120765-03	C08_121219	12 Dec 2019 09:00		18 Dec 2019 16:40	23 Dec 2019 13:29	5
HS19120765-04	18CPTMW24_121219	12 Dec 2019 09:50		18 Dec 2019 16:40	23 Dec 2019 13:49	10
HS19120765-05	18CPTMW07_121219	12 Dec 2019 10:45		18 Dec 2019 16:40	23 Dec 2019 14:08	5
HS19120765-06	109_121219	12 Dec 2019 11:35		18 Dec 2019 16:40	23 Dec 2019 14:27	10
Batch ID: 149099 (0)		Test Name : MERCURY BY SW7470A			Matrix: Groundwater	
HS19120765-01	18WW22_121219	12 Dec 2019 08:05		24 Dec 2019 10:30	24 Dec 2019 17:22	1
HS19120765-02	18WW22_121219_a	12 Dec 2019 08:05		24 Dec 2019 10:30	24 Dec 2019 17:24	1
HS19120765-03	C08_121219	12 Dec 2019 09:00		24 Dec 2019 10:30	24 Dec 2019 17:26	1
HS19120765-04	18CPTMW24_121219	12 Dec 2019 09:50		24 Dec 2019 10:30	24 Dec 2019 17:27	1
HS19120765-07	MW3_121219	12 Dec 2019 12:30		24 Dec 2019 10:30	24 Dec 2019 17:29	1
HS19120765-10	125_121219	12 Dec 2019 13:40		24 Dec 2019 10:30	24 Dec 2019 17:31	1
Batch ID: 149105 (0)		Test Name : METALS BY ICPMS BY SW6020A			Matrix: Groundwater	
HS19120765-01	18WW22_121219	12 Dec 2019 08:05		24 Dec 2019 16:00	27 Dec 2019 14:28	1
HS19120765-02	18WW22_121219_a	12 Dec 2019 08:05		24 Dec 2019 16:00	27 Dec 2019 14:30	1
HS19120765-03	C08_121219	12 Dec 2019 09:00		24 Dec 2019 16:00	27 Dec 2019 15:29	20
HS19120765-03	C08_121219	12 Dec 2019 09:00		24 Dec 2019 16:00	27 Dec 2019 14:39	1
HS19120765-04	18CPTMW24_121219	12 Dec 2019 09:50		24 Dec 2019 16:00	27 Dec 2019 15:32	20
HS19120765-04	18CPTMW24_121219	12 Dec 2019 09:50		24 Dec 2019 16:00	27 Dec 2019 14:42	1
HS19120765-07	MW3_121219	12 Dec 2019 12:30		24 Dec 2019 16:00	27 Dec 2019 15:51	20
HS19120765-07	MW3_121219	12 Dec 2019 12:30		24 Dec 2019 16:00	27 Dec 2019 14:44	1
HS19120765-10	125_121219	12 Dec 2019 13:40		24 Dec 2019 16:00	27 Dec 2019 14:46	1
Batch ID: R352792 (0)		Test Name : VOLATILES ORGANICS BY METHOD 8260C			Matrix: Water	
HS19120765-11	Trip Blank	12 Dec 2019 00:00			17 Dec 2019 12:26	1

ALS Houston, US

Date: 05-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: LHAAP/Site 18/24
WorkOrder: HS19120765

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R352792 (0)		Test Name : VOLATILES ORGANICS BY METHOD 8260C			Matrix: Groundwater	
HS19120765-01	18WW22_121219	12 Dec 2019 08:05			17 Dec 2019 12:50	1
HS19120765-02	18WW22_121219_a	12 Dec 2019 08:05			17 Dec 2019 13:14	1
HS19120765-03	C08_121219	12 Dec 2019 09:00			17 Dec 2019 13:38	1
HS19120765-04	18CPTMW24_121219	12 Dec 2019 09:50			17 Dec 2019 14:50	1
HS19120765-05	18CPTMW07_121219	12 Dec 2019 10:45			17 Dec 2019 14:02	1
HS19120765-06	109_121219	12 Dec 2019 11:35			17 Dec 2019 18:27	5
HS19120765-06	109_121219	12 Dec 2019 11:35			17 Dec 2019 15:14	1
HS19120765-07	MW3_121219	12 Dec 2019 12:30			17 Dec 2019 18:51	5
HS19120765-07	MW3_121219	12 Dec 2019 12:30			17 Dec 2019 15:38	1
HS19120765-08	MW23_121219	12 Dec 2019 13:20			17 Dec 2019 17:39	100
HS19120765-08	MW23_121219	12 Dec 2019 13:20			17 Dec 2019 16:02	10
HS19120765-09	MW23_121219_a	12 Dec 2019 13:20			17 Dec 2019 18:03	100
HS19120765-09	MW23_121219_a	12 Dec 2019 13:20			17 Dec 2019 16:26	10
HS19120765-10	125_121219	12 Dec 2019 13:40			17 Dec 2019 14:26	1
Batch ID: R353541 (0)		Test Name : SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)			Matrix: Groundwater	
HS19120765-01	18WW22_121219	12 Dec 2019 08:05			30 Dec 2019 17:31	1
HS19120765-02	18WW22_121219_a	12 Dec 2019 08:05			30 Dec 2019 17:31	1
HS19120765-03	C08_121219	12 Dec 2019 09:00			30 Dec 2019 17:31	1
HS19120765-04	18CPTMW24_121219	12 Dec 2019 09:50			30 Dec 2019 17:31	1
HS19120765-05	18CPTMW07_121219	12 Dec 2019 10:45			30 Dec 2019 17:31	1
HS19120765-06	109_121219	12 Dec 2019 11:35			30 Dec 2019 17:31	1
HS19120765-07	MW3_121219	12 Dec 2019 12:30			30 Dec 2019 17:31	1
HS19120765-08	MW23_121219	12 Dec 2019 13:20			30 Dec 2019 17:31	1
HS19120765-09	MW23_121219_a	12 Dec 2019 13:20			30 Dec 2019 17:31	1
HS19120765-10	125_121219	12 Dec 2019 13:40			30 Dec 2019 17:31	1

ALS Houston, US

Date: 05-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: LHAAP/Site 18/24
WorkOrder: HS19120765

QC BATCH REPORT

Batch ID:	149099 (0)	Instrument:	HG03	Method:	MERCURY BY SW7470A													
MBLK	Sample ID: MBLK-149099	Units:	mg/L	Analysis Date:	24-Dec-2019 17:00													
Client ID:	Run ID: HG03_353245	SeqNo:	5408656	PrepDate:	24-Dec-2019	DF:	1											
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual								
Mercury	0.000100	0.000200								U								
LCS	Sample ID: LCS-149099	Units:	mg/L	Analysis Date:	24-Dec-2019 17:02													
Client ID:	Run ID: HG03_353245	SeqNo:	5408657	PrepDate:	24-Dec-2019	DF:	1											
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual								
Mercury	0.00500	0.000200	0.005	0	100	82 - 119												
MS	Sample ID: HS19120702-03MS	Units:	mg/L	Analysis Date:	24-Dec-2019 17:05													
Client ID:	Run ID: HG03_353245	SeqNo:	5408659	PrepDate:	24-Dec-2019	DF:	1											
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual								
Mercury	0.00495	0.000200	0.005	-0.000005000	99.1	82 - 119												
MSD	Sample ID: HS19120702-03MSD	Units:	mg/L	Analysis Date:	24-Dec-2019 17:07													
Client ID:	Run ID: HG03_353245	SeqNo:	5408660	PrepDate:	24-Dec-2019	DF:	1											
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual								
Mercury	0.00505	0.000200	0.005	-0.000005000	101	82 - 119	0.004950		2	20								
The following samples were analyzed in this batch:																		
<table border="1"> <tr> <td>HS19120765-01</td> <td>HS19120765-02</td> <td>HS19120765-03</td> <td>HS19120765-04</td> </tr> <tr> <td>HS19120765-07</td> <td>HS19120765-10</td> <td></td> <td></td> </tr> </table>											HS19120765-01	HS19120765-02	HS19120765-03	HS19120765-04	HS19120765-07	HS19120765-10		
HS19120765-01	HS19120765-02	HS19120765-03	HS19120765-04															
HS19120765-07	HS19120765-10																	

Revision: 1

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ALS Houston, US

Date: 05-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: LHAAP/Site 18/24
WorkOrder: HS19120765

QC BATCH REPORT

Batch ID: 149105 (0)		Instrument: ICPMS05		Method: METALS BY ICPMS BY SW6020A						
MBLK	Sample ID: MBLK-149105	Units: mg/L			Analysis Date: 27-Dec-2019 13:25					
Client ID:	Run ID: ICPMS05_353383	SeqNo: 5412799	PrepDate: 24-Dec-2019	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.004238	0.0100								J
Antimony	0.000500	0.00500								U
Arsenic	0.000500	0.00500								U
Barium	0.00250	0.00500								U
Beryllium	0.000500	0.00200								U
Cadmium	0.000500	0.00200								U
Calcium	0.05506	0.500								J
Chromium	0.000500	0.00500								U
Cobalt	0.000500	0.00500								U
Copper	0.00250	0.00500								U
Iron	0.1659	0.200								J
Lead	0.00100	0.00500								U
Magnesium	0.0500	0.200								U
Manganese	0.000962	0.00500								J
Nickel	0.00100	0.00500								U
Potassium	0.0500	0.200								U
Selenium	0.00250	0.00500								U
Silver	0.000500	0.00500								U
Sodium	0.0500	0.200								U
Thallium	0.000500	0.00200								U
Vanadium	0.00100	0.00500								U
Zinc	0.00250	0.00500								U

Revision: 1

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ALS Houston, US

Date: 05-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: LHAAP/Site 18/24
WorkOrder: HS19120765

QC BATCH REPORT

Batch ID: 149105 (0)		Instrument: ICPMS05			Method: METALS BY ICPMS BY SW6020A					
LCS	Sample ID: LCS-149105	Units: mg/L			Analysis Date: 27-Dec-2019 14:33					
Client ID:	Run ID: ICPMS05_353383	SeqNo: 5412820			PrepDate: 24-Dec-2019		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.09227	0.0100	0.1	0	92.3	84 - 117				
Antimony	0.05171	0.00500	0.05	0	103	85 - 117				
Arsenic	0.05071	0.00500	0.05	0	101	84 - 116				
Barium	0.04742	0.00500	0.05	0	94.8	86 - 114				
Beryllium	0.04757	0.00200	0.05	0	95.1	83 - 121				
Cadmium	0.04941	0.00200	0.05	0	98.8	87 - 115				
Calcium	5.231	0.500	5	0	105	87 - 118				
Chromium	0.04905	0.00500	0.05	0	98.1	85 - 116				
Cobalt	0.04929	0.00500	0.05	0	98.6	86 - 115				
Copper	0.04986	0.00500	0.05	0	99.7	85 - 118				
Iron	5.023	0.200	5	0	100	87 - 118				
Lead	0.04781	0.00500	0.05	0	95.6	88 - 115				
Magnesium	5.31	0.200	5	0	106	83 - 118				
Manganese	0.04872	0.00500	0.05	0	97.4	87 - 115				
Nickel	0.05058	0.00500	0.05	0	101	85 - 117				
Potassium	5.146	0.200	5	0	103	87 - 115				
Selenium	0.0501	0.00500	0.05	0	100	80 - 120				
Silver	0.04799	0.00500	0.05	0	96.0	85 - 116				
Sodium	5.351	0.200	5	0	107	85 - 117				
Thallium	0.04462	0.00200	0.05	0	89.2	82 - 116				
Vanadium	0.04983	0.00500	0.05	0	99.7	86 - 115				
Zinc	0.05178	0.00500	0.05	0	104	83 - 119				

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Client: Bhate Environmental Associates, Inc.
Project: LHAAP/Site 18/24
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QC BATCH REPORT

Batch ID: 149105 (0)		Instrument: ICPMS05			Method: METALS BY ICPMS BY SW6020A					
MS	Sample ID: HS19120702-03MS	Units: mg/L			Analysis Date: 27-Dec-2019 16:20					
Client ID:	Run ID: ICPMS05_353383	SeqNo: 5412902			PrepDate: 24-Dec-2019		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.1096	0.0100	0.1	0.02447	85.2	84 - 117				
Antimony	0.05121	0.00500	0.05	0.000693	101	85 - 117				
Arsenic	0.05093	0.00500	0.05	0.0013	99.3	84 - 116				
Barium	0.9021	0.00500	0.05	1.115	-425	86 - 114				SO
Cadmium	0.04632	0.00200	0.05	0.0005	91.6	87 - 115				
Calcium	72.84	0.500	5	90.85	-360	87 - 118				SO
Chromium	0.5436	0.00500	0.05	0.6401	-193	85 - 116				SO
Cobalt	0.05631	0.00500	0.05	0.01007	92.5	86 - 115				
Copper	0.0567	0.00500	0.05	0.0109	91.6	85 - 118				
Lead	0.04614	0.00500	0.05	0	92.3	88 - 115				
Magnesium	31.35	0.200	5	33.71	-47.2	83 - 118				SO
Manganese	0.2371	0.00500	0.05	0.2568	-39.2	87 - 115				SO
Nickel	0.2751	0.00500	0.05	0.2826	-15.1	85 - 117				SO
Potassium	6.969	0.200	5	2.068	98.0	87 - 115				
Selenium	0.0481	0.00500	0.05	0	96.2	80 - 120				
Silver	0.04409	0.00500	0.05	0	88.2	85 - 116				
Sodium	353.2	0.200	5	417.6	-1290	85 - 117				SEO
Thallium	0.04258	0.00200	0.05	0	85.2	82 - 116				
Vanadium	0.05168	0.00500	0.05	0.003369	96.6	86 - 115				
Zinc	0.0596	0.00500	0.05	0.003288	113	83 - 119				

MS	Sample ID: HS19120702-03MS	Units: mg/L			Analysis Date: 27-Dec-2019 14:14					
Client ID:	Run ID: ICPMS05_353383	SeqNo: 5412813			PrepDate: 24-Dec-2019		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	0.05441	0.00200	0.05	-0.000001	109	83 - 121				
Iron	11.63	0.200	5	6.062	111	87 - 118				

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Date: 05-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: LHAAP/Site 18/24
WorkOrder: HS19120765

QC BATCH REPORT

Batch ID: 149105 (0)		Instrument: ICPMS05			Method: METALS BY ICPMS BY SW6020A					
MSD	Sample ID: HS19120702-03MSD	Units: mg/L			Analysis Date: 27-Dec-2019 14:16					
Client ID:	Run ID: ICPMS05_353383	SeqNo: 5412814		PrepDate: 24-Dec-2019		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.131	0.0100	0.1	0.02447	107	84 - 117	0.1248	4.86	20	
Beryllium	0.05487	0.00200	0.05	-0.000001	110	83 - 121	0.05441	0.831	20	
Iron	11.43	0.200	5	6.062	107	87 - 118	11.63	1.74	20	
MSD	Sample ID: HS19120702-03MSD	Units: mg/L			Analysis Date: 27-Dec-2019 16:22					
Client ID:	Run ID: ICPMS05_353383	SeqNo: 5412903		PrepDate: 24-Dec-2019		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05219	0.00500	0.05	0.000693	103	85 - 117	0.05121	1.88	20	
Arsenic	0.0529	0.00500	0.05	0.0013	103	84 - 116	0.05093	3.8	20	
Barium	0.99	0.00500	0.05	1.115	-249	86 - 114	0.9021	9.3	20	SO
Cadmium	0.04901	0.00200	0.05	0.0005	97.0	87 - 115	0.04632	5.64	20	
Calcium	74.37	0.500	5	90.85	-330	87 - 118	72.84	2.07	20	SO
Chromium	0.5638	0.00500	0.05	0.6401	-153	85 - 116	0.5436	3.64	20	SO
Cobalt	0.05778	0.00500	0.05	0.01007	95.4	86 - 115	0.05631	2.58	20	
Copper	0.05693	0.00500	0.05	0.0109	92.0	85 - 118	0.0567	0.403	20	
Lead	0.04959	0.00500	0.05	0	99.2	88 - 115	0.04614	7.2	20	
Magnesium	32.11	0.200	5	33.71	-32.1	83 - 118	31.35	2.39	20	SO
Manganese	0.2455	0.00500	0.05	0.2568	-22.6	87 - 115	0.2371	3.46	20	SO
Nickel	0.2784	0.00500	0.05	0.2826	-8.52	85 - 117	0.2751	1.19	20	SO
Potassium	6.782	0.200	5	2.068	94.3	87 - 115	6.969	2.72	20	
Selenium	0.04645	0.00500	0.05	0	92.9	80 - 120	0.0481	3.5	20	
Silver	0.04697	0.00500	0.05	0	93.9	85 - 116	0.04409	6.33	20	
Sodium	355.3	0.200	5	417.6	-1250	85 - 117	353.2	0.58	20	SEO
Thallium	0.04625	0.00200	0.05	0	92.5	82 - 116	0.04258	8.27	20	
Vanadium	0.0527	0.00500	0.05	0.003369	98.7	86 - 115	0.05168	1.95	20	
Zinc	0.05108	0.00500	0.05	0.003288	95.6	83 - 119	0.0596	15.4	20	

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QC BATCH REPORT

Batch ID: 149105 (0)		Instrument: ICPMS05		Method: METALS BY ICPMS BY SW6020A					
PDS	Sample ID: HS19120702-03PDS	Units: mg/L			Analysis Date: 27-Dec-2019 14:19				
Client ID:	Run ID: ICPMS05_353383	SeqNo: 5412815		PrepDate: 24-Dec-2019		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Antimony	0.08256	0.00500	0.1	0.000693	81.9	80 - 120			
Arsenic	0.0932	0.00500	0.1	0.0013	91.9	80 - 120			
Barium	1.135	0.00500	0.1	1.115	20.3	80 - 120			SO
Cadmium	0.08881	0.00200	0.1	0.0005	88.3	80 - 120			
Calcium	94.39	0.500	10	90.85	35.5	80 - 120			SO
Chromium	0.6802	0.00500	0.1	0.6401	40.2	80 - 120			SO
Cobalt	0.09637	0.00500	0.1	0.01007	86.3	80 - 120			
Copper	0.09484	0.00500	0.1	0.0109	83.9	80 - 120			
Iron	14.45	0.200	10	6.062	83.8	80 - 120			
Lead	0.08693	0.00500	0.1	0.00013	86.8	80 - 120			
Potassium	10.8	0.200	10	2.068	87.3	80 - 120			
Selenium	0.086	0.00500	0.1	0.00011	85.9	80 - 120			
Silver	0.08364	0.00500	0.1	0.000013	83.6	80 - 120			
Thallium	0.08765	0.00200	0.1	0.000014	87.6	80 - 120			
Vanadium	0.09222	0.00500	0.1	0.003369	88.8	80 - 120			
Zinc	0.09081	0.00500	0.1	0.003288	87.5	80 - 120			
PDS	Sample ID: HS19120702-03PDS	Units: mg/L			Analysis Date: 27-Dec-2019 16:29				
Client ID:	Run ID: ICPMS05_353383	SeqNo: 5412906		PrepDate: 24-Dec-2019		DF: 10			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Barium	1.989	0.0500	1	0.8967	109	80 - 120			
Calcium	179.2	5.00	100	74.05	105	80 - 120			
Chromium	1.633	0.0500	1	0.52	111	80 - 120			
Sodium	495.9	2.00	100	375.2	121	80 - 120			S

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Client: Bhate Environmental Associates, Inc.
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WorkOrder: HS19120765

QC BATCH REPORT

Batch ID: 149105 (0)		Instrument: ICPMS05		Method: METALS BY ICPMS BY SW6020A						
SD	Sample ID: HS19120702-03SD	Units: mg/L		Analysis Date: 27-Dec-2019 14:12						
Client ID:	Run ID: ICPMS05_353383	SeqNo: 5412812	PrepDate: 24-Dec-2019	DF: 5						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Aluminum	0.01228	0.0500					0.02447	0	10	J
Antimony	0.00250	0.0250					0.000693	0	10	U
Arsenic	0.00250	0.0250					0.0013	0	10	U
Beryllium	0.00250	0.0100					-0.000001	0	10	U
Cadmium	0.00250	0.0100					0.0005	0	10	U
Cobalt	0.009437	0.0250					0.01007	0	10	J
Copper	0.01067	0.0250					0.0109	0	10	J
Iron	5.55	1.00					6.062	8.46	10	
Lead	0.00500	0.0250					0.00013	0	10	U
Magnesium	31.48	1.00					33.71	6.62	10	
Manganese	0.2333	0.0250					0.2568	9.15	10	
Nickel	0.2685	0.0250					0.2826	4.99	10	
Potassium	1.943	1.00					2.068	6.03	10	
Selenium	0.0125	0.0250					0.00011	0	10	U
Silver	0.00250	0.0250					0.000013	0	10	U
Sodium	396.1	1.00					417.6	5.15	10	
Thallium	0.00250	0.0100					0.000014	0	10	U
Vanadium	0.005733	0.0250					0.003369	0	10	J
Zinc	0.0125	0.0250					0.003288	0	10	U

SD	Sample ID: HS19120702-03SD	Units: mg/L		Analysis Date: 27-Dec-2019 16:26						
Client ID:	Run ID: ICPMS05_353383	SeqNo: 5412905	PrepDate: 24-Dec-2019	DF: 50						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Barium	0.9191	0.250					0.8967	2.49	10	
Calcium	72.7	25.0					74.05	1.82	10	
Chromium	0.5425	0.250					0.52	4.32	10	
Sodium	379.9	10.0					375.2	1.26	10	

The following samples were analyzed in this batch:

HS19120765-01	HS19120765-02	HS19120765-03	HS19120765-04
HS19120765-07	HS19120765-10		

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Date: 05-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: LHAAP/Site 18/24
WorkOrder: HS19120765

QC BATCH REPORT

Batch ID: 148874 (0)		Instrument: SV-6		Method: SEMIVOLATILES SIM						
MBLK	Sample ID: MBLK-148874	Units: ug/L			Analysis Date: 23-Dec-2019 08:23					
Client ID:	Run ID: SV-6_353137	SeqNo: 5405871		PrepDate: 18-Dec-2019		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,4-Dioxane	0.010	0.010								U
Surr: 2-Fluorobiphenyl	0.08477	0	0.08	0	106	40 - 140				
Surr: 4-Terphenyl-d14	0.07433	0	0.08	0	92.9	40 - 140				
Surr: Nitrobenzene-d5	0.09568	0	0.08	0	120	40 - 140				
LCS	Sample ID: LCS-148874	Units: ug/L			Analysis Date: 23-Dec-2019 08:42					
Client ID:	Run ID: SV-6_353137	SeqNo: 5405872		PrepDate: 18-Dec-2019		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,4-Dioxane	0.08006	0.010	0.08	0	100	40 - 140				
Surr: 2-Fluorobiphenyl	0.08232	0	0.08	0	103	40 - 140				
Surr: 4-Terphenyl-d14	0.07833	0	0.08	0	97.9	40 - 140				
Surr: Nitrobenzene-d5	0.08773	0	0.08	0	110	40 - 140				
LCSD	Sample ID: LCSD-148874	Units: ug/L			Analysis Date: 23-Dec-2019 09:02					
Client ID:	Run ID: SV-6_353137	SeqNo: 5405873		PrepDate: 18-Dec-2019		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,4-Dioxane	0.07024	0.010	0.08	0	87.8	40 - 140	0.08006	13.1	20	
Surr: 2-Fluorobiphenyl	0.1454	0	0.16	0	90.9	40 - 140	0.08232	55.4	20	R
Surr: 4-Terphenyl-d14	0.146	0	0.16	0	91.2	40 - 140	0.07833	60.3	20	R
Surr: Nitrobenzene-d5	0.1532	0	0.16	0	95.8	40 - 140	0.08773	54.4	20	R
The following samples were analyzed in this batch:										
HS19120765-01		HS19120765-02		HS19120765-03		HS19120765-04				
HS19120765-05		HS19120765-06								

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Date: 05-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: LHAAP/Site 18/24
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QC BATCH REPORT

Batch ID: R352792 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MBLK	Sample ID: VBLKW-191217	Units: UG/L			Analysis Date: 17-Dec-2019 12:02					
Client ID:	Run ID: VOA6_352792	SeqNo: 5397527	PrepDate:	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	0.50	1.0								U
1,1,1-Trichloroethane	0.50	1.0								U
1,1,2,2-Tetrachloroethane	0.50	1.0								U
1,1,2-Trichloroethane	0.50	1.0								U
1,1-Dichloroethane	0.50	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,1-Dichloropropene	0.50	1.0								U
1,2,3-Trichlorobenzene	0.50	1.0								U
1,2,3-Trichloropropane	0.50	1.0								U
1,2,4-Trichlorobenzene	0.50	1.0								U
1,2,4-Trimethylbenzene	0.50	1.0								U
1,2-Dibromo-3-chloropropane	0.50	1.0								U
1,2-Dibromoethane	0.50	1.0								U
1,2-Dichlorobenzene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
1,2-Dichloropropane	0.50	1.0								U
1,3,5-Trimethylbenzene	0.50	1.0								U
1,3-Dichlorobenzene	0.50	1.0								U
1,3-Dichloropropane	0.50	1.0								U
1,4-Dichlorobenzene	0.50	1.0								U
2,2-Dichloropropane	0.50	1.0								U
2-Butanone	1.0	2.0								U
2-Chlorotoluene	0.50	1.0								U
2-Hexanone	1.0	2.0								U
4-Chlorotoluene	0.50	1.0								U
4-Isopropyltoluene	0.50	1.0								U
4-Methyl-2-pentanone	1.0	2.0								U
Acetone	1.0	2.0								U
Benzene	0.50	1.0								U
Bromobenzene	0.50	1.0								U
Bromochloromethane	0.50	1.0								U
Bromodichloromethane	0.50	1.0								U
Bromoform	0.50	1.0								U
Bromomethane	0.50	1.0								U

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QC BATCH REPORT

Batch ID: R352792 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MBLK	Sample ID: VBLKW-191217	Units: UG/L			Analysis Date: 17-Dec-2019 12:02					
Client ID:	Run ID: VOA6_352792	SeqNo: 5397527	PrepDate:	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	1.0	2.0								U
Carbon tetrachloride	0.50	1.0								U
Chlorobenzene	0.50	1.0								U
Chloroethane	0.50	1.0								U
Chloroform	0.50	1.0								U
Chloromethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
cis-1,3-Dichloropropene	0.50	1.0								U
Dibromochloromethane	0.50	1.0								U
Dibromomethane	0.50	1.0								U
Dichlorodifluoromethane	0.50	1.0								U
Ethylbenzene	0.50	1.0								U
Hexachlorobutadiene	0.50	1.0								U
Isopropylbenzene	0.50	1.0								U
m,p-Xylene	1.0	2.0								U
Methylene chloride	1.0	2.0								U
Naphthalene	0.50	1.0								U
n-Butylbenzene	0.50	1.0								U
n-Propylbenzene	0.50	1.0								U
o-Xylene	0.50	1.0								U
sec-Butylbenzene	0.50	1.0								U
Styrene	0.50	1.0								U
tert-Butylbenzene	0.50	1.0								U
Tetrachloroethene	0.50	1.0								U
Toluene	0.50	1.0								U
trans-1,2-Dichloroethene	0.50	1.0								U
trans-1,3-Dichloropropene	0.50	1.0								U
Trichloroethene	0.50	1.0								U
Trichlorofluoromethane	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	45.12	1.0	50	0	90.2	81 - 118				
Surr: 4-Bromofluorobenzene	49.25	1.0	50	0	98.5	85 - 114				
Surr: Dibromofluoromethane	45.98	1.0	50	0	92.0	80 - 119				
Surr: Toluene-d8	51	1.0	50	0	102	89 - 112				

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QC BATCH REPORT

Batch ID: R352792 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
LCS	Sample ID: VLCSW-191217	Units: UG/L			Analysis Date: 17-Dec-2019 11:14					
Client ID:	Run ID: VOA6_352792	SeqNo: 5397526	PrepDate:	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	20.81	1.0	20	0	104	78 - 124				
1,1,1-Trichloroethane	20.92	1.0	20	0	105	74 - 131				
1,1,2,2-Tetrachloroethane	20.22	1.0	20	0	101	71 - 121				
1,1,2-Trichloroethane	20.54	1.0	20	0	103	80 - 119				
1,1-Dichloroethane	21.94	1.0	20	0	110	77 - 125				
1,1-Dichloroethene	17.57	1.0	20	0	87.9	71 - 131				
1,1-Dichloropropene	21.6	1.0	20	0	108	78 - 125				
1,2,3-Trichlorobenzene	24.53	1.0	20	0	123	69 - 129				
1,2,3-Trichloropropane	20.56	1.0	20	0	103	73 - 122				
1,2,4-Trichlorobenzene	22.98	1.0	20	0	115	69 - 130				
1,2,4-Trimethylbenzene	22.64	1.0	20	0	113	76 - 124				
1,2-Dibromo-3-chloropropane	18.96	1.0	20	0	94.8	62 - 128				
1,2-Dibromoethane	19.71	1.0	20	0	98.6	77 - 121				
1,2-Dichlorobenzene	20.71	1.0	20	0	104	80 - 119				
1,2-Dichloroethane	20.3	1.0	20	0	101	73 - 128				
1,2-Dichloropropane	21.56	1.0	20	0	108	78 - 122				
1,3,5-Trimethylbenzene	23.28	1.0	20	0	116	75 - 124				
1,3-Dichlorobenzene	21.67	1.0	20	0	108	80 - 119				
1,3-Dichloropropane	20.72	1.0	20	0	104	80 - 119				
1,4-Dichlorobenzene	21.28	1.0	20	0	106	79 - 118				
2,2-Dichloropropane	20.81	1.0	20	0	104	60 - 139				
2-Butanone	38.75	2.0	40	0	96.9	56 - 143				
2-Chlorotoluene	23.97	1.0	20	0	120	79 - 122				
2-Hexanone	36.34	2.0	40	0	90.8	57 - 139				
4-Chlorotoluene	22.6	1.0	20	0	113	78 - 122				
4-Isopropyltoluene	23.02	1.0	20	0	115	77 - 127				
4-Methyl-2-pentanone	37.34	2.0	40	0	93.3	67 - 130				
Acetone	29.43	2.0	40	0	73.6	39 - 160				
Benzene	22.39	1.0	20	0	112	79 - 120				
Bromobenzene	22.15	1.0	20	0	111	80 - 120				
Bromochloromethane	20.97	1.0	20	0	105	78 - 123				
Bromodichloromethane	20.68	1.0	20	0	103	79 - 125				
Bromoform	18.76	1.0	20	0	93.8	66 - 130				
Bromomethane	18.13	1.0	20	0	90.7	53 - 141				

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ALS Houston, US

Date: 05-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: LHAAP/Site 18/24
WorkOrder: HS19120765

QC BATCH REPORT

Batch ID: R352792 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
LCS	Sample ID: VLCSW-191217	Units: UG/L			Analysis Date: 17-Dec-2019 11:14					
Client ID:	Run ID: VOA6_352792	SeqNo: 5397526	PrepDate:	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	47.45	2.0	40	0	119	64 - 133				
Carbon tetrachloride	20.16	1.0	20	0	101	72 - 136				
Chlorobenzene	20.88	1.0	20	0	104	82 - 118				
Chloroethane	18.15	1.0	20	0	90.7	60 - 138				
Chloroform	19.96	1.0	20	0	99.8	79 - 124				
Chloromethane	17.48	1.0	20	0	87.4	50 - 139				
cis-1,2-Dichloroethene	22.05	1.0	20	0	110	78 - 123				
cis-1,3-Dichloropropene	21.74	1.0	20	0	109	75 - 124				
Dibromochloromethane	19.94	1.0	20	0	99.7	74 - 126				
Dibromomethane	19.99	1.0	20	0	99.9	79 - 123				
Dichlorodifluoromethane	22.31	1.0	20	0	112	32 - 152				
Ethylbenzene	21.42	1.0	20	0	107	79 - 121				
Hexachlorobutadiene	25.55	1.0	20	0	128	66 - 134				
Isopropylbenzene	21.3	1.0	20	0	106	72 - 131				
m,p-Xylene	42.73	2.0	40	0	107	80 - 121				
Methylene chloride	21	2.0	20	0	105	74 - 124				
Naphthalene	19.29	1.0	20	0	96.5	61 - 128				
n-Butylbenzene	22.56	1.0	20	0	113	75 - 128				
n-Propylbenzene	23.16	1.0	20	0	116	76 - 126				
o-Xylene	21.01	1.0	20	0	105	78 - 122				
sec-Butylbenzene	23.08	1.0	20	0	115	77 - 126				
Styrene	21.07	1.0	20	0	105	78 - 123				
tert-Butylbenzene	23.16	1.0	20	0	116	78 - 124				
Tetrachloroethene	20.48	1.0	20	0	102	74 - 129				
Toluene	21.62	1.0	20	0	108	80 - 121				
trans-1,2-Dichloroethene	22.07	1.0	20	0	110	75 - 124				
trans-1,3-Dichloropropene	20.19	1.0	20	0	101	73 - 127				
Trichloroethene	21.83	1.0	20	0	109	79 - 123				
Trichlorofluoromethane	17.47	1.0	20	0	87.3	65 - 141				
Vinyl chloride	18.44	1.0	20	0	92.2	58 - 137				
Surr: 1,2-Dichloroethane-d4	48.86	1.0	50	0	97.7	81 - 118				
Surr: 4-Bromofluorobenzene	51.8	1.0	50	0	104	85 - 114				
Surr: Dibromofluoromethane	49.87	1.0	50	0	99.7	80 - 119				
Surr: Toluene-d8	48.86	1.0	50	0	97.7	89 - 112				

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ALS Houston, US

Date: 05-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: LHAAP/Site 18/24
WorkOrder: HS19120765

QC BATCH REPORT

Batch ID: R352792 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MS	Sample ID: HS19120765-01MS	Units: UG/L			Analysis Date: 17-Dec-2019 16:50					
Client ID: 18WW22_121219	Run ID: VOA6_352792	SeqNo: 5397539	PrepDate:	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	20.72	1.0	20	0	104	78 - 124				
1,1,1-Trichloroethane	18.99	1.0	20	0	95.0	74 - 131				
1,1,2,2-Tetrachloroethane	21.27	1.0	20	0	106	71 - 121				
1,1,2-Trichloroethane	20.11	1.0	20	0	101	80 - 119				
1,1-Dichloroethane	19.33	1.0	20	0	96.7	77 - 125				
1,1-Dichloroethene	14.52	1.0	20	0	72.6	71 - 131				
1,1-Dichloropropene	20.27	1.0	20	0	101	78 - 125				
1,2,3-Trichlorobenzene	24.73	1.0	20	0	124	69 - 129				
1,2,3-Trichloropropane	21.61	1.0	20	0	108	73 - 122				
1,2,4-Trichlorobenzene	23.32	1.0	20	0	117	69 - 130				
1,2,4-Trimethylbenzene	23.57	1.0	20	0	118	76 - 124				
1,2-Dibromo-3-chloropropane	19.24	1.0	20	0	96.2	62 - 128				
1,2-Dibromoethane	19.74	1.0	20	0	98.7	77 - 121				
1,2-Dichlorobenzene	21.27	1.0	20	0	106	80 - 119				
1,2-Dichloroethane	18.62	1.0	20	0	93.1	73 - 128				
1,2-Dichloropropane	19.81	1.0	20	0	99.1	78 - 122				
1,3,5-Trimethylbenzene	24.23	1.0	20	0	121	75 - 124				
1,3-Dichlorobenzene	21.87	1.0	20	0	109	80 - 119				
1,3-Dichloropropane	20.62	1.0	20	0	103	80 - 119				
1,4-Dichlorobenzene	21.86	1.0	20	0	109	79 - 118				
2,2-Dichloropropane	17.96	1.0	20	0	89.8	60 - 139				
2-Butanone	34.15	2.0	40	0	85.4	56 - 143				
2-Chlorotoluene	24.99	1.0	20	0	125	79 - 122				S
2-Hexanone	36.12	2.0	40	0	90.3	57 - 139				
4-Chlorotoluene	23.46	1.0	20	0	117	78 - 122				
4-Isopropyltoluene	23.82	1.0	20	0	119	77 - 127				
4-Methyl-2-pentanone	38.02	2.0	40	0	95.0	67 - 130				
Acetone	20.87	2.0	40	0	52.2	39 - 160				
Benzene	20.73	1.0	20	0	104	79 - 120				
Bromobenzene	22.61	1.0	20	0	113	80 - 120				
Bromochloromethane	18.4	1.0	20	0	92.0	78 - 123				
Bromodichloromethane	19.07	1.0	20	0	95.4	79 - 125				
Bromoform	18.72	1.0	20	0	93.6	66 - 130				
Bromomethane	9.933	1.0	20	0	49.7	53 - 141				S

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Date: 05-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: LHAAP/Site 18/24
WorkOrder: HS19120765

QC BATCH REPORT

Batch ID: R352792 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MS	Sample ID: HS19120765-01MS	Units: UG/L			Analysis Date: 17-Dec-2019 16:50					
Client ID: 18WW22_121219	Run ID: VOA6_352792	SeqNo: 5397539	PrepDate:	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	33.48	2.0	40	0	83.7	64 - 133				
Carbon tetrachloride	19.09	1.0	20	0	95.4	72 - 136				
Chlorobenzene	20.61	1.0	20	0	103	82 - 118				
Chloroethane	11.99	1.0	20	0	59.9	60 - 138				S
Chloroform	17.95	1.0	20	0	89.7	79 - 124				
Chloromethane	5.66	1.0	20	0	28.3	50 - 139				S
cis-1,2-Dichloroethene	19.68	1.0	20	0	98.4	78 - 123				
cis-1,3-Dichloropropene	19.66	1.0	20	0	98.3	75 - 124				
Dibromochloromethane	19.72	1.0	20	0	98.6	74 - 126				
Dibromomethane	18.17	1.0	20	0	90.9	79 - 123				
Dichlorodifluoromethane	2.522	1.0	20	0	12.6	32 - 152				S
Ethylbenzene	21.52	1.0	20	0	108	79 - 121				
Hexachlorobutadiene	26.22	1.0	20	0	131	66 - 134				
Isopropylbenzene	21.64	1.0	20	0	108	72 - 131				
m,p-Xylene	42.97	2.0	40	0	107	80 - 121				
Methylene chloride	17.92	2.0	20	0	89.6	74 - 124				
Naphthalene	20	1.0	20	0	100	61 - 128				
n-Butylbenzene	23.49	1.0	20	0	117	75 - 128				
n-Propylbenzene	24.69	1.0	20	0	123	76 - 126				
o-Xylene	21.11	1.0	20	0	106	78 - 122				
sec-Butylbenzene	24.49	1.0	20	0	122	77 - 126				
Styrene	20.67	1.0	20	0	103	78 - 123				
tert-Butylbenzene	24.59	1.0	20	0	123	78 - 124				
Tetrachloroethene	20.6	1.0	20	0	103	74 - 129				
Toluene	21.66	1.0	20	0	108	80 - 121				
trans-1,2-Dichloroethene	19.35	1.0	20	0	96.7	75 - 124				
trans-1,3-Dichloropropene	18.98	1.0	20	0	94.9	73 - 127				
Trichloroethene	21.02	1.0	20	0	105	79 - 123				
Trichlorofluoromethane	12.95	1.0	20	0	64.7	65 - 141				S
Vinyl chloride	8.185	1.0	20	0	40.9	58 - 137				S
Surr: 1,2-Dichloroethane-d4	44.76	1.0	50	0	89.5	81 - 118				
Surr: 4-Bromofluorobenzene	49.04	1.0	50	0	98.1	85 - 114				
Surr: Dibromofluoromethane	46.55	1.0	50	0	93.1	80 - 119				
Surr: Toluene-d8	51.5	1.0	50	0	103	89 - 112				

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Date: 05-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: LHAAP/Site 18/24
WorkOrder: HS19120765

QC BATCH REPORT

Batch ID: R352792 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MSD		Sample ID: HS19120765-01MSD		Units: UG/L		Analysis Date: 17-Dec-2019 17:15				
Client ID: 18WW22_121219		Run ID: VOA6_352792		SeqNo: 5397540		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	20.12	1.0	20	0	101	78 - 124	20.72	2.94	20	
1,1,1-Trichloroethane	17.87	1.0	20	0	89.3	74 - 131	18.99	6.11	20	
1,1,2,2-Tetrachloroethane	20.9	1.0	20	0	104	71 - 121	21.27	1.75	20	
1,1,2-Trichloroethane	20.18	1.0	20	0	101	80 - 119	20.11	0.357	20	
1,1-Dichloroethane	18.52	1.0	20	0	92.6	77 - 125	19.33	4.32	20	
1,1-Dichloroethene	13.49	1.0	20	0	67.5	71 - 131	14.52	7.36	20	S
1,1-Dichloropropene	19.24	1.0	20	0	96.2	78 - 125	20.27	5.21	20	
1,2,3-Trichlorobenzene	26.34	1.0	20	0	132	69 - 129	24.73	6.31	20	S
1,2,3-Trichloropropane	21	1.0	20	0	105	73 - 122	21.61	2.87	20	
1,2,4-Trichlorobenzene	23.46	1.0	20	0	117	69 - 130	23.32	0.574	20	
1,2,4-Trimethylbenzene	22.32	1.0	20	0	112	76 - 124	23.57	5.44	20	
1,2-Dibromo-3-chloropropane	20.01	1.0	20	0	100	62 - 128	19.24	3.92	20	
1,2-Dibromoethane	19.22	1.0	20	0	96.1	77 - 121	19.74	2.63	20	
1,2-Dichlorobenzene	20.59	1.0	20	0	103	80 - 119	21.27	3.26	20	
1,2-Dichloroethane	18.43	1.0	20	0	92.1	73 - 128	18.62	1.02	20	
1,2-Dichloropropane	19.4	1.0	20	0	97.0	78 - 122	19.81	2.1	20	
1,3,5-Trimethylbenzene	22.94	1.0	20	0	115	75 - 124	24.23	5.48	20	
1,3-Dichlorobenzene	21.24	1.0	20	0	106	80 - 119	21.87	2.88	20	
1,3-Dichloropropane	20.28	1.0	20	0	101	80 - 119	20.62	1.67	20	
1,4-Dichlorobenzene	20.72	1.0	20	0	104	79 - 118	21.86	5.32	20	
2,2-Dichloropropane	17.27	1.0	20	0	86.3	60 - 139	17.96	3.92	20	
2-Butanone	33.52	2.0	40	0	83.8	56 - 143	34.15	1.86	20	
2-Chlorotoluene	23.53	1.0	20	0	118	79 - 122	24.99	6.02	20	
2-Hexanone	36.78	2.0	40	0	91.9	57 - 139	36.12	1.81	20	
4-Chlorotoluene	22.39	1.0	20	0	112	78 - 122	23.46	4.67	20	
4-Isopropyltoluene	22.58	1.0	20	0	113	77 - 127	23.82	5.34	20	
4-Methyl-2-pentanone	37.81	2.0	40	0	94.5	67 - 130	38.02	0.556	20	
Acetone	21.28	2.0	40	0	53.2	39 - 160	20.87	1.97	20	
Benzene	19.96	1.0	20	0	99.8	79 - 120	20.73	3.74	20	
Bromobenzene	21.93	1.0	20	0	110	80 - 120	22.61	3.09	20	
Bromochloromethane	17.98	1.0	20	0	89.9	78 - 123	18.4	2.29	20	
Bromodichloromethane	18.6	1.0	20	0	93.0	79 - 125	19.07	2.53	20	
Bromoform	18.64	1.0	20	0	93.2	66 - 130	18.72	0.42	20	
Bromomethane	8.794	1.0	20	0	44.0	53 - 141	9.933	12.2	20	S

Revision: 1

ALS Houston, US

Date: 05-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: LHAAP/Site 18/24
WorkOrder: HS19120765

QC BATCH REPORT

Batch ID: R352792 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MSD	Sample ID: HS19120765-01MSD	Units: UG/L			Analysis Date: 17-Dec-2019 17:15					
Client ID: 18WW22_121219	Run ID: VOA6_352792	SeqNo: 5397540	PrepDate:	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	31.69	2.0	40	0	79.2	64 - 133	33.48	5.5	20	
Carbon tetrachloride	18.21	1.0	20	0	91.0	72 - 136	19.09	4.72	20	
Chlorobenzene	20.09	1.0	20	0	100	82 - 118	20.61	2.53	20	
Chloroethane	11.18	1.0	20	0	55.9	60 - 138	11.99	6.98	20	S
Chloroform	17.22	1.0	20	0	86.1	79 - 124	17.95	4.16	20	
Chloromethane	5.209	1.0	20	0	26.0	50 - 139	5.66	8.3	20	S
cis-1,2-Dichloroethene	19.03	1.0	20	0	95.2	78 - 123	19.68	3.34	20	
cis-1,3-Dichloropropene	19.41	1.0	20	0	97.0	75 - 124	19.66	1.31	20	
Dibromochloromethane	19.55	1.0	20	0	97.8	74 - 126	19.72	0.869	20	
Dibromomethane	18.04	1.0	20	0	90.2	79 - 123	18.17	0.754	20	
Dichlorodifluoromethane	2.403	1.0	20	0	12.0	32 - 152	2.522	4.83	20	S
Ethylbenzene	20.83	1.0	20	0	104	79 - 121	21.52	3.24	20	
Hexachlorobutadiene	24.32	1.0	20	0	122	66 - 134	26.22	7.52	20	
Isopropylbenzene	20.84	1.0	20	0	104	72 - 131	21.64	3.75	20	
m,p-Xylene	41.22	2.0	40	0	103	80 - 121	42.97	4.16	20	
Methylene chloride	17.26	2.0	20	0	86.3	74 - 124	17.92	3.8	20	
Naphthalene	21.77	1.0	20	0	109	61 - 128	20	8.47	20	
n-Butylbenzene	22.31	1.0	20	0	112	75 - 128	23.49	5.15	20	
n-Propylbenzene	22.97	1.0	20	0	115	76 - 126	24.69	7.2	20	
o-Xylene	20.36	1.0	20	0	102	78 - 122	21.11	3.6	20	
sec-Butylbenzene	22.88	1.0	20	0	114	77 - 126	24.49	6.78	20	
Styrene	19.5	1.0	20	0	97.5	78 - 123	20.67	5.83	20	
tert-Butylbenzene	23.14	1.0	20	0	116	78 - 124	24.59	6.07	20	
Tetrachloroethene	19.57	1.0	20	0	97.9	74 - 129	20.6	5.08	20	
Toluene	20.78	1.0	20	0	104	80 - 121	21.66	4.15	20	
trans-1,2-Dichloroethene	18.08	1.0	20	0	90.4	75 - 124	19.35	6.78	20	
trans-1,3-Dichloropropene	18.74	1.0	20	0	93.7	73 - 127	18.98	1.29	20	
Trichloroethene	19.79	1.0	20	0	99.0	79 - 123	21.02	6.01	20	
Trichlorofluoromethane	12.08	1.0	20	0	60.4	65 - 141	12.95	6.91	20	S
Vinyl chloride	7.643	1.0	20	0	38.2	58 - 137	8.185	6.85	20	S
Surr: 1,2-Dichloroethane-d4	44.34	1.0	50	0	88.7	81 - 118	44.76	0.94	20	
Surr: 4-Bromofluorobenzene	49.61	1.0	50	0	99.2	85 - 114	49.04	1.16	20	
Surr: Dibromofluoromethane	45.87	1.0	50	0	91.7	80 - 119	46.55	1.48	20	
Surr: Toluene-d8	51.11	1.0	50	0	102	89 - 112	51.5	0.775	20	

Revision: 1

ALS Houston, US

Date: 05-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: LHAAP/Site 18/24
WorkOrder: HS19120765

QC BATCH REPORT

Batch ID: R352792 (0)	Instrument: VOA6	Method: VOLATILES ORGANICS BY METHOD 8260C	
The following samples were analyzed in this batch:			
HS19120765-01	HS19120765-02	HS19120765-03	HS19120765-04
HS19120765-05	HS19120765-06	HS19120765-07	HS19120765-08
HS19120765-09	HS19120765-10	HS19120765-11	

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Date: 05-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: LHAAP/Site 18/24
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**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 Quantitation 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	19-028-0	27-Mar-2020
California	2919, 2019-2020	30-Apr-2020
Dept of Defense	ANAB L2231	20-Dec-2021
Florida	E87611-28	30-Jun-2020
Illinois	2000322019-2	09-May-2020
Kansas	E-10352 2019-2020	31-Jul-2020
Kentucky	123043, 2019-2020	30-Apr-2020
Louisiana	03087, 2019-2020	30-Jun-2020
Maryland	343, 2019-2020	30-Jun-2020
North Dakota	R-193 2019-2020	30-Apr-2020
Oklahoma	2019-067	31-Aug-2020
Texas	TX104704231-19-23	30-Apr-2020

Client: Bhate Environmental Associates, Inc.**Project:** LHAAP/Site 18/24**Work Order:** HS19120765**SAMPLE TRACKING**

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS19120765-01	18WW22_121219	Login	12/14/2019 1:11:22 PM	JRM	MET099
HS19120765-01	18WW22_121219	Login	12/14/2019 1:11:22 PM	JRM	Sub
HS19120765-01	18WW22_121219	Login	12/14/2019 1:11:22 PM	JRM	EXT050
HS19120765-01	18WW22_121219	Login	12/14/2019 1:11:22 PM	JRM	VOA004

Sample Receipt Checklist

Client Name: Bhate Environmental
 Work Order: HS19120765

Date/Time Received: **13-Dec-2019 09:00**
 Received by: **JRM**

Checklist completed by: Sonia West 14-Dec-2019
 eSignature Date

Reviewed by: RJ Modashia 16-Dec-2019
 eSignature Date

Matrices: **Water**

Carrier name: **FedEx Priority Overnight**

- Shipping container/cooler in good condition? Yes No Not Present
- Custody seals intact on shipping container/cooler? Yes No Not Present
- Custody seals intact on sample bottles? Yes No Not Present
- 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):

Cooler(s)/Kit(s):

Date/Time sample(s) sent to storage:

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:



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 18/24

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 (*)	Sample Number (*)	Sample Matrix (*)	Sample Analysis Requested ⁽⁵⁾				Quality Assurance Samples ⁽⁶⁾			Cooler ID	
							VOC	PERCHLORATE	TOTAL METALS	1, 4 - DIOXANE	Ambient Blank Lot Control Number	Equipment Blank Lot Control Number	Trip Blank Lot Control Number		
18WW22-121219	12Dec2019	0805	-	N	6	WG	6	X	X	X					
18WW22-121219-w	12Dec2019	0805	-	FD	6	WG	6	X	X	X					
C08-121219	12Dec2019	0900	-	N	6	WG	6	X	X	X					
18CPTMW24-121219	12Dec2019	0950	-	N	6	WG	6	X	X	X					
18CPTMW07-121219	12Dec2019	1045	-	N	5	WG	5	X	X	X					
109-121219	12Dec2019	1135	-	N	5	WG	5	X	X	X					
MW3-121219	12Dec2019	1230	-	N	5	WG	5	X	X	X					
MW23-121219	12Dec2019	1320	-	N	4	WG	4	X	X						
MW23-121219-a	12Dec2019	1330	-	FD	4	WG	4	X	X						
125-121219	12Dec2019	1340	-	N	5	WG	5	X	X	X					
TRIP BLANK	12Dec2019		-	TB	2	W	2	X							

HS19120765

Bhate Environmental Associates, Inc.
 LHAAP/Site 18/24



COMMENTS:

416
 45581 21 11A-0
 TR 11


Custody Transfers Prior to Receipt by Laboratory

Relinquished By (Signed)	Date	Time	Received by (signed)	Date	Time
<u>Scott Beesinger</u>	<u>12/12/19</u>	<u>1500</u>	<u>Jim</u>	<u>12/13/19</u>	<u>9:00</u>
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 77029 (281) 530-5656
 ATTN: SONIA WEST Lab Recipient: _____ Delivery Date/Time: _____

- 1.) Chain of Custody Number = date collected + custody number (e.g. 09-02-1999-01)
- 2.) Sample Type (SA) Codes: N = Normal Sample, TB = Trip Blank (-c) Sample, FD = Field Duplicate (-a) Samples, FR = Field Replicate (-b) Samples, EB = Equipment Blank (-d) Samples, MS = Matrix Spike, SD = Matrix Spike Duplicate, AB = Ambient Blank (-e)
- 3.) Sample Number: Unique sample number collected from a particular location per day. (e.g. Groundwater sample collected from MW-1 on 10/10/99 = 01, if sampled again on 10/10/99 = 02, etc.)
- 4.) Matrix Codes: GS = Soil Gas, WG = Groundwater, WS = Surface Water, SO = Soil, SE = Sediment, SL = Sludge, SS = Surface Soil Samples, WQ = Aqueous Blank Samples (trip, equipment, ambient, etc), SQ = Soil Blanks
- 5.) Sample Analysis Requested: Analytical method requested and number of containers provided for each.
- 6.) Quality assurance samples are assigned by date (ddmmyy) and the sample number associated with the sample (01, 02, etc) (e.g. Equipment blank collected in association with MW-1 on 10/10/99 will be designated 10109901 in the Equipment Blank Lot Control

 ALS 10450 Stancliff Rd., Suite 210 Houston, Texas 77099 Tel. +1 281 530 5656 Fax. +1 281 530 5887	CUSTODY SEAL		Seal Broken By: <i>M</i>
	Date: 12/12/19	Time: 1500	Date: 12/13/19
	Name: Scott Beechner		Company: BHATE

45581 DEC 13 2019



Must Deliver Next Business Day
Time and Temperature Sensitive!

45581

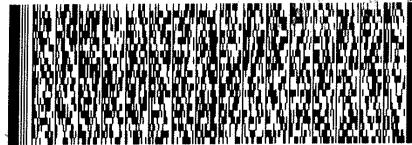
ORIGIN ID:SGRA (903) 930-6193
 SCOTT BEECHNER
 BHATE ENVIRONMENTAL ASSOCIATES
 1203-B EAST GRAND AVE. PMB202
 MARSHALL, TX 75670
 UNITED STATES US

SHIP DATE: 02DEC19
 ACTWGT: 1.00 LB MAN
 CAD: 300130/CAFE3211
 DIMS: 26x14x14 IN

TO CLIENT SERVICES
 ALS LABORATORY GROUP
 10450 STANCLIFF ROAD
 SUITE 210
 HOUSTON TX 77099

(281) 530-6656
 REF: LHAAP - 18/24 - BO 60900 - RJ

RMA: ||| ||| |||



FedEx
 TRK# 1251 0292 4184
 0221

FRI - 13 DEC 10:30A
 PRIORITY OVERNIGHT

AB SGRA

77099
 TX-US IAH



*475872 12/12 567J2/18DD/05A2



Case Narrative

Method: 6850
Analysis: Perchlorate
Analysis SOP: LC-MS-CLO4
ALS WO ID(s): 1935345; 1935347; 1935366

Client: ALS Laboratories (Houston, TX)
Matrix: Water
ELMS Batch (HBN): 2331 (254172)

General Set Information: There were eighteen field samples in these Work Orders. The samples were analyzed for perchlorate.

Method Summary: Each sample was prepared as noted below and analyzed using an Agilent 1100 LC/MSD system in select ion monitoring (SIM) mode at m/z 83 and 85, which corresponds to the loss of one oxygen atom from the perchlorate molecule. ChemStation software was used for instrument control and data analysis. The ion ratio of m/z 83 to 85 was used to positively identify the response peak as perchlorate. Quantitation was performed using the m/z 83 peak area. An internal standard (ISTD) of ^{18}O labeled perchlorate was added to each sample to establish the perchlorate peak retention time and used in quantitation.

Sample Preparation: A 10.0mL aliquot of each sample was transferred into a 15-mL centrifuge tube. 50 μL of an ^{18}O labeled perchlorate solution was added to each sample as an internal standard. The samples were then capped, vortexed, and filtered into autosampler vial using Phenex PES membrane 0.45 μm Syringe filters.

Holding Times: Holding times were met for all analyses.

Dilutions: Samples 1935345003/04 failed the 50-150% method requirement for ISTD recoveries. These samples were re-analyzed and reported at dilutions of 1:2 and 1:5, respectively. Field sample 1935347003 was analyzed and reported from a 1:10 dilution. Field samples 1935345006/10 were analyzed and reported from 1:100 dilutions. Field samples 1935345007 and 1935347001/02 were analyzed and reported from 1:1,000 dilutions. Field samples 1935345008/09 were analyzed and reported from 1:10,000 dilutions. The reporting limits have been adjusted accordingly.

Method QC data: The method blank (LMB 689525) was less than 1/2 the CRDL. The recovery for the LCS (689526) was within acceptable parameters.



MS/MSD Analysis: MS/MSD was performed on samples 1935347004/05 (Client ID: MW22_121119). 3.0 μ L of Working Standard Solution Horizon ID 49947 was added to 10.0mL of sample preparation. The spike target was 3. μ g/L. The MS/MSD failed QC acceptance criteria for percent recoveries. The relative percent difference (RPD) passed acceptance criteria. The Matrix Spike and Matrix Spike duplicate is reported for the clients' information only. The sample matrix may be inappropriate for the method selected.

Instrument QC: Instrument initial and continuing calibrations were performed in accordance with published procedures.

NC/CAR(s): NA

Sample Calculation: Samples were reported in μ g/L. Results were calculated in μ g/L by the equation $(A) \times (B)$,

where: A = Analyte concentration from the standard curve (μ g/L)
B = Dilution performed at time of analysis

Miscellaneous Comments: These samples were analyzed in accordance with the requirements found in the DOD QSM Version 5.1.1. The Reporting Limit Verification Standard (RLVS – 689523) is reported from the analysis of the Laboratory Control Sample (LCS – 689522) at a level of 3.0 μ g/L. Due to limitations of the Chemstation Software, some of the chromatographic peaks may require manual integrations. A manual integration was performed for one of the Initial Calibration analyses (datafile: 20SEPI03) along with datafiles 23DEC19D21/23.

Thomas Bosch December 30, 2019
Analyst Date



ANALYTICAL REPORT

Amended-20200103

Report Date: January 03, 2020

RJ Modashia
 ALS Environmental (Houston)
 10450 Stancliff Road
 Suite 210
 Houston, TX 77099

Phone: 281 530-5656

E-mail: RJ.Modashia@ALSGlobal.com

Workorder: **34-1935345**

Project ID: HS19120765

Purchase Order: HS19120765

Project Manager Kevin W. Griffiths

Client Sample ID	Lab ID	Collect Date	Receive Date	Sampling Site
18WW22_121219	1935345001	12/12/19	12/17/19	
18WW22_121219_a	1935345002	12/12/19	12/17/19	
C08_121219	1935345003	12/12/19	12/17/19	
18CPTMW24_121219	1935345004	12/12/19	12/17/19	
18CPTMW07_121219	1935345005	12/12/19	12/17/19	
109_121219	1935345006	12/12/19	12/17/19	
MW3_121219	1935345007	12/12/19	12/17/19	
MW23_121219	1935345008	12/12/19	12/17/19	
MW23_121219_a	1935345009	12/12/19	12/17/19	
125_121219	1935345010	12/12/19	12/17/19	

ADDRESS 960 West LeVoy Drive, Salt Lake City, Utah, 84123 USA | PHONE +1 801 266 7700 | FAX +1 801 268 9992

ALS GROUP USA, CORP. An ALS Limited Company

Environmental 

www.alsglobal.com

Page 61 of 181

RIGHT SOLUTIONS | RIGHT PARTNER



ANALYTICAL REPORT

Amended-20200103

Workorder: 34-1935345

Client: ALS Environmental
(Houston)

Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: 18WW22_121219	Sampling Site: NA	Collected: 12/12/2019				
Lab ID: 1935345001	Media: 125 mL Nalgene	Received: 12/17/2019				
Matrix: Water	Sampling Parameter: NA					
Analysis Method - EPA 6850, DoD QSM						
Preparation: Not Applicable	Analysis: EPA 6850, DoD QSM Water Batch: ELMS/2331 (HBN: 254172) Analyzed: 12/23/2019 09:07	Instrument ID: LCMS04 %Solids: NA Report Basis: Wet				
Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Sample ID: 18WW22_121219_a	Sampling Site: NA	Collected: 12/12/2019				
Lab ID: 1935345002	Media: 125 mL Nalgene	Received: 12/17/2019				
Matrix: Water	Sampling Parameter: NA					
Analysis Method - EPA 6850, DoD QSM						
Preparation: Not Applicable	Analysis: EPA 6850, DoD QSM Water Batch: ELMS/2331 (HBN: 254172) Analyzed: 12/23/2019 09:21	Instrument ID: LCMS04 %Solids: NA Report Basis: Wet				
Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Sample ID: C08_121219	Sampling Site: NA	Collected: 12/12/2019				
Lab ID: 1935345003	Media: 125 mL Nalgene	Received: 12/17/2019				
Matrix: Water	Sampling Parameter: NA					
Analysis Method - EPA 6850, DoD QSM						
Preparation: Not Applicable	Analysis: EPA 6850, DoD QSM Water Batch: ELMS/2331 (HBN: 254172) Analyzed: 12/23/2019 15:18	Instrument ID: LCMS04 %Solids: NA Report Basis: Wet				
Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	2.0	4.0	8.0	2	U

Sample ID: 18CPTMW24_121219	Sampling Site: NA	Collected: 12/12/2019				
Lab ID: 1935345004	Media: 125 mL Nalgene	Received: 12/17/2019				
Matrix: Water	Sampling Parameter: NA					
Analysis Method - EPA 6850, DoD QSM						
Preparation: Not Applicable	Analysis: EPA 6850, DoD QSM Water Batch: ELMS/2331 (HBN: 254172) Analyzed: 12/23/2019 13:45	Instrument ID: LCMS04 %Solids: NA Report Basis: Wet				
Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	11	5.0	10	20	5	J



ANALYTICAL REPORT

Amended-20200103

Workorder: 34-1935345

Client: ALS Environmental
(Houston)

Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: 18CPTMW07_121219	Sampling Site: NA	Collected: 12/12/2019				
Lab ID: 1935345005	Media: 125 mL Nalgene	Received: 12/17/2019				
Matrix: Water	Sampling Parameter: NA					
Analysis Method - EPA 6850, DoD QSM						
Preparation: Not Applicable	Analysis: EPA 6850, DoD QSM Water Batch: ELMS/2331 (HBN: 254172) Analyzed: 12/23/2019 10:02	Instrument ID: LCMS04 %Solids: NA Report Basis: Wet				
Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Sample ID: 109_121219	Sampling Site: NA	Collected: 12/12/2019				
Lab ID: 1935345006	Media: 125 mL Nalgene	Received: 12/17/2019				
Matrix: Water	Sampling Parameter: NA					
Analysis Method - EPA 6850, DoD QSM						
Preparation: Not Applicable	Analysis: EPA 6850, DoD QSM Water Batch: ELMS/2331 (HBN: 254172) Analyzed: 12/23/2019 10:16	Instrument ID: LCMS04 %Solids: NA Report Basis: Wet				
Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	1000	100	200	400	100	

Sample ID: MW3_121219	Sampling Site: NA	Collected: 12/12/2019				
Lab ID: 1935345007	Media: 125 mL Nalgene	Received: 12/17/2019				
Matrix: Water	Sampling Parameter: NA					
Analysis Method - EPA 6850, DoD QSM						
Preparation: Not Applicable	Analysis: EPA 6850, DoD QSM Water Batch: ELMS/2331 (HBN: 254172) Analyzed: 12/23/2019 10:30	Instrument ID: LCMS04 %Solids: NA Report Basis: Wet				
Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	15000	1000	2000	4000	1000	

Sample ID: MW23_121219	Sampling Site: NA	Collected: 12/12/2019				
Lab ID: 1935345008	Media: 125 mL Nalgene	Received: 12/17/2019				
Matrix: Water	Sampling Parameter: NA					
Analysis Method - EPA 6850, DoD QSM						
Preparation: Not Applicable	Analysis: EPA 6850, DoD QSM Water Batch: ELMS/2331 (HBN: 254172) Analyzed: 12/23/2019 10:44	Instrument ID: LCMS04 %Solids: NA Report Basis: Wet				
Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	73000	10000	20000	40000	10000	



ANALYTICAL REPORT

Amended-20200103

Workorder: 34-1935345

Client: ALS Environmental
(Houston)

Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: MW23_121219_a	Sampling Site: NA	Collected: 12/12/2019				
Lab ID: 1935345009	Media: 125 mL Nalgene	Received: 12/17/2019				
Matrix: Water	Sampling Parameter: NA					
Analysis Method - EPA 6850, DoD QSM						
Preparation: Not Applicable	Analysis: EPA 6850, DoD QSM Water Batch: ELMS/2331 (HBN: 254172) Analyzed: 12/23/2019 10:58	Instrument ID: LCMS04 %Solids: NA Report Basis: Wet				
Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	80000	10000	20000	40000	10000	

Sample ID: 125_121219	Sampling Site: NA	Collected: 12/12/2019				
Lab ID: 1935345010	Media: 125 mL Nalgene	Received: 12/17/2019				
Matrix: Water	Sampling Parameter: NA					
Analysis Method - EPA 6850, DoD QSM						
Preparation: Not Applicable	Analysis: EPA 6850, DoD QSM Water Batch: ELMS/2331 (HBN: 254172) Analyzed: 12/23/2019 11:12	Instrument ID: LCMS04 %Solids: NA Report Basis: Wet				
Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	1800	100	200	400	100	

Comments

Workorder: 1935345

Client requested sample IDs be changed for sample #1 and 2 to 18WW22, instead of 18MW22

Quality Control: EPA 6850, DoD QSM - (HBN: 254172)

Samples 1935345003/04 failed the 50-150% method requirement for ISTD recoveries. These samples were re-analyzed and reported at dilutions of 1:2 and 1:5, respectively. Field sample 1935347003 was analyzed and reported from a 1:10 dilution. Field samples 1935345006/10 were analyzed and reported from 1:100 dilutions. Field samples 1935345007 and 1935347001/02 were analyzed and reported from 1:1,000 dilutions. Field samples 1935345008/09 were analyzed and reported from 1:10,000 dilutions. The reporting limits have been adjusted accordingly.

Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Method	Analyst	Peer Review
EPA 6850, DoD QSM	/S/ Thomas Bosch 12/30/2019 12:07	/S/ Stephen Brose 12/30/2019 15:01

Laboratory Contact Information

ALS Environmental
960 W Levoy Drive
Salt Lake City, Utah 84123

Phone: (801) 266-7700
Email: als@alst.com
Web: www.alst.com



ANALYTICAL REPORT

Amended-20200103

Workorder: 34-1935345

Client: ALS Environmental
(Houston)

Project Manager: Kevin W. Griffiths

General Lab Comments

The results provided in this report relate only to the items tested.
 Samples were received in acceptable condition unless otherwise noted.
 Samples have not been blank corrected unless otherwise noted.
 This test report shall not be reproduced, except in full, without written approval of ALS.

ALS provides professional analytical services for all samples submitted. ALS is not in a position to interpret the data and assumes no responsibility for the quality of the samples submitted.

All quality control samples processed with the samples in this report yielded acceptable results unless otherwise noted.

ALS is accredited for specific fields of testing (scopes) in the following testing sectors. The quality system implemented at ALS conforms to accreditation requirements and is applied to all analytical testing performed by ALS. The following table lists testing sector, accreditation body, accreditation number and website. Please contact these accrediting bodies or your ALS project manager for the current scope of accreditation that applies to your analytical testing.

Testing Sector	Accreditation Body (Standard)	Certificate Number	Website
Environmental	PJLA (DoD ELAP)	L17-506	http://www.pjlab.com
	PJLA (ISO 17025)	L17-507-R1	http://www.pjlab.com
	Utah (TNI)	UT00953	http://lams.nelac-institute.org/search
	Iowa (TNI)	IA# 376	http://www.shl.uiowa.edu/labcert/idnr/
	Kansas	E-10416	http://www.kdheks.gov/envlab/disclaimer.html
Industrial Hygiene	AIHA (ISO 17025 & AIHA IHLAP)	101574	http://www.aihaaccreditedlabs.org
	DOECAP-AP	L18-606	http://www.pjlab.com
	Washington	C596	https://ecology.wa.gov/Regulations-Permits/Permits-certifications/Laboratory-Accreditation
Dietary Supplements	PJLA (ISO 17025)	L17-507-R1	http://www.pjlab.com

Result Symbol Definitions

MDL = Method Detection Limit, a statistical estimate of method/media/instrument sensitivity.

RL = Reporting Limit, a verified value of method/media/instrument sensitivity.

CRDL = Contract Required Detection Limit

Reg. Limit = Regulatory Limit.

ND = Not Detected, testing result not detected above the MDL or RL.

< Means this testing result is less than the numerical value.

** No result could be reported, see sample comments for details.

Qualifier Symbol Definitions

U = Qualifier indicates that the analyte was not detected above the MDL.

J = Qualifier Indicates that the analyte value is between the MDL and the RL. It is also used to indicate an estimated value for tentatively identified compounds in mass spectrometry where a 1:1 response is assumed.

B = Qualifier indicates that the analyte was detected in the blank.

E = Qualifier indicates that the analyte result exceeds calibration range.

P = Qualifier indicates that the RPD between the two columns is greater than 40%.



Quality Control Sample Batch Report

00958162

Analysis Information

Workorder: 1935345

Limits: Client SOW/Contract Specified
Basis: DoD QSM

Preparation: NA
Batch: NA
Prepared By: NA

Analysis: EPA 6850, DoD QSM
Batch: ELMS/2331 (HBN: 254172)
Analyzed By: Thomas Bosch

Blank

LMB: 689525 Analyzed: 12/23/2019 08:53 Units: ug/L			
Analyte	Result	MDL	RL
Perchlorate	ND	1	2.00

Laboratory Control Sample

LCS: 689522 Analyzed: 12/23/2019 08:25 Dilution: 1 Units: ug/L				
Analyte	Result	Target	% Rec	QC Limits
Perchlorate	3.20	3.00	107	78.8 123.8

Matrix Spike - Matrix Spike Duplicate

Sample: 1935347003 Analyzed: 12/23/2019 12:07 Dilution: 10 Units: ug/L		MS: 1935347004 Analyzed: 12/23/2019 14:45 Dilution: 10 Units: ug/L				MSD: 1935347005 Analyzed: 12/23/2019 14:59 Dilution: 10 Units: ug/L			
Analyte	Result	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits
Perchlorate	210	250	30	▲ 142	78.8 123.8	251	▲ 146	0.487	0.0 20.0

Comments

Samples 1935345003/04 failed the 50-150% method requirement for ISTD recoveries. These samples were re-analyzed and reported at dilutions of 1:2 and 1:5, respectively. Field sample 1935347003 was analyzed and reported from a 1:10 dilution. Field samples 1935345006/10 were analyzed and reported from 1:100 dilutions. Field samples 1935345007 and 1935347001/02 were analyzed and reported from 1:1,000 dilutions. Field samples 1935345008/09 were analyzed and reported from 1:10,000 dilutions. The reporting limits have been adjusted accordingly.

QC Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Analyst	Peer Review
/S/ Thomas Bosch 12/30/2019 12:39	/S/ Stephen Brose 12/30/2019 15:01

Symbols and Definitions

- * - Analyte above reporting limit or outside of control limits
- ▲ - Sample result is greater than 4 times the spike added
- - Sample and Matrix Duplicate less than 5 times the reporting limit
- - Result is above the calibration range
- # - The Matrix Spike, Matrix Spike duplicate or Matrix Duplicate is reported for your information only. The sample matrix may be inappropriate for the method selected.

- RPD - Relative % Difference (Spike / Spike Duplicate)
- ND - Not Detected (U - Qualifier also flags analyte as not detected)
- NA - Not Applicable
- QC results are not adjusted for moisture correction, where applicable



1935345

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

18698/#2

SAMPLING STATE: Texas

COC ID: 12861

SUBCONTRACT TO:

ALS Laboratory Group
960 LeVoy Dr
Salt Lake City, UT 84123

Phone: +1 801 266 7700

1935345

CUSTOMER INFORMATION:

Company: ALS Houston
Contact: RJ Modashia
Address: 10450 Stancliff Rd, Ste 210
Phone: +1 281 530 5656
Email: RJ.Modashia@alsglobal.com
Alternate Contact: Jumoke M. Lawal
Email: jumoke.lawal@alsglobal.com

INVOICE INFORMATION:

Company: ALS Houston
Contact: Accounts Payable
Address: 10450 Stancliff Rd, Ste 210
Phone: +1 281 530 5656
Reference: HS19120765
TSR: Danielle Winnings

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	HS19120765-01	MW22_121219	Groundwater	12 Dec 2019 08:05
	SUB_Perch-6850			23 Dec 2019
2.	HS19120765-02	MW22_121219_a	Groundwater	12 Dec 2019 08:05
	SUB_Perch-6850			23 Dec 2019
3.	HS19120765-03	C08_121219	Groundwater	12 Dec 2019 09:00
	SUB_Perch-6850			23 Dec 2019
4.	HS19120765-04	18CPTMW24_121219	Groundwater	12 Dec 2019 09:50
	SUB_Perch-6850			23 Dec 2019
5.	HS19120765-05	18CPTMW07_121219	Groundwater	12 Dec 2019 10:45
	SUB_Perch-6850			23 Dec 2019
6.	HS19120765-06	109_121219	Groundwater	12 Dec 2019 11:35
	SUB_Perch-6850			23 Dec 2019
7.	HS19120765-07	MW3_121219	Groundwater	12 Dec 2019 12:30
	SUB_Perch-6850			23 Dec 2019
8.	HS19120765-08	MW23_121219	Groundwater	12 Dec 2019 13:20
	SUB_Perch-6850			23 Dec 2019
9.	HS19120765-09	MW23_121219_a	Groundwater	12 Dec 2019 13:20

RIGHT SOLUTIONS | RIGHT PARTNER

14 Dec 2019

Page 1 of 2



Subcontract Chain of Custody

SAMPLING STATE: Texas

COC ID: 12861

LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
ANALYSIS REQUESTED			DUE DATE
SUB_Perch-6850			23 Dec 2019
10. HS19120765-10	125_121219	Groundwater	12 Dec 2019 13:40
SUB_Perch-6850			23 Dec 2019

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

QC Level: DOD IV (DoD Data Package)

Relinquished By: _____

Date/Time: _____

Received By: _____

Date/Time: _____

Cooler ID(s): _____

Temperature(s): _____

14 Dec 2019

Page 2 of 2

Kevin Griffiths

From: RJ Modashia
Sent: Thursday, January 02, 2020 10:23 AM
To: Kevin Griffiths
Cc: Jumoke Lawal
Subject: FW: [EXTERNAL] - HS19120765; 1935345
Attachments: HS19120765 ALS Salt Lake City 1935345-Combined Report.pdf

Hi Kevin,

Could you please revise this report to update the sample IDs for sample #1 and 2 to 18WW22, instead of 18MW22

Thanks,

RJ Modashia
 Project Manager, Environmental
 Houston



T +1 281 530 5656 **D** +1 281 575 2279

F +1 281 530 5887

rj.modashia@alsglobal.com

10450 Stancliff Road, Suite 210
 Houston, TX 77099

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alsglobal.com | **How was your ALS experience?**

From: Marcia Olive [mailto:molive@bhate.com]
Sent: Thursday, January 02, 2020 10:54 AM
To: RJ Modashia <RJ.Modashia@ALSGlobal.com>
Subject: [EXTERNAL] - HS19120765

CAUTION: This email originated from outside of ALS. Do not click links or open attachments unless you recognize the sender and are sure content is relevant to you.

Hi RJ,
 Happy New Year!
 Could you revise this package so that the sample IDs for #1 and 2 are "18WW22" instead of "18MW22"?

ALS-SALT LAKE CITY-RELATED INFORMATION REPORT (CRIR)

COOLER OR CONTAINER INFORMATION CHECKLIST (Fill In or Circle)

Client Name: ALS Houston Project/Task/Site: _____
 Date/Time of Receipt: 12/17/19 9:00 Number of Coolers Received: 1 1935345

Condition of Coolers: <u>Acceptable/Unacceptable</u>	Temperature Control: <u>Present/Not Included</u>																								
Cooler Custody Seals: <u>Present/Absent/NA</u>	Location Temp Taken: <u>Control/Between Samples</u>																								
Container Custody Seals: <u>Present/Absent/NA</u>	Are all temperatures within project specific guidelines? <u>Yes/No/NA</u>																								
Ice Present: <u>Yes/No/NA</u>	VOA Headspace Present? <u>Yes/No/NA</u>																								
pH Check Performed: <table border="1"> <tr> <td>Metals</td> <td>Yes/No/NA</td> <td>Total Phenolics</td> <td>Yes/No/NA</td> <td>NO3/NO2</td> <td>Yes/No/NA</td> </tr> <tr> <td>Cyanide</td> <td>Yes/No/NA</td> <td>TPH - 418.1</td> <td>Yes/No/NA</td> <td>Oil & Grease</td> <td>Yes/No/NA</td> </tr> <tr> <td>Sulfide</td> <td>Yes/No/NA</td> <td>COD</td> <td>Yes/No/NA</td> <td>Total Phosphorous</td> <td>Yes/No/NA</td> </tr> <tr> <td>Ammonia</td> <td>Yes/No/NA</td> <td>TKN</td> <td>Yes/No/NA</td> <td>Gross A.B, Gamma Spec</td> <td>Yes/No/NA</td> </tr> </table>	Metals	Yes/No/NA	Total Phenolics	Yes/No/NA	NO3/NO2	Yes/No/NA	Cyanide	Yes/No/NA	TPH - 418.1	Yes/No/NA	Oil & Grease	Yes/No/NA	Sulfide	Yes/No/NA	COD	Yes/No/NA	Total Phosphorous	Yes/No/NA	Ammonia	Yes/No/NA	TKN	Yes/No/NA	Gross A.B, Gamma Spec	Yes/No/NA	
Metals	Yes/No/NA	Total Phenolics	Yes/No/NA	NO3/NO2	Yes/No/NA																				
Cyanide	Yes/No/NA	TPH - 418.1	Yes/No/NA	Oil & Grease	Yes/No/NA																				
Sulfide	Yes/No/NA	COD	Yes/No/NA	Total Phosphorous	Yes/No/NA																				
Ammonia	Yes/No/NA	TKN	Yes/No/NA	Gross A.B, Gamma Spec	Yes/No/NA																				

Cooler Received	Cooler Condition	Temp.	Cooler Received	Cooler Condition	Temp.	Cooler Received	Cooler Condition	Temp.
1	<u>good</u>	<u>2</u> °C	4		°C	7		°C
2		°C	5		°C	8		°C
3		°C			°C	9		°C

Taken By: [Signature] [Signature] [Signature]
Signature Signature Signature
 Printed Name: Meredith Edmunds Date: 12/17/19

CLIENT-RELATED INFORMATION

<input type="checkbox"/> Missing Cooler	<input type="checkbox"/> Missing Samples/Bottles	<input type="checkbox"/> Incorrect Preservation	<input type="checkbox"/> Insufficient Sample Volume
<input type="checkbox"/> Cooler Conditions	<input type="checkbox"/> Broken/Leaking Samples	<input type="checkbox"/> pH Criteria Not Met	<input type="checkbox"/> Chain of Custody Problems
<input type="checkbox"/> Missing Paperwork	<input type="checkbox"/> Incorrect Bottle Type	<input type="checkbox"/> Residual Chlorine Present	<input type="checkbox"/> Other:
<input type="checkbox"/> Missing/Incorrect Bottle Labels	<input type="checkbox"/> Cooler Temperatures Out of Range	<input type="checkbox"/> Head Space in Bottles	

BRIEFLY DESCRIBE THE PROBLEM AND THE ACTION TAKEN:

Client Notified? YES NO

Response Required Within 24 Hours

PROJECT MANAGEMENT

PROJECT MANAGER COMMENTS:

ALS Project Manager: _____ Returned to Sample Receipt by: _____ Date: _____
Printed Name Signature

Must Deliver Next Business Day
Time and Temperature Sensitive!



ORIGIN ID: 8GRA (291) 530-5656
CLIENT SERVICES
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON, TX 77098
UNITED STATES US

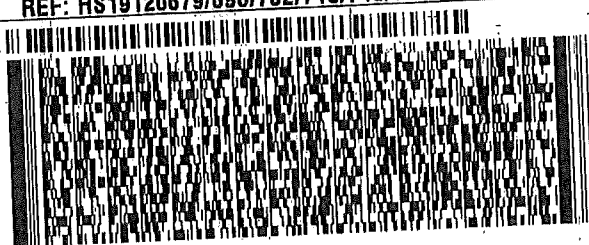
SHIP DATE: 16DEC19
ACTWGT: 47.30 LB
CAD: 300130/CAFE3211
DIMS: 26x14x14 IN
BILL THIRD PARTY

TO **SAMPLE RECEIVING
ALS ENVIRONMENTAL
960 W. LEVOY DRIVE**

SALT LAKE CITY UT 84123

(801) 266-7700

REF: HS19120679/696/702/715/745/765/843/844-



**FedEx
Express**



**TUE - 17 DEC 3:00P
STANDARD OVERNIGHT**

TRK# 1251 0292 9451
0201

AX BTFA

**84123
UT-US SLC**

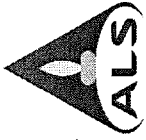




ALS Environmental
CHAIN-OF-CUSTODY

Project / Job / Task: HS19120765		Workorder ID: 1935345		Level: ENV_LVL4		Requested Analysis	
Client: ALS Environmental (Houston)		Account: 8101		Type: 125Poly		EPA 6950, D+D GSM	
Comments:				Preservatives			
				COOL			
				Containers			
Item	Collect Date/Time	Sample ID	Lab ID	QC	Matrix	ID(s)	Count
1	12/12/2019 08:05	MW22_121219	1935345001		Water	A	1
2	12/12/2019 08:05	MW22_121219_a	1935345002		Water	A	1
3	12/12/2019 09:00	C08_121219	1935345003		Water	A	1
4	12/12/2019 09:50	18CPTMW24_121219	1935345004		Water	A	1
5	12/12/2019 10:45	18CPTMW07_121219	1935345005		Water	A	1
6	12/12/2019 11:35	109_121219	1935345006		Water	A	1
7	12/12/2019 12:30	MW3_121219	1935345007		Water	A	1
8	12/12/2019 13:20	MW23_121219	1935345008		Water	A	1
9	12/12/2019 13:20	MW23_121219_a	1935345009		Water	A	1
10	12/12/2019 13:40	125_121219	1935345010		Water	A	1

ORIGINAL FIELD SAMPLE CHAIN-OF-CUSTODY				SAMPLE PREPARATION / ANALYSIS CHAIN-OF-CUSTODY			
Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location	Sample Prep / Analysis for:	Lab Notebook No.:	Prepared / Analyzed by:	Date / Time:
Warghur, Julie	12/17/2019 09:06	ALS Sample Receiving	Sample Login				
<i>John Warghur</i>	12/19/2019 1400	<i>ISD</i>	<i>stage</i>	Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location
<i>R.33.1</i>	12/21/19 12:00	<i>T.Booth</i>	<i>CLD analysis</i>				



Batch Worklist

HBN: 254172

Instrument:

Created: 12/23/2019 08:02



Status: WP

Analyst: T. Bosch

Batch: ELMS/2331

Rule: EPA 6850, DoD QSM Water

Workorder: 1935345 [ENV_LVL4]

Workorder: 1935347 [ENV_LVL4]

Workorder: 1935366 [ENV_LVL4]

Pos	Lab ID	Sample ID	Prep Initial	Prep Final	Dust Weight	Type	Mx	Container	Procedure	Mgr	Expire Date	Due Date	Run Date
1	689521	CCV for HBN 254172 [ELMS/2331]				CCV	3	E685041C3Q	E685041C3Q	5311		12/31/2019	
2	689522	LCS for HBN 254172 [ELMS/2331]				LCS	3	E6850Q413Q	E6850Q413Q	5311		12/31/2019	
3	689523	RLVS for HBN 254172 [ELMS/2331]				RLVS	3	E685041C3Q	E685041C3Q	5311		12/31/2019	
4	689524	ICS for HBN 254172 [ELMS/2331]				ICS	3	E6850_D3Q	E6850_D3Q	5311		12/31/2019	
5	689525	LMB for HBN 254172 [ELMS/2331]				LMB	3	E6850Q413Q	E6850Q413Q	5311		12/31/2019	
6	1935345001	MW22_121219				SAMPLE	3	1935345001-A	E6850Q41.3	5480	1/9/2020	12/31/2019	
7	1935345002	MW22_121219_a				SAMPLE	3	1935345002-A	E6850Q41.3	5480	1/9/2020	12/31/2019	
8	1935345003	C08_121219				SAMPLE	3	1935345003-A	E6850Q41.3	5480	1/9/2020	12/31/2019	
9	1935345004	18CPTMW24_121219				SAMPLE	3	1935345004-A	E6850Q41.3	5480	1/9/2020	12/31/2019	
10	1935345005	18CPTMW07_121219				SAMPLE	3	1935345005-A	E6850Q41.3	5480	1/9/2020	12/31/2019	
11	1935345006	109_121219				SAMPLE	3	1935345006-A	E6850Q41.3	5480	1/9/2020	12/31/2019	
12	1935345007	MW3_121219				SAMPLE	3	1935345007-A	E6850Q41.3	5480	1/9/2020	12/31/2019	
13	1935345008	MW23_121219				SAMPLE	3	1935345008-A	E6850Q41.3	5480	1/9/2020	12/31/2019	
14	689528	CCV for HBN 254172 [ELMS/2331]				CCV	3	E685041C3Q	E685041C3Q	5311		12/31/2019	
15	1935345009	MW23_121219_a				SAMPLE	3	1935345009-A	E6850Q41.3	5480	1/9/2020	12/31/2019	
16	1935345010	I25_121219				SAMPLE	3	1935345010-A	E6850Q41.3	5480	1/9/2020	12/31/2019	
17	1935347001	MW21_121119				SAMPLE	3	1935347001-A	E6850Q41.3	5480	1/8/2020	12/31/2019	
18	1935347002	MW21_121119_a				SAMPLE	3	1935347002-A	E6850Q41.3	5480	1/8/2020	12/31/2019	
19	1935347003	MW22_121119				SAMPLE	3	1935347003-A	E6850Q41.3	5480	1/8/2020	12/31/2019	
20	1935347004	MW22_121119MS				MS	3	1935347004-A	E6850Q413Q	5480		12/31/2019	
21	1935347005	MW22_121119MSD				MSD	3	1935347005-A	E6850Q413Q	5480		12/31/2019	
22	1935347006	18CPTMW06_121119				SAMPLE	3	1935347006-A	E6850Q41.3	5480	1/8/2020	12/31/2019	
23	1935347007	18CPTMW03SW_121119				SAMPLE	3	1935347007-A	E6850Q41.3	5480	1/8/2020	12/31/2019	
24	1935366001	LH18/24-SP650_121219_AIX				SAMPLE	3	1935366001-A	E6850Q41.3	5480	1/9/2020	12/31/2019	
25	689529	CCV for HBN 254172 [ELMS/2331]				CCV	3	E685041C3Q	E685041C3Q	5311		12/31/2019	
26	689664	CCV for HBN 254172 [ELMS/2331]				CCV	3	E685041C3Q	E685041C3Q	5311		12/31/2019	



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Analytical Documentation

Analyst Write-up

ALS Work Order #'s & Sample # ()'s: 1935345 (001-10); 1935347 (001-07); 1935366 (001)
 ELMS Batch/HBN ID: 2331 (254172)
 Prep Date: 12/21/2019 Analysis Date: 12/23/2019 Analyst: Tom Bosch
 Analyte: **Perchlorate** Matrix: **Water** Method: **6850**
 Sequence: \\HPCHEM\1\SEQUENCE\CLO4\2019\DEC\23DEC19D.s
 Reported DL: **1.0µg/L** Reported LOD: **2.0µg/L** Reported LOQ: **4.0µg/L**

SAMPLE PREPARATION/ANALYSIS:

Water: Samples were prepared by Tom Bosch. 10.0mL of each sample was pipetted into a 15-mL centrifuge tube, and 50µL of an oxygen-18 labeled perchlorate solution was added as an internal standard. The samples were capped, vortexed, and filtered with Phenex PES membrane 0.45µm Syringe filters prior to analysis.

REAGENTS: Eluent A1: 95% ASTM Type II water (ALS)/5%ACN (B&J Lot DU461-US)/0.1% glacial acetic acid (JT-Baker Lot 122550).
 Eluent B1: 95% ACN (B&J Lot DU461-US)/5% ASTM Type II water (ALS)/0.1% glacial acetic acid (JT-Baker Lot 122550).

STANDARDS: Internal Standard Spiking Solution Horizon# 47863. Dilutions of Working Standards (Horizon: 49947/48) used for ICAL, CCV's, RLVS and ICS.

CALIBRATION CURVE: Used curve from 09/20/2019, sequence 20SEP19D.s Offline Quantitation Method: CLO4-DP3.M

INSTRUMENT CONDITIONS: Samples were analyzed with an Agilent 1100 LC/MSD system, in negative SIM mode, monitoring m/z 83, 85, and 89.

Instrument ID: LCMS04 Online Acquisition Method: CLO4-AQN.M Fragmentor: 160 Output Gain: 8 Injection Volume: 35µL
 Column: KP-RPPX C8 separator, 250mm Mobile Phase: 70% Eluent A1; 30% Eluent B1 Run time: 12.0min.

FLOW GRADIENT:

Time (min.)	Flow (mL/min)
0	0.65
5.8	0.65
5.9	0.25
10.3	0.25
10.5	0.65
12.0	0.65

QC DATA: 3.0µL of QC Solution Horizon ID 47516 was used for LCS 689522; Target = 3.0µg/L. ASTM type II water was used for LMB 689525.

MS/MSD: The Matrix Spike and duplicate (MS/MSD) was performed on samples 1935347004/05 (Client ID's: MW22_121119). 3.0µl of Working Standard Solution Horizon ID 49947 was added to 10.0mL of sample preparation. Spike target = 3.0µg/L.

COMMENTS:

- 1) Results reported in µg/L. Samples 1935345003/04 failed the 50-150% method requirement for ISTD recoveries. These samples were re-analyzed and reported at dilutions of 1:2 and 1:5, respectively. Field sample 1935347003 was analyzed and reported from a 1:10 dilution. Field samples 1935345006/10 were analyzed and reported from 1:100 dilutions. Field samples 1935345007 and 1935347001/02 were analyzed and reported from 1:1,000 dilutions. Field samples 1935345008/09 were analyzed and reported from 1:10,000 dilutions. The reporting limits have been adjusted accordingly.
- 2) All QC, Blank, CCV, and MS/MSD results were within method parameters, except for the following. The MS/MSD failed QC acceptance criteria for percent recoveries. The relative percent difference (RPD) passed acceptance criteria. The Matrix Spike and Matrix Spike duplicate is reported for the clients' information only. The sample matrix may be inappropriate for the method selected.
- 3) Sample data can be viewed at two directories within the ALS system: \\ALSLTWS013\LCMS\LCMS04\2019\DEC\HBN# or through NuGenesis\Tree\PrintData\LCMS\DefaultView.
- 4) Notebook: \\alslts013\ORGANIC\BOSCH\LCMS\Perchlorates\Waters\2019\254172-DoD-ALS-Hstn LCMS4 or through \\ALSLTWS013\DATAREVIEW\HBN#
- 5) The Reporting Limit Verification Standard (RLVS – 689523) is reported from the analysis of the Laboratory Control Sample (LCS – 689522) at a level of 3.0µg/L.
- 6) Due to limitations of the Chemstation Software, some of the chromatographic peaks require manual integration. Manual Integrations were performed for one of the Initial Calibration analyses (datafile: 20SEP103) along with datafile 23DEC19D21/23.

5.5 Chromatography (GC, HPLC and LC/MS) Technical Review

Note: It is the peer reviewer's responsibility to ensure that appropriate criteria are used as defined in the HORIZON PROFILE. The evaluation criteria are prioritized as per Section 2.2 of this SOP. These items must be checked for all projects. The following checklist will be completed by both the analyst and the peer reviewer and scanned into the HBN folder with the raw data.

Chromatography (GC, HPLC, LC/MS) Technical Review Criteria	Analyst Initials	Reviewer Initials
Batch(es)/SDG: <u>ELMS: 2331 HBN: 254172</u>		
Sample Set IDs if Applicable: <u>1935345 1935347 1935366</u>		
Sample positions on autosampler verified against instrument sequence	TB	NA
Calibration standards analyzed and meets criteria	TB	SB
Standards traceability checked and meets criteria	TB	SB
Standard curve coefficients evaluated and meet criteria	TB	SB
ICVs analyzed and meet acceptance criteria	TB	SB
CCVs analyzed and meet acceptance criteria	TB	SB
Retention Time Windows checked	TB	SB
For method 8081A, Endrin/DDT Breakdown is checked for compliance	—	—
Surrogate recoveries checked and appropriately addressed	—	—
Method Preparation Blanks analyzed and meet acceptance criteria	TB	SB
MSs, MSDs, and/or MDs analyzed and calculations checked; applicable	TB	SB
RLVS analyzed	TB	SB
Preparation and analysis hold times met	TB	SB
Preparation deviations and re-preparations noted when performed	TB	SB
Analysis deviations and re-analyses noted when performed	TB	SB
Sample dilution factors noted on reports	TB	SB
Electronic records in HBN transcription accuracy and completeness	TB	SB
Preparation and analysis calculations checked	TB	SB
NCRs are completed as necessary NC/CAR# _____	TB	SB
Report forms are complete and accurate	TB	SB
Manual integrations checked	TB	SB



STANDARD REPORT

Working Standard - CLO4ISTDWRK

CLO4ISTDWRK		Description - Perchlorate ISTD Wrk 1,000ug/L			
Standard: 49946		Created By: Thomas Bosch		Amount: 25 mL	
MFG: ALS/SLC		Create Date: 09/23/2019 03:09PM		Expires: 09/19/2020	
MFG Lot: TNB: 09/20/2019		Verified By: Thomas Bosch		Usable: Yes	
Pipette ID: Not Provided		Verify Date:		Lab Lot: CLO4ISTDWRK	
Pos.	Analyte	Name	Concentration		
1	14797-73-0-8385	Perchlorate 83:85 Ratio	1000 ug/L		
2	14797-73-0-89	Perchlorate 89	1000 ug/L		
Composition					
Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
47863	CLO4ISTDSTK	Perchlorate ISTD Stock	CLO4ISTDSTK	0.25 mL	12/05/2028



STANDARD REPORT

Constituent

Stock Standard - CLO4ISTDSTK

CLO4ISTDSTK		Description - Perchlorate ISTD Stock	
Standard: 47863	Created By: Thomas Bosch	Amount: 1 mL	
MFG: Cambridge Isotope	Create Date: 05/23/2019 10:05AM	Expires: 12/05/2028	
MFG Lot: SDIH-016	Verified By: Thomas Bosch	Usable: Yes	
Part ID: OLM-7310-S	Verify Date:	Lab Lot: CLO4ISTDSTK	
Pos.	Analyte	Name	Concentration
1	14797-73-0-8385	Perchlorate 83:85 Ratio	100 ug/mL
2	14797-73-0-89	Perchlorate 89	100 ug/mL



STANDARD REPORT

Working Standard - CLO4 WRK

CLO4 WRK		Description - 6850 WKG Std 100.ug/L			
Standard: 49948		Created By: Thomas Bosch		Amount: 10 mL	
MFG: ALS/SLC		Create Date: 09/20/2019 03:09PM		Expires: 07/25/2020	
MFG Lot: TNB: 09/20/2019				Usable: Yes	
Pipette ID: Not Provided				Lab Lot: CLO4 WRK	
Pos.	Analyte	Name	Concentration		
1	14797-73-0	Perchlorate	0.1 ug/mL		
2	14797-73-0-8385	Perchlorate 83:85 Ratio	0.1 ug/mL		
Composition					
Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
49947	CLO4 INT	6850 Intermdt AccStd 10.ug/mL	CLO4 INT	0.1 mL	07/25/2020



STANDARD REPORT

Constituent

Stock Standard - CLO4 STOCK

CLO4 STOCK		Description - 6850 Stock AccStd 1,000ug/mL	
Standard: 43659		Created By: Thomas Bosch	Amount: 100 mL
MFG: AccuStandard		Create Date: 09/17/2018 09:09AM	Expires: 07/25/2020
MFG Lot: 218065075			Usable: Yes
Part ID: IC-PER-10X-1			Lab Lot: CLO4 STOCK
Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	1000 ug/mL
2	14797-73-0-8385	Perchlorate 83:85 Ratio	1000 ug/mL



STANDARD REPORT

Constituent

Solvent Standard - ASTM H2O

ASTM H2O		Description - ASTM Type II Water	
Standard: 109	Created By: ALS Support (Lims)	Amount: 1000 L	
MFG: DCL In House	Create Date: 10/06/2005 09:10AM	Expires: 11/07/2025	
MFG Lot: Not Provided		Usable: Yes	
Part ID: Not Provided		Lab Lot: LAB 109	
Pos.	Analyte	Name	Concentration
Solvent - Analyte(s) not applicable			



STANDARD REPORT

Constituent

Working Standard - CLO4 INT

CLO4 INT		Description - 6850 Intermdt AccStd 10.ug/mL			
Standard: 49947		Created By: Thomas Bosch		Amount: 10 mL	
MFG: ALS/SLC		Create Date: 09/23/2019 03:09PM		Expires: 07/25/2020	
MFG Lot: TNB: 09/20/2019				Usable: Yes	
Pipette ID: Not Provided				Lab Lot: CLO4 INT	
Pos.	Analyte	Name	Concentration		
1	14797-73-0	Perchlorate	10 ug/mL		
2	14797-73-0-8385	Perchlorate 83:85 Ratio	10 ug/mL		
Composition					
Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
43659	CLO4 STOCK	6850 Stock AccStd 1,000ug/mL	CLO4 STOCK	0.1 mL	07/25/2020



STANDARD REPORT

Working Standard - CLO4 QC WRK

CLO4 QC WRK		Description - 6850 QC WKG STD 100ug/L			
Standard: 47516		Created By: Thomas Bosch		Amount: 10 mL	
MFG: ALS/SLC		Create Date: 05/06/2019 03:05PM		Expires: 03/31/2020	
MFG Lot: TNB: 05/06/2019				Usable: Yes	
Pipette ID: Not Provided				Lab Lot: CLO4 QC WRK 100.ug/L	
Pos.	Analyte	Name	Concentration		
1	14797-73-0	Perchlorate	100 ug/L		
Composition					
Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
47515	CLO4 QC INT	6850 QC Intrmdt Std-QC 10ug/mL	CLO4 QC INT 10.ug/mL	0.1 mL	03/31/2020



STANDARD REPORT

Constituent

Solvent Standard - ASTM H2O

ASTM H2O		Description - ASTM Type II Water	
Standard: 109	Created By: ALS Support (Lims)	Amount: 1000 L	
MFG: DCL In House	Create Date: 10/06/2005 09:10AM	Expires: 11/07/2025	
MFG Lot: Not Provided		Usable: Yes	
Part ID: Not Provided		Lab Lot: LAB 109	
Pos.	Analyte	Name	Concentration
Solvent - Analyte(s) not applicable			



STANDARD REPORT

Constituent

Stock Standard - CLO4 QCSTOCK

CLO4 QCSTOCK		Description - 6850 QC Stock STD 1,000ug/mL	
Standard: 36748	Created By: Thomas Bosch	Amount: 100 mL	
MFG: Ultra Scientific	Create Date: 05/11/2017 01:05PM	Expires: 03/31/2020	
MFG Lot: CP-0860		Usable: Yes	
Part ID: ICC-013		Lab Lot: CLO4 QC STOCK	
Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	1000 ug/mL



STANDARD REPORT

Constituent

Working Standard - CLO4 QC INT

CLO4 QC INT		Description - 6850 QC Intrmdt Std-QC 10ug/mL			
Standard: 47515		Created By: Thomas Bosch		Amount: 10 mL	
MFG: ALS/SLC		Create Date: 05/06/2019 03:05PM		Expires: 03/31/2020	
MFG Lot: TNB: 05/06/2019				Usable: Yes	
Pipette ID: Not Provided				Lab Lot: CLO4 QC INT 10.ug/mL	
Pos.	Analyte	Name		Concentration	
1	14797-73-0	Perchlorate		10 ug/mL	
Composition					
Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
36748	CLO4 QCSTOCK	6850 QC Stock STD 1,000ug/mL	CLO4 QC STOCK	0.1 mL	03/31/2020

125 Market Street
New Haven, CT 06513
USA



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Fax (203)786-5287
www.AccuStandard.com

CERTIFICATE OF ANALYSIS



S 43659

AccuTrace™ Reference Standard

Catalog No: IC-PER-10X-1
Description: Perchlorate Standard
Element: Perchlorate (ClO₄)
SRM: Ind. Std.
Lot: 218065075

Matrix: Water

Hazards: Refer to SDS for complete safety information

Date Certified: Jun 25, 2018

Expiration: Jul 25, 2020

Sample Size: 100 mL

Components: 1

Storage Condition: Ambient (>5 °C)

Included on ISO/IEC 17025 Scope of Accreditation: Yes

Included on ISO 17034 Scope of Accreditation: Yes



Signal Word: None

Component	SRM #	Prepared Concentration (µg/mL)
ClO ₄ Perchlorate	Ind. Std.	1000

The gravimetric uncertainty for this product is ±0.24%.

The final solution was checked against an independent standard to verify its concentration.

We use the highest purity raw materials available to minimize impurity levels in the final solution. Typically 99.999%+ pure starting materials are used as well as ASTM Type I 18 megohm deionized water.

All solutions are filtered through a 0.2 µm filter prior to being bottled.

All glassware used in preparation is Class A and calibrated regularly.

All weights are traceable through NIST; Test No. 822-275872-11

All bottles are triple rinsed with deionized water prior to use.

Shake bottle prior to use and do not pipette directly out of the bottle. Use only cleaned Class A volumetric glassware.

We certify the accuracy of this standard to be ±0.5% of the stated value until its expiration date provided it is kept tightly capped and stored under the conditions stated above.

Certified By:

Meigan O'Leary, Inorganic QC Manager

Page 1 of 1

For use in routine laboratory analysis.

AccuStandard is accredited to ISO 17034, ISO/IEC 17025 and certified to ISO 9001:2015

QR-ORG/INO-001
Rev. 5/18



Certificate of Analysis



ISO Guide 34 Reference Material

Product Number: ICC-013
Lot Number: CP-0860



Lot Issue Date: 29-Feb 2016
Expiration Date: 31-Mar 2020

Product Name: Perchlorate IC Standard

Description:

This Reference Material (RM) was gravimetrically prepared in accordance with ISO Guide 34 and under ULTRA Scientific's ISO 9001 registered quality system. The neat materials used for this product have been verified by ULTRA's ISO 17025 laboratory and under ULTRA's ISO Guide 34 accreditation. The analyte concentrations were verified by ULTRA's ISO 17025 accredited laboratory. For each analyte, the true value, with its uncertainty value calculated at the 95% confidence level, is reported below.

Analyte	Starting Material	Lot Number	Purity (%)	Calculated Value	True Value	Traceability & Method
perchlorate	potassium perchlorate	RM07987	100	1001 ± 5 µg/mL	976 ± 6 µg/mL	NIST SRM 3141A; ICP-OES

Solvent: water (low TOC, < 50 ppb)

Storage: Store at Room Temperature (15° to 30°C).

Traceability:

Traceability has been established through an unbroken chain of comparisons, each having stated uncertainties. Comparisons are based on appropriate physical or chemical measurements, including gravimetric or volumetric dilution, where the mass or volume of a solution before and after dilution is measured. The balances used for these measurements are calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1, ISO 9001, ISO 17025, and ISO Guide 34. Calibrated Class A glassware is used for volumetric measurements. Thermometers are calibrated against a NIST traceable thermometer in accordance with NIST Special Publication 819.

Estimation of Uncertainties:

The true value is reported, with its uncertainty value calculated at the 95% confidence level.

Homogeneity:

This RM was formulated and unitized according to an in-house procedure and is guaranteed to be homogeneous. There is no minimum sub-sample size required.

Intended Use:

This RM is intended for the preparation of working reference samples for use in routine laboratory analyses, calibration of instruments, validation of analytical methods, assessments of measurement methods and continuing calibration verification.

Instructions for Use:

Sample aliquots for analysis should be withdrawn at 20°C to 25°C immediately after opening and should be processed without delay for the true value to be valid within the stated uncertainties. Do not pipet from the bottle. Do not return any material removed for pipetting to the bottle. Tightly cap the bottle after removing any material and store according to the instructions noted above.

Hazards:

Refer to the Safety Data Sheet for information regarding this RM.

Expiration of Certification:

The certification of this RM is valid, within the measurement uncertainty specified, until the expiration date specified above, provided the RM is handled and stored in accordance with the instructions given in this certificate. This certification is nullified if the RM is damaged, contaminated, or otherwise modified.

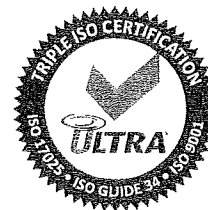


ISO 9001 Registered Quality System – TUV USA

Page 1 of 2



Certificate of Analysis



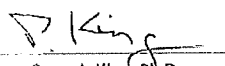
ISO Guide 34 Reference Material

Product Number: ICC-013
 Lot Number: CP-0860

Lot Issue Date: 29-Feb 2016
 Expiration Date: 31-Mar 2020

Maintenance of Certification:

The real-time, long term stability of the RM may be monitored over the lifetime of the certification. If substantive changes occur that affect the certification before the expiration of this certificate, ULTRA Scientific will notify the purchaser.


 Peter A. King, Ph.D.
 VP, Technical Operations


 Daniel J. Lamendola
 Director of QA/RA



ISO 9001 Registered Quality System – TUV USA

Page 2 of 2



Cambridge Isotope Laboratories, Inc.

Certificate of Analysis



Product Name: PERCHLORIC ACID, SODIUM SALT
(Isotopic Label & Enrichment Specification) (18O4, 90%+) 100 UG/ML IN WATER

Lot Number: SDIH-016

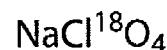
Catalog Number: OLM-7310-S

Product Information

Chemical Purity Specification: $\geq 98\%$

MW*: 130.44
* For isotopically labeled compounds, MW listed is for the fully enriched product.

Labeled CAS Number: NA



Unlabeled CAS Number: 7601-89-0

Chemical Formula: NaCl*O4

Storage: Store at room temperature away from light and moisture.

Stability: See storage and expiration date.

Certification

Cambridge Isotope Laboratories, Inc. guarantees that this material meets or exceeds the specifications stated. Absolute identity as well as chemical and isotopic purities are assured by the use of unambiguous synthetic routes and multiple chemical analyses whenever possible. Results are representative of QC testing at time of release from Quality Control unless otherwise stated. CIL Certificates of Analysis are occasionally updated with new data following recertification. We recommend checking the website for the latest version.

Volumetric measurements were made with Class A glassware. Gravimetry is traceable to the NIST through calibrated balances and certified, calibrated, standard weights. The calibrations are traceable to the NIST under Test No. 822/270236-04. The calibrations also meet specifications outlined in ISO 9001, ISO/IEC 17025, ANSI/NSCL Z540-1-1994, NCR Document 10CFR50 Appendix B, and applicable subdocuments.

This COA references the bulk catalog number before packaging. The COA also applies to the CIL finished good catalog number. Some possible packaging sizes and their corresponding suffix are -1.2, -1, -0.5, -10, or -0.1.

Approved by: Sashi Sivendran-Basak

Sashi Sivendran-Basak, Ph.D., Quality Review

Quality Control Tests and Results

QC Release Date	12/05/2018
Expiration Date	12/05/2028
Concentration Based on Gravimetry	100.0 \pm 1.0 $\mu\text{g/mL}$ (k=2)
Chemical Purity of Neat Material(s)	98%
LC/MS for Concentration	105.4 \pm 1.1 $\mu\text{g/mL}$ (k=2)



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Batch Review Method:

C:\HPCHEM\1\METHODS\CLO4-DP3.M

['#' ==> Run has not been reprocessed with Batch Review Method
 '*' ==> Run has been saved with batch file]

#*	Sample	Location	Inj	SampleType	Run	Perchlorate Area	Perchlorat RT	Perchlorate Amount	
#*	689521	CCV@25	Vial 71	1	Control	1	1.76473e6	7.347	27.49761
#*	689522	QC@3.0	Vial 72	1	Control	2	1.95559e5	7.165	3.20494
#*	689524	ICS@3.0	Vial 73	1	Control	3	1.44963e5	7.209	3.09759
#*	689525	LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
#*	1935345001		Vial 75	1	Sample	5	0.00000	0.000	0.00000
#*	1935345002		Vial 76	1	Sample	6	0.00000	0.000	0.00000
#*	1935345003		Vial 77	1	Sample	7	0.00000	0.000	0.00000
#*	1935345004		Vial 78	1	Sample	8	8.68794e4	6.933	4.62865
#*	1935345005		Vial 79	1	Sample	9	0.00000	0.000	0.00000
#*	1935345006	100	Vial 80	1	Sample	10	6.85819e5	7.544	1037.77002
#*	1935345007	1K	Vial 81	1	Sample	11	8.48401e5	7.592	1.49867e4
#*	1935345008	10K	Vial 82	1	Sample	12	5.01021e5	7.605	7.31745e4
#*	1935345009	10K	Vial 83	1	Sample	13	4.88880e5	7.614	7.95989e4
#*	1935345010	100	Vial 84	1	Sample	14	1.07600e6	7.601	1802.14414
#*	689414	CCV@25	Vial 71	1	Control	15	1.91095e6	7.461	26.99793
#*	1935347001	1K	Vial 85	1	Sample	16	8.33844e5	7.559	1.27519e4
#*	1935347002	1K	Vial 86	1	Sample	17	9.01055e5	7.560	1.32403e4
#*	1935347003	10X	Vial 87	1	Sample	18	1.33576e6	7.434	207.38479
#*	1935347006		Vial 90	1	Sample	21	3.37508e4	7.329	5.41444e-1 <RL
#*	1935347007		Vial 91	1	Sample	22	5.21433e5	7.284	9.08369
#*	1935366001		Vial 92	1	Sample	23	3.55813e4	7.225	5.16725e-1 <RL
#*	1935345003	5X	Vial 93	1	Sample	24	0.00000	0.000	0.00000
#*	1935345004	5X	Vial 94	1	Sample	25	1.12395e5	7.263	10.79582
#*	689415	CCV@25	Vial 71	1	Control	26	1.67312e6	7.458	25.55981
#*	1935347004	MS	Vial 97	1	Sample	29	1.64083e6	7.401	249.90057
#*	1935347005	MSD	Vial 98	1	Sample	30	1.58965e6	7.448	251.12094
#*	1935345003	2X	Vial 99	1	Sample	31	0.00000	0.000	0.00000 ✓
#*	1935345004	2X	Vial 100	1	Sample	32	9.76137e4	7.136	5.83827-N.R.
*	689664	CCV@25	Vial 71	1	Control	33	1.57878e6	7.452	26.31908

12-30-19
 TNB
 12-30-19

N.R. NOT REPORTED/SAMPLE FAILS 83/85 RATIO AT 2x DIL'N

#*	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount	
#*	689521	CCV@25	Vial 71	1	Control	1	2.17048e5	7.361	5.00000
#*	689522	QC@3.0	Vial 72	1	Control	2	2.24689e5	7.181	5.00000
#*	689524	ICS@3.0	Vial 73	1	Control	3	1.72263e5	7.224	5.00000
#*	689525	LMB	Vial 74	1	Control	4	2.13087e5	7.315	5.00000
#*	1935345001		Vial 75	1	Sample	5	2.38355e5	7.341	5.00000
#*	1935345002		Vial 76	1	Sample	6	2.83691e5	7.337	5.00000
#*	1935345003		Vial 77	1	Sample	7	8.98345e4	7.060	5.00000
#*	1935345004		Vial 78	1	Sample	8	6.92035e4	6.968	5.00000
#*	1935345005		Vial 79	1	Sample	9	1.93530e5	7.330	5.00000
#*	1935345006	100	Vial 80	1	Sample	10	2.39667e5	7.568	500.00000
#*	1935345007	1K	Vial 81	1	Sample	11	2.01594e5	7.615	5000.00000
#*	1935345008	10K	Vial 82	1	Sample	12	2.50964e5	7.629	5.00000e4
#*	1935345009	10K	Vial 83	1	Sample	13	2.24661e5	7.632	5.00000e4
#*	1935345010	100	Vial 84	1	Sample	14	2.09987e5	7.626	500.00000
#*	689414	CCV@25	Vial 71	1	Control	15	2.39873e5	7.482	5.00000
#*	1935347001	1K	Vial 85	1	Sample	16	2.34965e5	7.574	5000.00000
#*	1935347002	1K	Vial 86	1	Sample	17	2.44063e5	7.574	5000.00000
#*	1935347003	10X	Vial 87	1	Sample	18	2.23994e5	7.454	50.00000
#*	1935347006		Vial 90	1	Sample	21	2.06441e5	7.338	5.00000
#*	1935347007		Vial 91	1	Sample	22	2.09169e5	7.305	5.00000
#*	1935366001		Vial 92	1	Sample	23	2.26617e5	7.284	5.00000
#*	1935345003	5X	Vial 93	1	Sample	24	1.80510e5	7.124	25.00000
#*	1935345004	5X	Vial 94	1	Sample	25	1.90269e5	7.289	25.00000
#*	689415	CCV@25	Vial 71	1	Control	26	2.23153e5	7.477	5.00000

#*	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount	
#*	1935347004	MS	Vial 97	1	Sample	29	2.24361e5	7.419	50.00000
#*	1935347005	MSD	Vial 98	1	Sample	30	2.16198e5	7.469	50.00000
#*	1935345003	2X	Vial 99	1	Sample	31	1.59557e5	7.169	10.00000
#*	1935345004	2X	Vial 100	1	Sample	32	1.22992e5	7.153	10.00000
*	689664	CCV@25	Vial 71	1	Control	33	2.03857e5	7.479	5.00000

#*	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount	
#*	689521	CCV@25	Vial 71	1	Control	1	5.21339e5	7.363	26.74056
#*	689522	QC@3.0	Vial 72	1	Control	2	6.37839e4	7.182	3.33823
#*	689524	ICS@3.0	Vial 73	1	Control	3	5.30412e4	7.216	3.63016
#*	689525	LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
#*	1935345001		Vial 75	1	Sample	5	0.00000	0.000	0.00000
#*	1935345002		Vial 76	1	Sample	6	0.00000	0.000	0.00000
#*	1935345003		Vial 77	1	Sample	7	0.00000	0.000	0.00000
#*	1935345004		Vial 78	1	Sample	8	4.19271e4	6.950	7.19033
#*	1935345005		Vial 79	1	Sample	9	0.00000	0.000	0.00000
#*	1935345006	100	Vial 80	1	Sample	10	2.00419e5	7.565	987.24143
#*	1935345007	1K	Vial 81	1	Sample	11	2.50754e5	7.612	1.44793e4
#*	1935345008	10K	Vial 82	1	Sample	12	1.44992e5	7.619	6.85893e4
#*	1935345009	10K	Vial 83	1	Sample	13	1.42326e5	7.621	7.51552e4
#*	1935345010	100	Vial 84	1	Sample	14	3.22493e5	7.617	1767.87343
#*	689414	CCV@25	Vial 71	1	Control	15	5.66704e5	7.478	26.34088
#*	1935347001	1K	Vial 85	1	Sample	16	2.43643e5	7.576	1.21619e4
#*	1935347002	1K	Vial 86	1	Sample	17	2.68208e5	7.574	1.28608e4
#*	1935347003	10X	Vial 87	1	Sample	18	3.97796e5	7.446	202.52947
#*	1935347006		Vial 90	1	Sample	21	1.30256e4	7.346	6.21224e-1
#*	1935347007		Vial 91	1	Sample	22	1.79359e5	7.298	10.11684
#*	1935366001		Vial 92	1	Sample	23	1.40576e4	7.237	6.07978e-1
#*	1935345003	5X	Vial 93	1	Sample	24	0.00000	0.000	0.00000
#*	1935345004	5X	Vial 94	1	Sample	25	4.28598e4	7.292	13.11553
#*	689415	CCV@25	Vial 71	1	Control	26	5.03085e5	7.471	25.23942
#*	1935347004	MS	Vial 97	1	Sample	29	4.75546e5	7.418	238.52283
#*	1935347005	MSD	Vial 98	1	Sample	30	4.64978e5	7.463	241.73838
#*	1935345003	2X	Vial 99	1	Sample	31	0.00000	0.000	0.00000
#*	1935345004	2X	Vial 100	1	Sample	32	4.40685e4	7.140	8.47992
*	689664	CCV@25	Vial 71	1	Control	33	4.78132e5	7.471	26.16731

*** End of Report ***

Sequence Table:

Method and Injection Info Part:

Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
====	=====	=====	=====	====	=====	=====	=====
1	Vial 71	689521	CCV@25	CLO4-AQN	1	Ctrl Samp	
2	Vial 72	689522	QC@3.0	CLO4-AQN	1	Ctrl Samp	
3	Vial 73	689524	ICS@3.0	CLO4-AQN	1	Ctrl Samp	
4	Vial 74	689525	LMB	CLO4-AQN	1	Ctrl Samp	
5	Vial 75	1935345001		CLO4-AQN	1	Sample	
6	Vial 76	1935345002		CLO4-AQN	1	Sample	
7	Vial 77	1935345003		CLO4-AQN	1	Sample	
8	Vial 78	1935345004		CLO4-AQN	1	Sample	
9	Vial 79	1935345005		CLO4-AQN	1	Sample	
10	Vial 80	1935345006	100	CLO4-AQN	1	Sample	
11	Vial 81	1935345007	1K	CLO4-AQN	1	Sample	
12	Vial 82	1935345008	10K	CLO4-AQN	1	Sample	
13	Vial 83	1935345009	10K	CLO4-AQN	1	Sample	
14	Vial 84	1935345010	100	CLO4-AQN	1	Sample	
15	Vial 71	689414	CCV@25	CLO4-AQN	1	Ctrl Samp	
16	Vial 85	1935347001	1K	CLO4-AQN	1	Sample	
17	Vial 86	1935347002	1K	CLO4-AQN	1	Sample	
18	Vial 87	1935347003	10X	CLO4-AQN	1	Sample	
19	Vial 88	1935347004	MS	CLO4-AQN	1	Sample	
20	Vial 89	1935347005	MSD	CLO4-AQN	1	Sample	
21	Vial 90	1935347006		CLO4-AQN	1	Sample	
22	Vial 91	1935347007		CLO4-AQN	1	Sample	
23	Vial 92	1935366001		CLO4-AQN	1	Sample	
24	Vial 93	1935345003	5X	CLO4-AQN	1	Sample	
25	Vial 94	1935345004	5X	CLO4-AQN	1	Sample	
26	Vial 71	689415	CCV@25	CLO4-AQN	1	Ctrl Samp	
27	Vial 95	1935347004	NoSpk	CLO4-AQN	1	Sample	
28	Vial 96	1935347005	NoSpk	CLO4-AQN	1	Sample	
29	Vial 97	1935347004	MS	CLO4-AQN	1	Sample	
30	Vial 98	1935347005	MSD	CLO4-AQN	1	Sample	
31	Vial 99	1935345003	2X	CLO4-AQN	1	Sample	
32	Vial 100	1935345004	2X	CLO4-AQN	1	Sample	
33	Vial 71	689664	CCV@25	CLO4-AQN	1	Ctrl Samp	

Data file: C:\HPCHEM\1\DATA\23DEC19D\23DECD01.D

Sample Name: 689521 CCV@25

Injection Date: 12/23/2019 08:09:10

Seq Line: 1

Sample Name: 689521 CCV@25

Location: Vial 71

Acq Operator: TNB

Inj. No.: 1

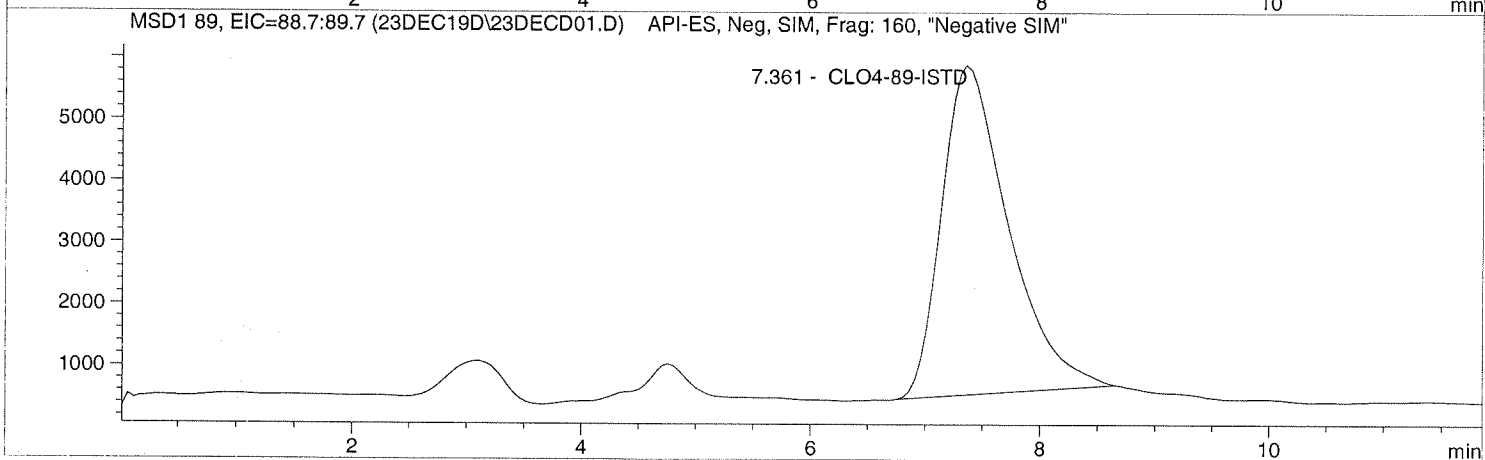
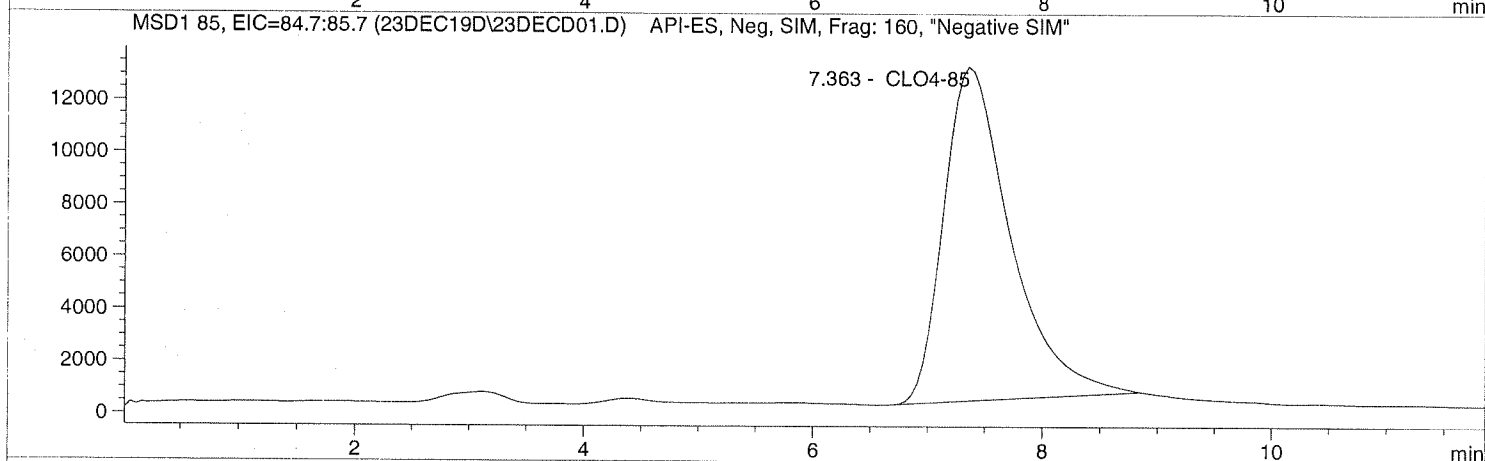
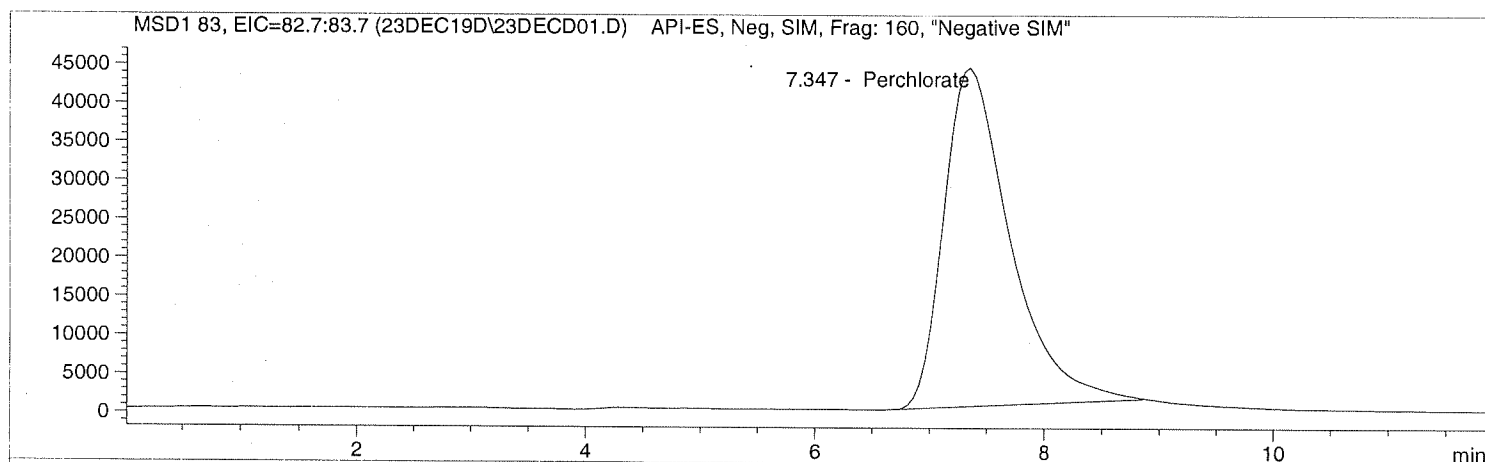
Inj. Vol.: 35 μ l

Acq. Method: CLO4-AQN.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M

Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23DEC19D\23DECD01.D Sample Name: 689521 CCV@25

```

=====
Injection Date: 12/23/2019 08:09:10      Seq Line: 1
Sample Name:    689521 CCV@25             Location:  Vial 71
Acq Operator:   TNB                       Inj. No.: 1
                                           Inj. Vol.: 35 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   11/5/2019 08:44:45
=====

```

Perchlorate analysis

Sample Information

```

=====
Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  25.000
=====

```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.347	PBA	1764733.7	27.4976	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.363	PBA	521339.0	26.7406	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.361	PBA	217048.4	5.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\23DEC19D\23DECD02.D

Sample Name: 689522 QC@3.0

Injection Date: 12/23/2019 08:25:30

Seq Line: 2

Sample Name: 689522 QC@3.0

Location: Vial 72

Acq Operator: TNB

Inj. No.: 1

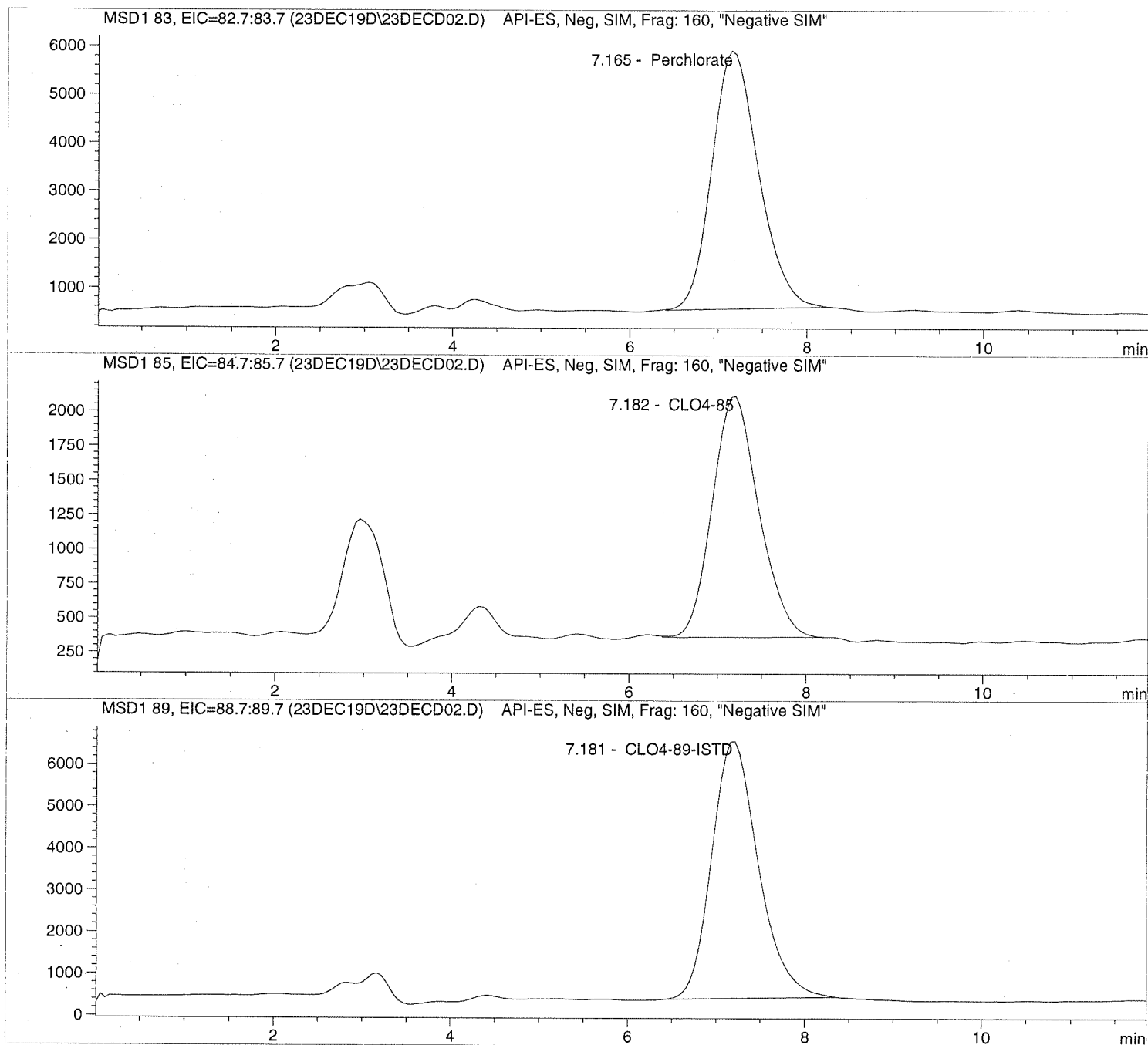
Inj. Vol.: 35 μ l

Acq. Method: CLO4-AQN.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M

Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23DEC19D\23DECD02.D Sample Name: 689522 QC@3.0

Injection Date: 12/23/2019 08:25:30 Seq Line: 2
 Sample Name: 689522 QC@3.0 Location: Vial 72
 Acq Operator: TNB Inj. No.: 1
 Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M
 Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
 Last Changed: 11/5/2019 08:44:45

Perchlorate analysis

Sample Information

Sorted By: Signal
 Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
 Multiplier: 1.000000
 Dilution: 1.000000
 Sample Amount: 3.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.165	BBA	195559.3	3.2049	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.182	BBA	63783.9	3.3382	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.181	BBA	224689.5	5.0000	CLO4-89-ISTD

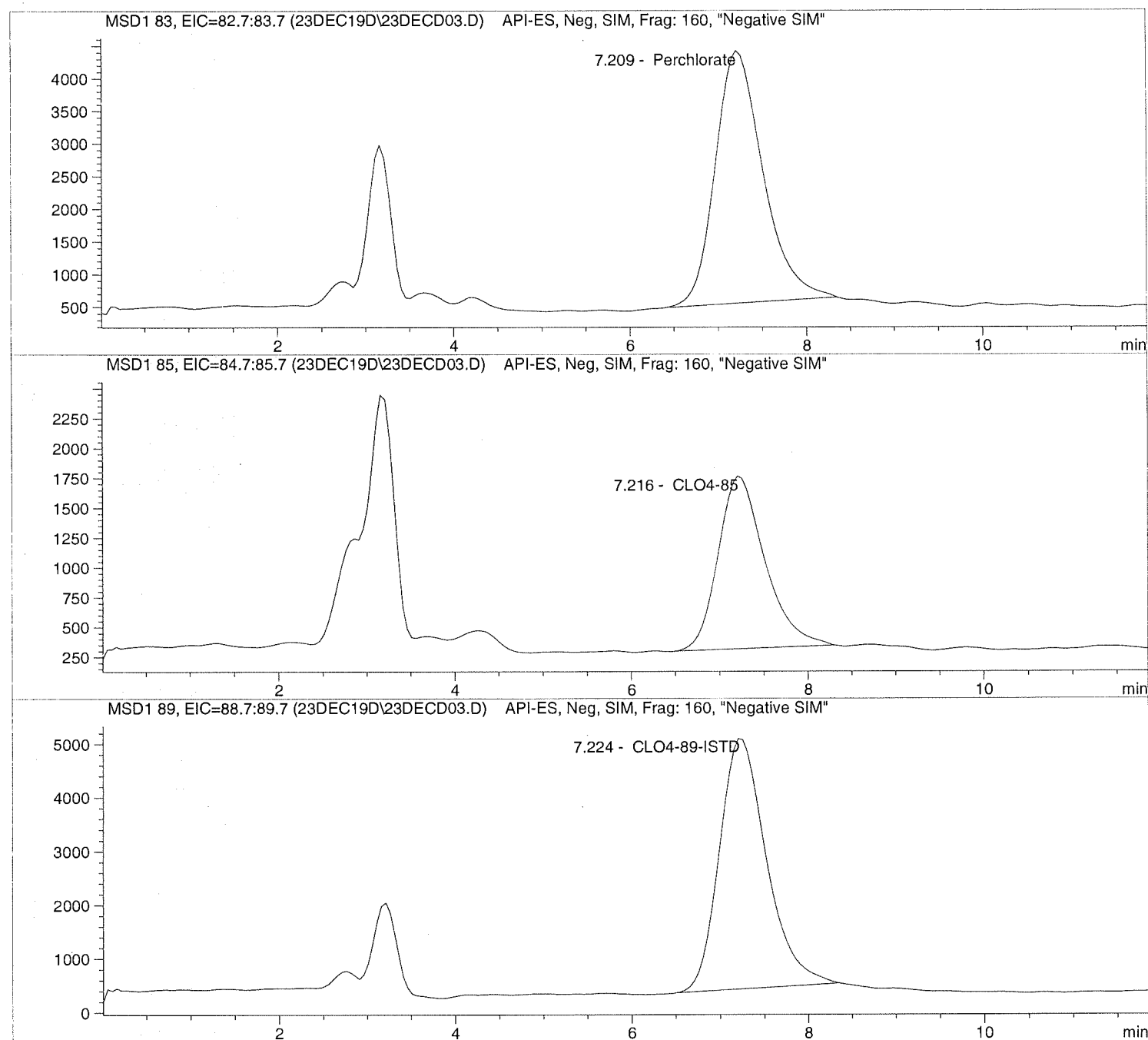
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\23DEC19D\23DECD03.D Sample Name: 689524 ICS@3.0

```
=====
Injection Date: 12/23/2019 08:39:24      Seq Line: 3
Sample Name: 689524 ICS@3.0              Location: Vial 73
Acq Operator: TNB                          Inj. No.: 1
                                           Inj. Vol.: 35 µl
=====
```

```
Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45
```

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23DEC19D\23DECD03.D Sample Name: 689524 ICS@3.0

```

=====
Injection Date: 12/23/2019 08:39:24      Seq Line:          3
Sample Name:   689524 ICS@3.0           Location:         Vial 73
Acq Operator:  TNB                      Inj. No.:        1
                                           Inj. Vol.:       35 µl

```

```

Acq. Method:   CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:  11/5/2019 08:44:45

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:    1.000000
Dilution:      1.000000
Sample Amount:  3.000

```

```

=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.209	BBA	144963.1	3.0976	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.216	PBA	53041.2	3.6302	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.224	PBA	172262.7	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\23DEC19D\23DECD04.D

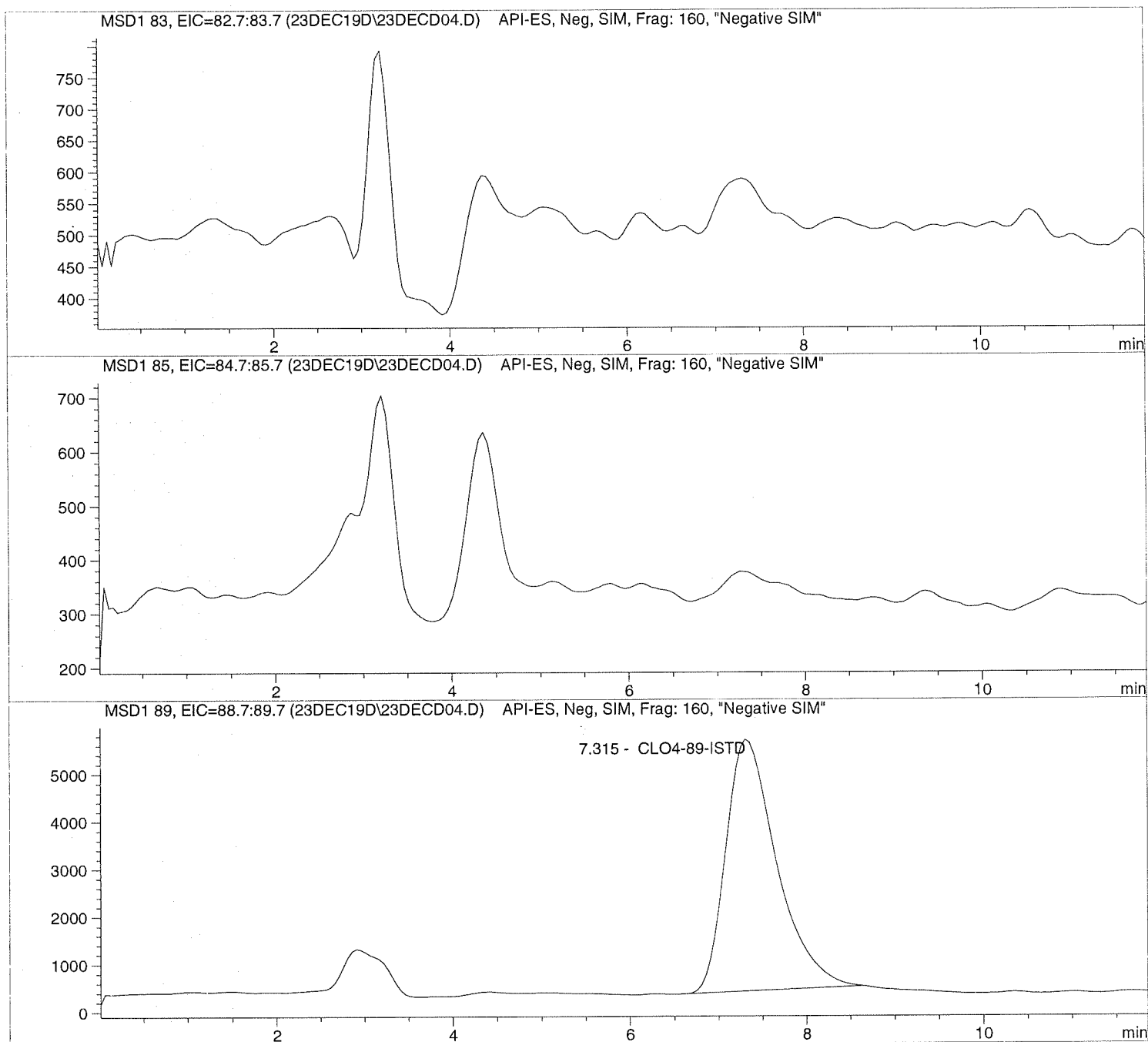
Sample Name: 689525 LMB

Injection Date: 12/23/2019 08:53:18
Sample Name: 689525 LMB
Acq Operator: TNB

Seq Line: 4
Location: Vial 74
Inj. No.: 1
Inj. Vol.: 35 μ l

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23DEC19D\23DEC04.D Sample Name: 689525 LMB

```

=====
Injection Date: 12/23/2019 08:53:18      Seq Line:          4
Sample Name:    689525 LMB                Location:         Vial 74
Acq Operator:   TNB                      Inj. No.:        1
                                           Inj. Vol.:       35 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  0.000
=====

```

```

=====
                          LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.315	PBA	213086.9	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

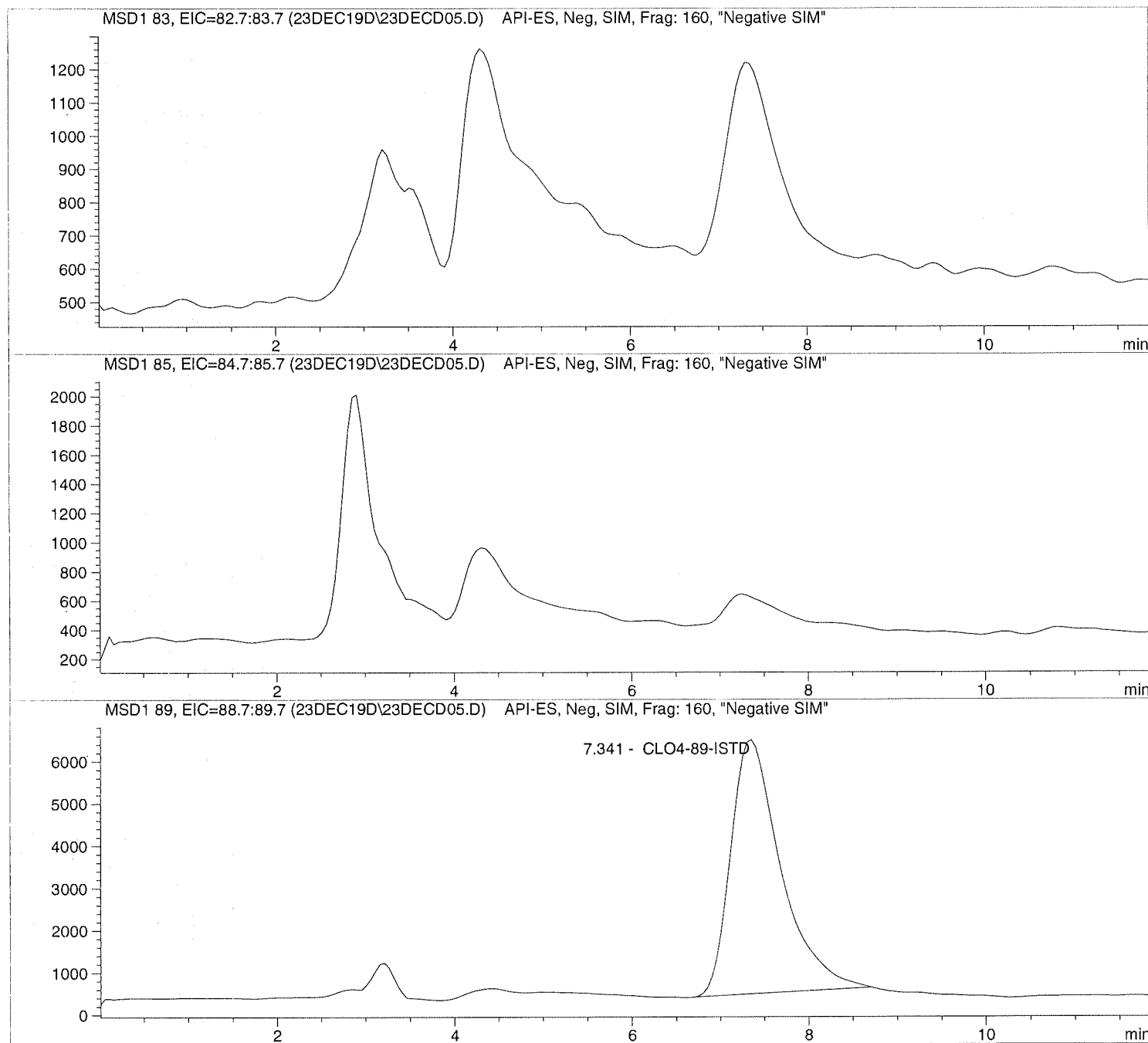
```

Injection Date: 12/23/2019 09:07:14
Sample Name: 1935345001
Acq Operator: TNB

Seq Line: 5
Location: Vial 75
Inj. No.: 1
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis




```
=====
Injection Date: 12/23/2019 09:07:14      Seq Line: 5
Sample Name: 1935345001                  Location: Vial 75
Acq Operator: TNB                         Inj. No.: 1
                                           Inj. Vol.: 35 µl
=====
```

```
Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45
=====
```

Perchlorate analysis

===== Sample Information =====

```
Sorted By: Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 0.000
=====
```

===== LCMS Results =====

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.341	PBA	238355.3	5.0000	CLO4-89-ISTD

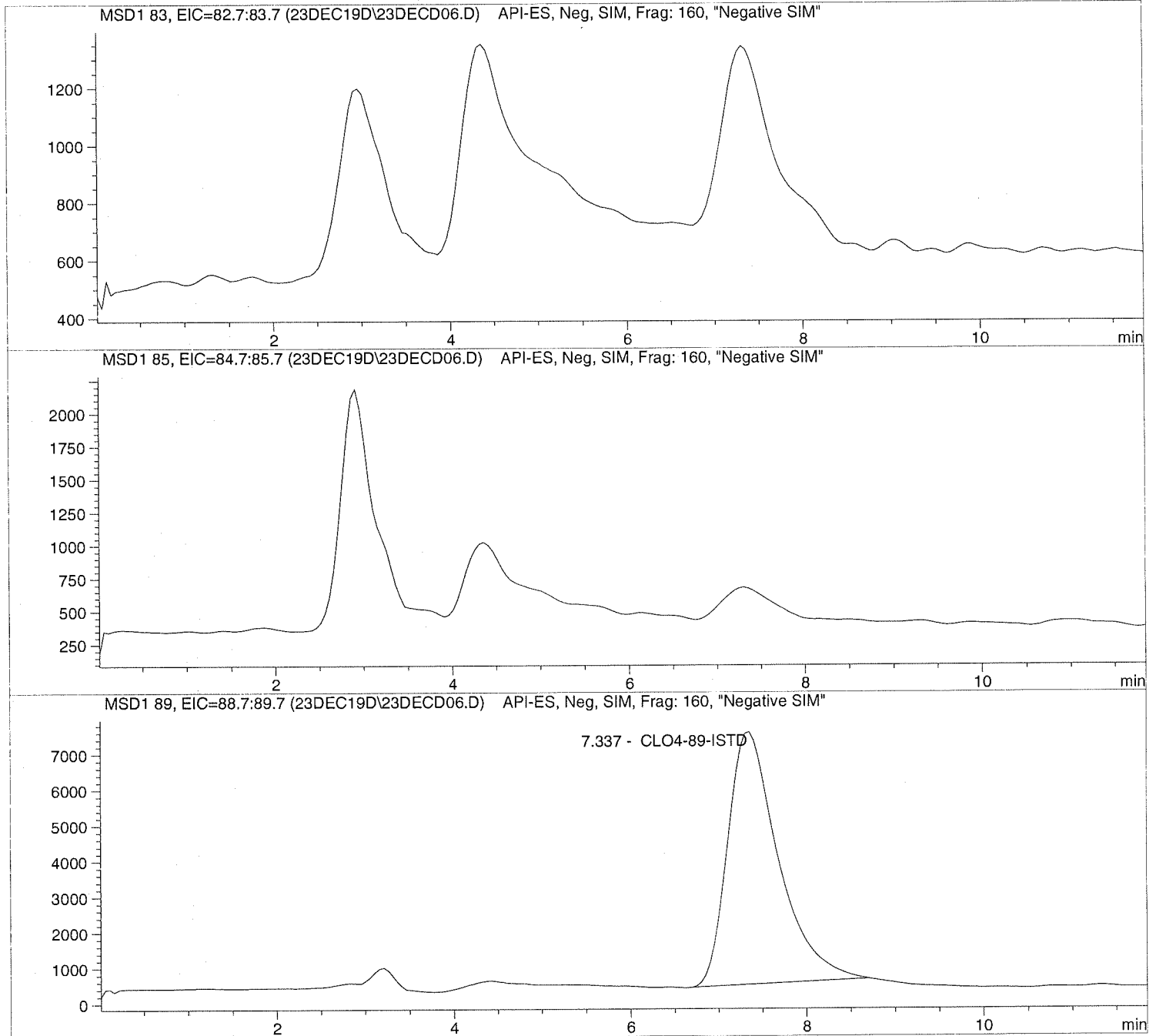
=====
*** End of Report ***

Injection Date: 12/23/2019 09:21:10
Sample Name: 1935345002
Acq Operator: TNB

Seq Line: 6
Location: Vial 76
Inj. No.: 1
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



```

=====
Injection Date: 12/23/2019 09:21:10      Seq Line: 6
Sample Name: 1935345002                  Location: Vial 76
Acq Operator: TNB                         Inj. No.: 1
                                           Inj. Vol.: 35 µl

```

```

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By: Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 0.000

```

```

=====
                          LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.337	PBA	283690.6	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***

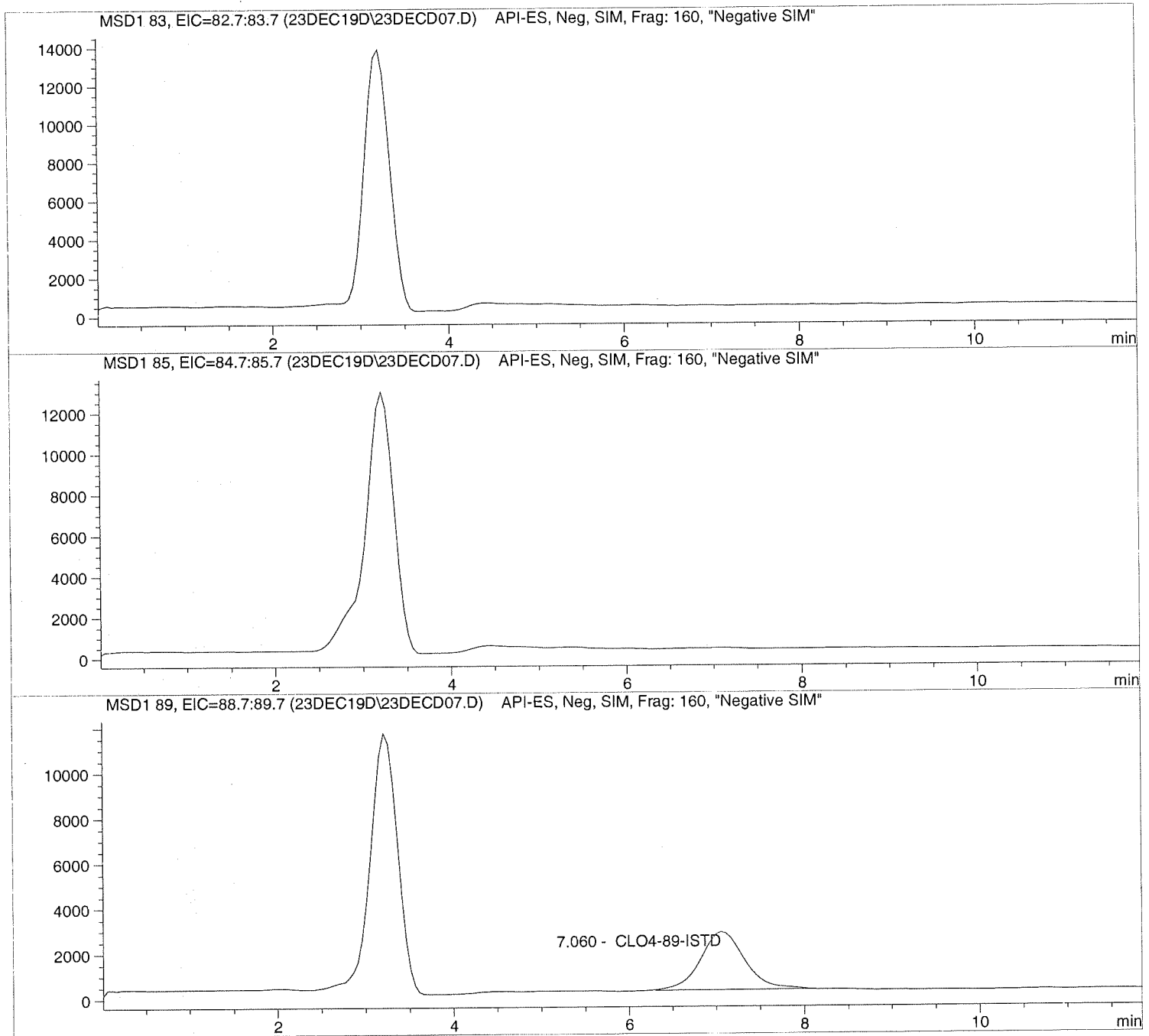
```

Injection Date: 12/23/2019 09:35:04
Sample Name: 1935345003
Acq Operator: TNB

Seq Line: 7
Location: Vial 77
Inj. No.: 1
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



```
=====
Injection Date: 12/23/2019 09:35:04      Seq Line: 7
Sample Name: 1935345003                  Location: Vial 77
Acq Operator: TNB                        Inj. No.: 1
                                           Inj. Vol.: 35 µl
=====
```

```
Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45
```

Perchlorate analysis

===== Sample Information =====

```
Sorted By: Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 0.000
```

===== LCMS Results =====

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.060	BBA	89834.5	5.0000	CLO4-89-ISTD

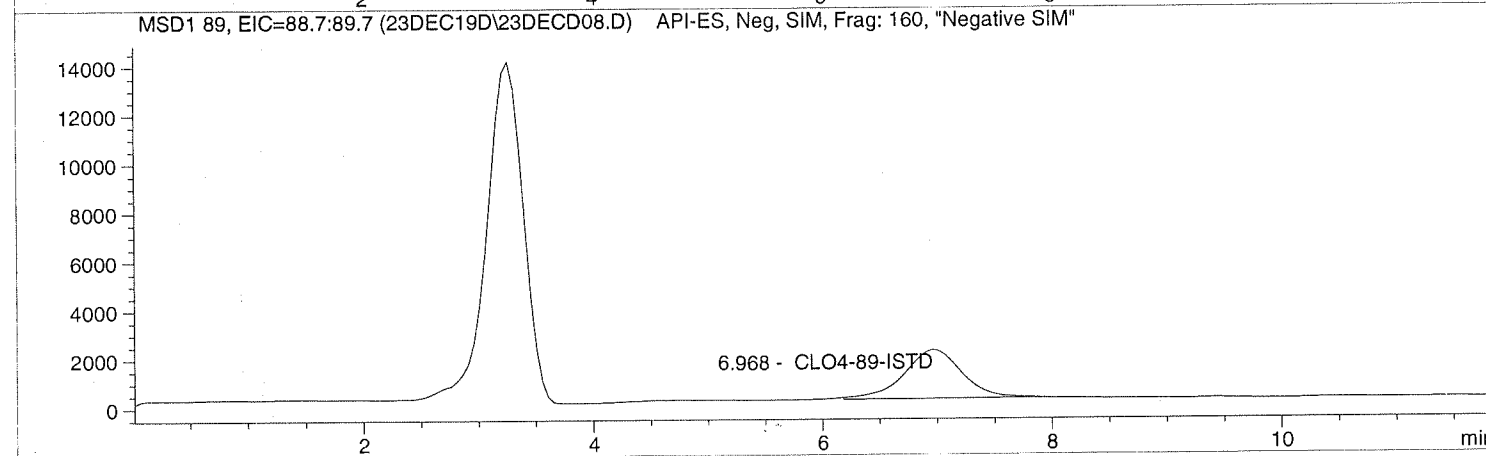
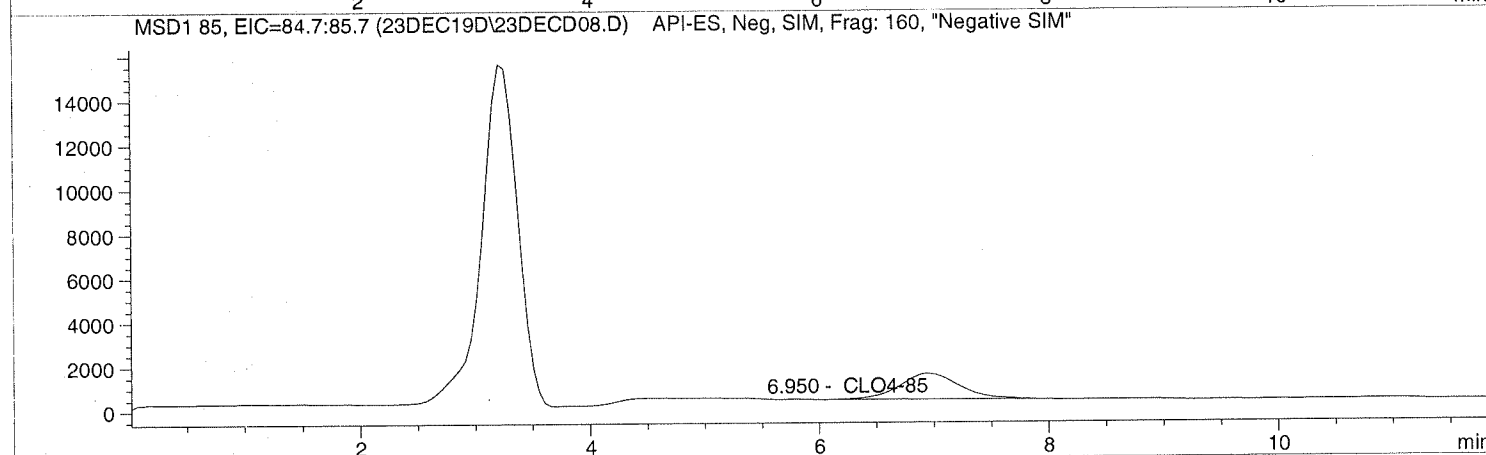
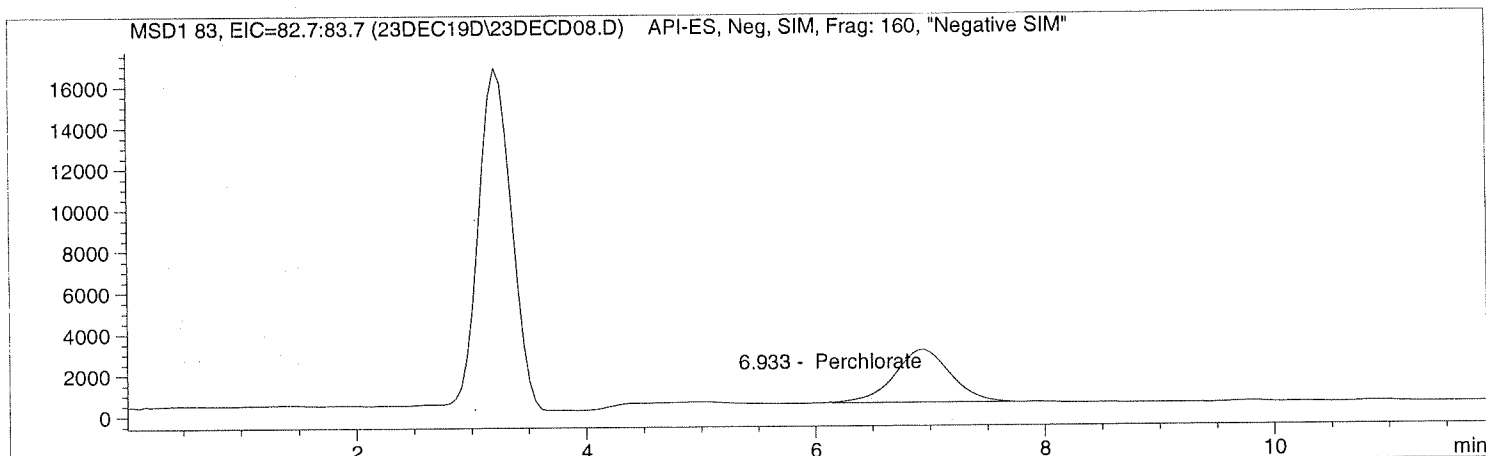
=====
*** End of Report ***

Injection Date: 12/23/2019 09:48:56
Sample Name: 1935345004
Acq Operator: TNB

Seq Line: 8
Location: Vial 78
Inj. No.: 1
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



```
=====  
Injection Date: 12/23/2019 09:48:56      Seq Line:      8  
Sample Name:   1935345004                Location:      Vial 78  
Acq Operator:  TNB                       Inj. No.:     1  
                                           Inj. Vol.:    35 µl  
=====
```

```
Acq. Method:   CLO4-AQN.M  
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M  
Last Changed:  11/5/2019 08:44:45  
=====
```

Perchlorate analysis

=====
Sample Information
=====

```
Sorted By:      Signal  
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm  
Multiplier:    1.000000  
Dilution:      1.000000  
Sample Amount: 0.000  
=====
```

=====
LCMS Results
=====

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.933	BBA	86879.4	4.6286	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.950	PBA	41927.1	7.1903	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.968	BBA	69203.5	5.0000	CLO4-89-ISTD

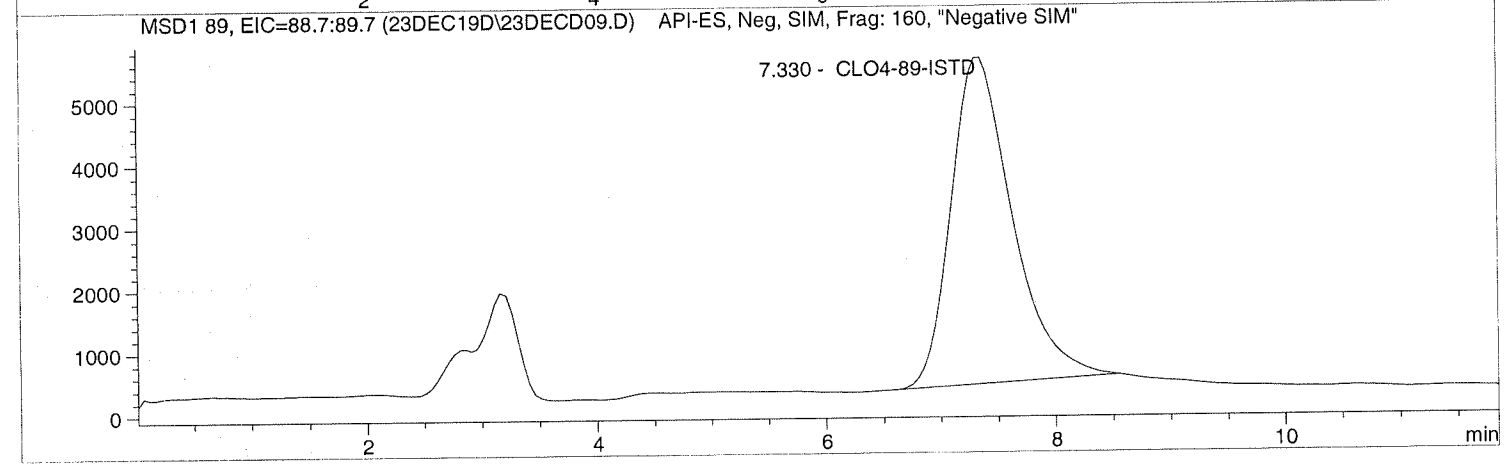
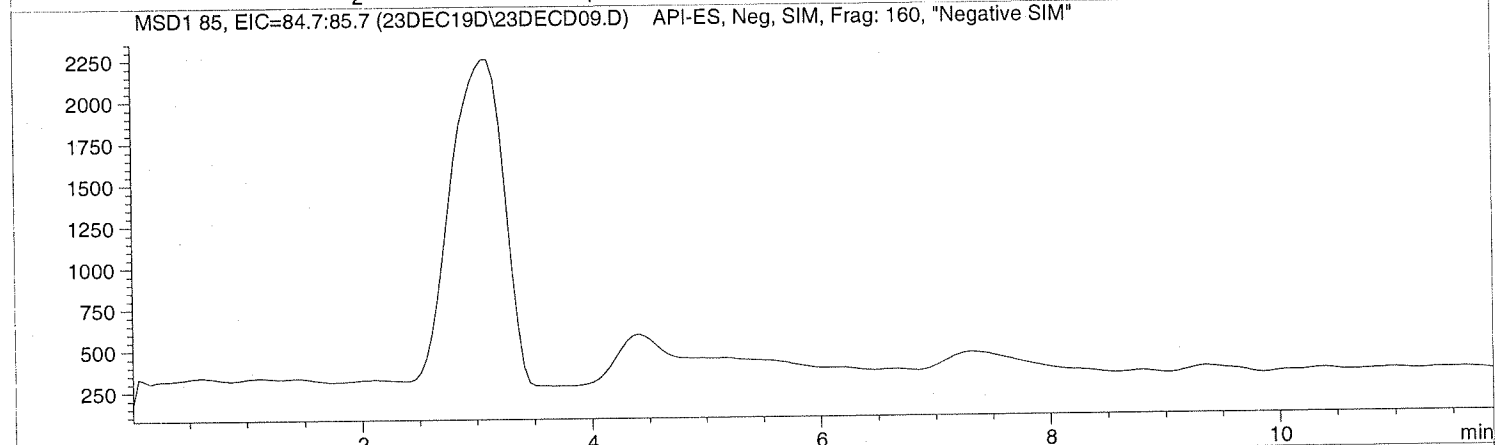
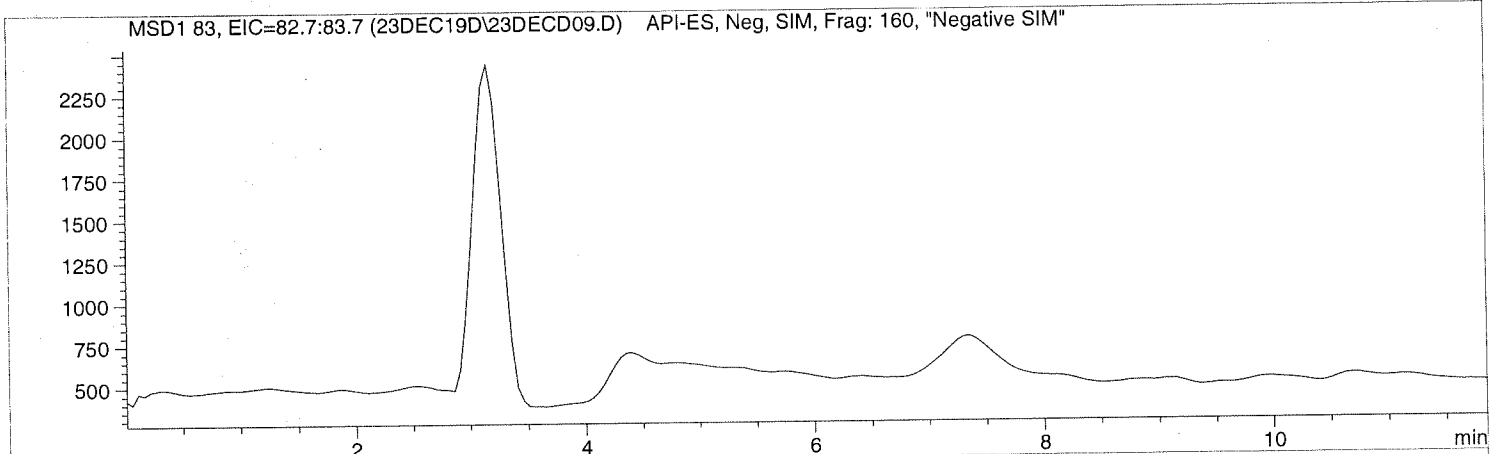
=====
*** End of Report ***
=====

Injection Date: 12/23/2019 10:02:49
Sample Name: 1935345005
Acq Operator: TNB

Seq Line: 9
Location: Vial 79
Inj. No.: 1
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis




```
=====
Injection Date: 12/23/2019 10:02:49      Seq Line:          9
Sample Name:    1935345005                Location:         Vial 79
Acq Operator:   TNB                       Inj. No.:        1
                                           Inj. Vol.:       35 µl
=====
```

```
Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   11/5/2019 08:44:45
=====
```

Perchlorate analysis

===== Sample Information =====

```
Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  0.000
=====
```

===== LCMS Results =====

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.330	PBA	193530.4	5.0000	CLO4-89-ISTD

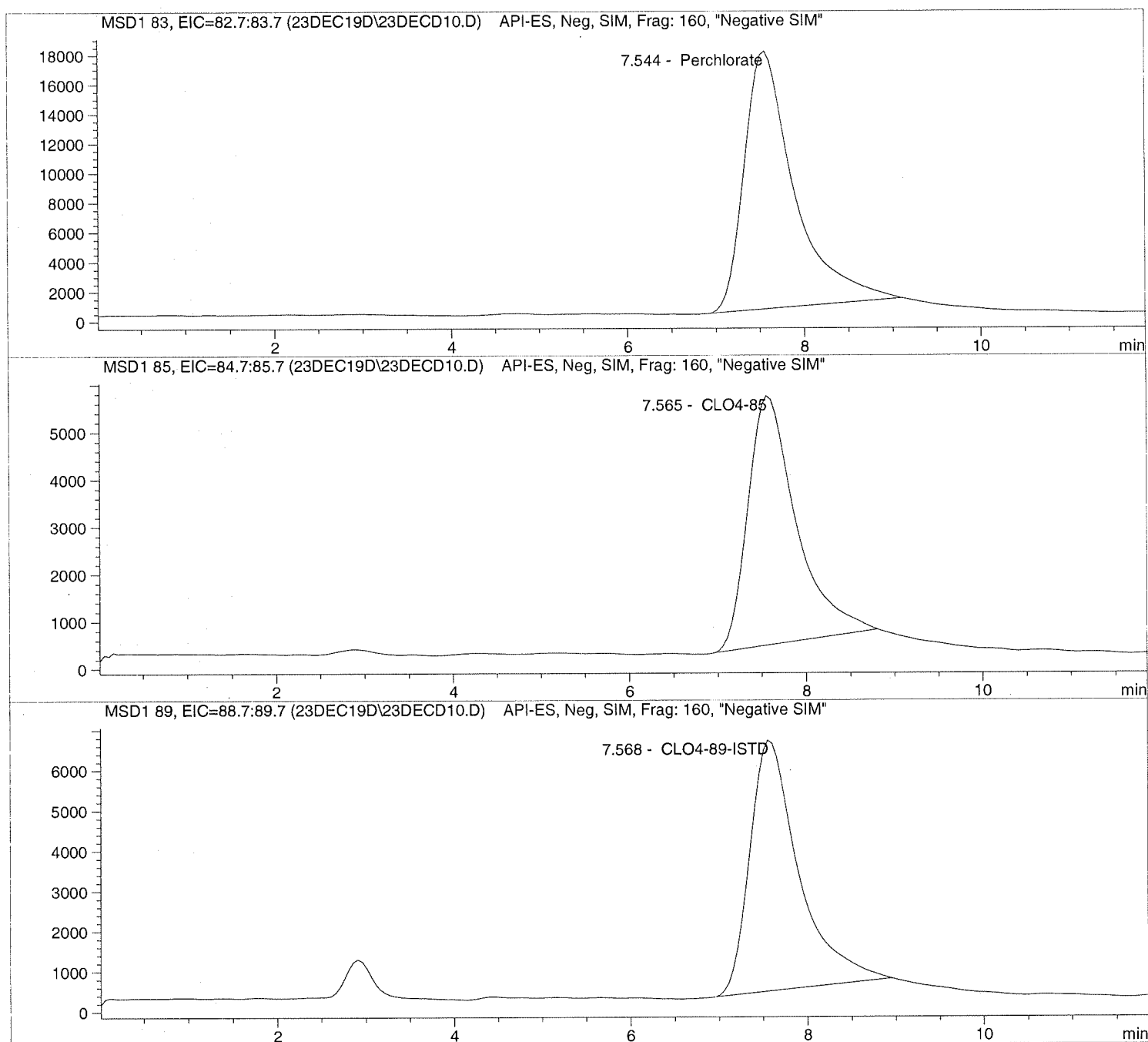
=====
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\23DEC19D\23DECD10.D Sample Name: 1935345006 100

```
=====
Injection Date: 12/23/2019 10:16:44      Seq Line:      10
Sample Name:   1935345006 100             Location:      Vial 80
Acq Operator:  TNB                       Inj. No.:     1
                                           Inj. Vol.:    35 µl
=====
```

```
Acq. Method:   CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:  11/5/2019 08:44:45
```

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23DEC19D\23DECD10.D Sample Name: 1935345006 100

```

=====
Injection Date: 12/23/2019 10:16:44      Seq Line:      10
Sample Name:   1935345006 100             Location:      Vial 80
Acq Operator:  TNB                       Inj. No.:     1
                                           Inj. Vol.:    35 µl
=====

```

```

Acq. Method:   CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:  11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:    1.000000
Dilution:      100.000000
Sample Amount: 0.000
=====

```

```

=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.544	PBA	685819.4	1037.7700	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.565	PBA	200418.5	987.2414	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.568	PBA	239667.0	500.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

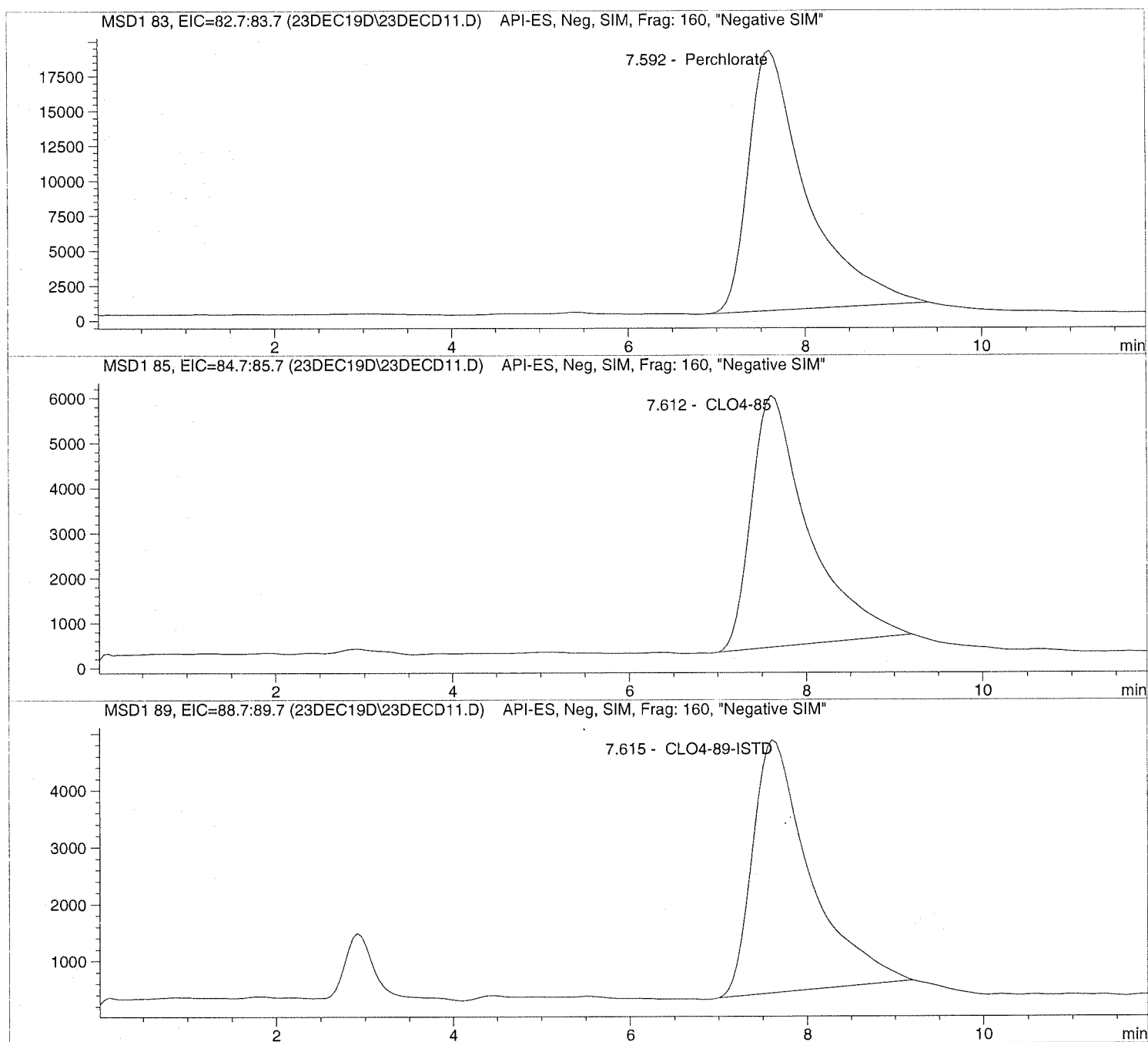
```

Data file: C:\HPCHEM\1\DATA\23DEC19D\23DECD11.D Sample Name: 1935345007 1K

```
=====
Injection Date: 12/23/2019 10:30:38      Seq Line:      11
Sample Name:    1935345007 1K             Location:      Vial 81
Acq Operator:   TNB                       Inj. No.:     1
                                           Inj. Vol.:    35 µl
=====
```

```
Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   11/5/2019 08:44:45
```

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23DEC19D\23DECD11.D Sample Name: 1935345007 1K

```

=====
Injection Date: 12/23/2019 10:30:38      Seq Line:      11
Sample Name:    1935345007 1K            Location:      Vial 81
Acq Operator:   TNB                      Inj. No.:     1
                                           Inj. Vol.:    35 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:      1000.000000
Sample Amount:  0.000
=====

```

```

=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.592	PBA	848401.4	14986.6893	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.612	PBA	250753.5	14479.3444	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.615	PBA	201594.0	5000.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

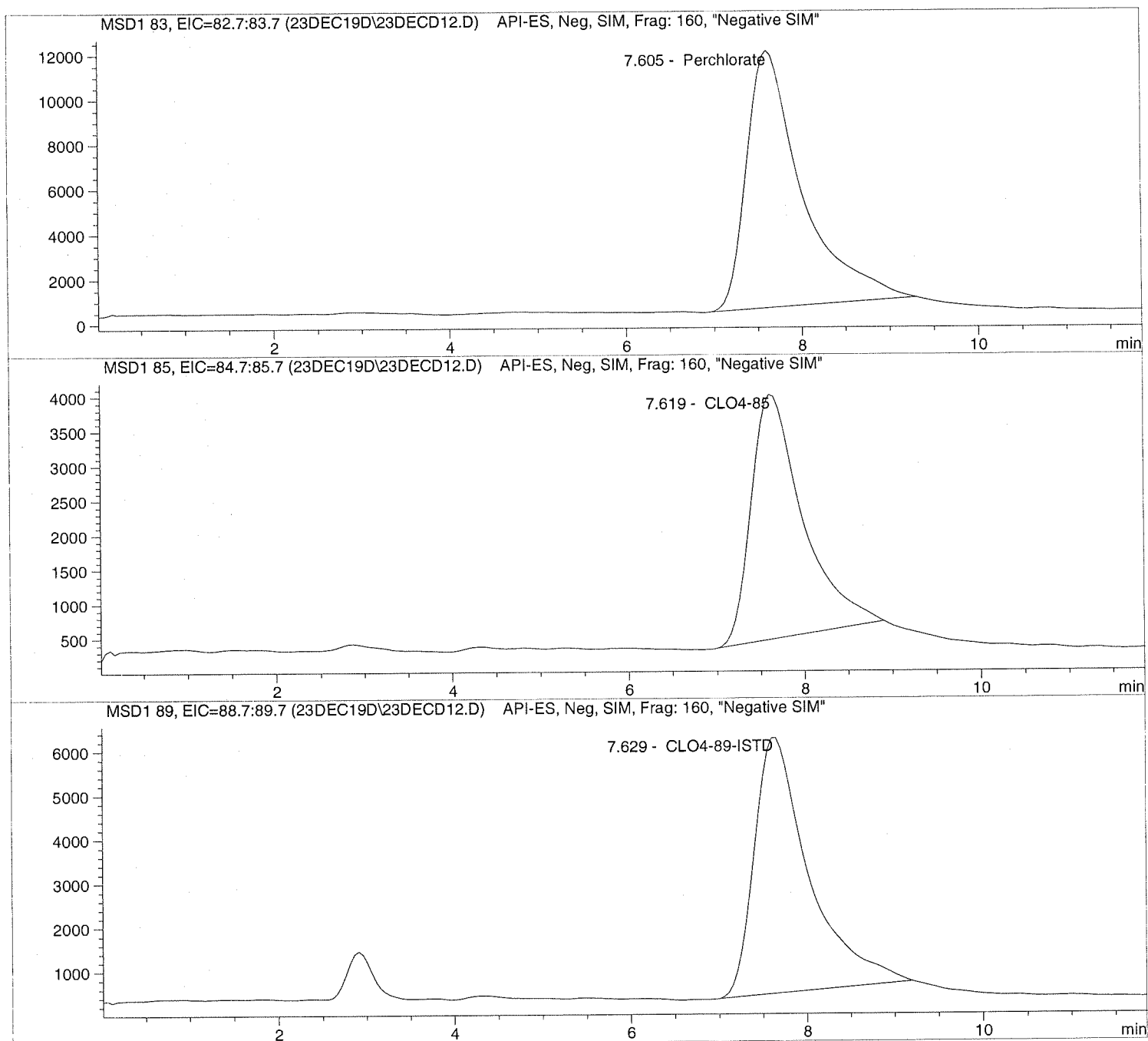
```

Data file: C:\HPCHEM\1\DATA\23DEC19D\23DECD12.D Sample Name: 1935345008 10K

```
=====
Injection Date: 12/23/2019 10:44:29      Seq Line: 12
Sample Name: 1935345008 10K              Location: Vial 82
Acq Operator: TNB                          Inj. No.: 1
                                           Inj. Vol.: 35 µl
=====
```

```
Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45
```

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23DEC19D\23DECD12.D Sample Name: 1935345008 10K

```

=====
Injection Date: 12/23/2019 10:44:29      Seq Line:          12
Sample Name:   1935345008 10K             Location:         Vial 82
Acq Operator:  TNB                       Inj. No.:        1
                                           Inj. Vol.:       35 µl
=====

```

```

Acq. Method:   CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:  11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:    1.000000
Dilution:      10000.000000
Sample Amount: 0.000
=====

```

```

=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.605	PBA	501020.7	73174.5193	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.619	PBA	144991.8	68589.2543	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.629	PBA	250964.5	50000.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

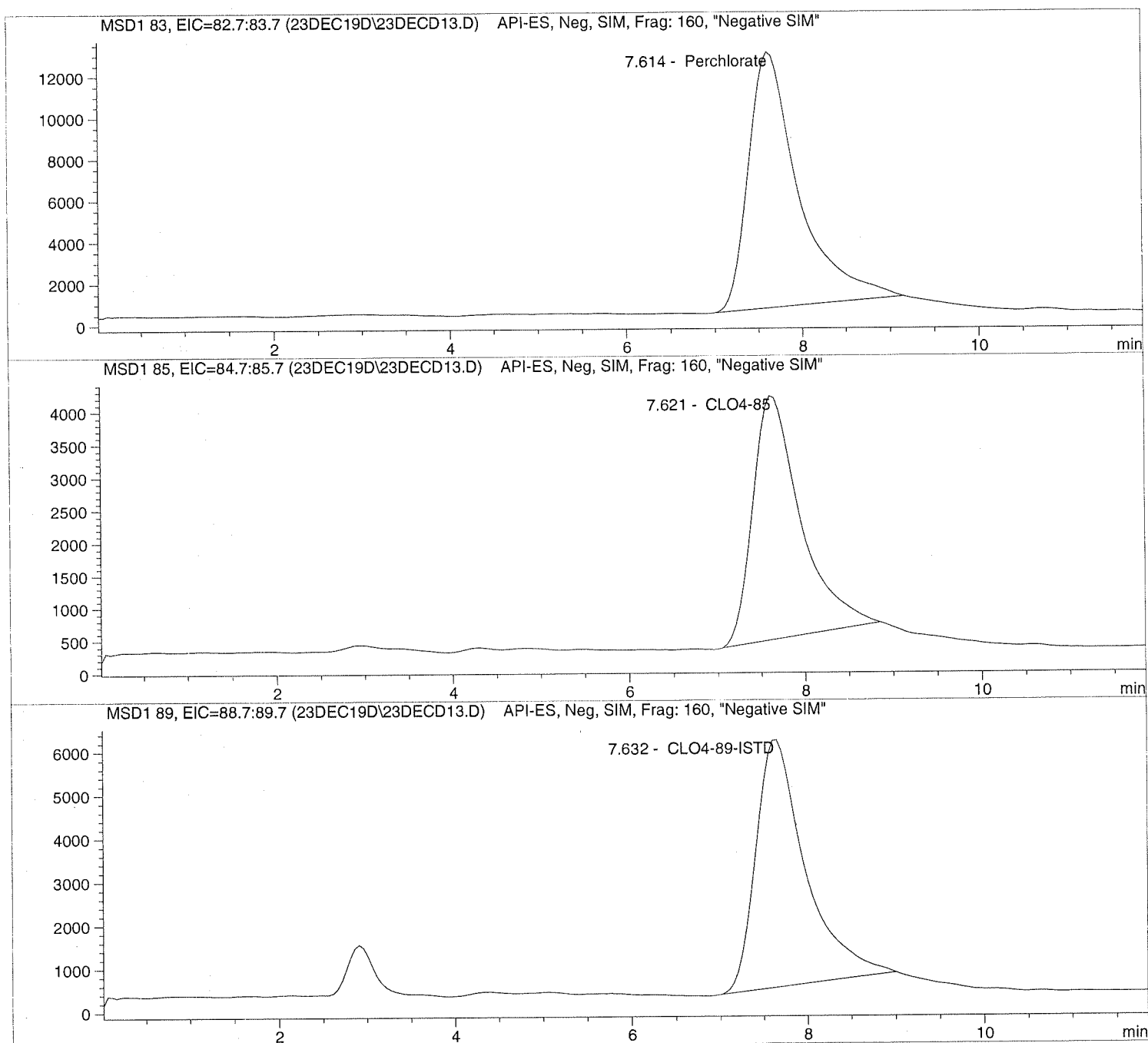
```

Data file: C:\HPCHEM\1\DATA\23DEC19D\23DECD13.D Sample Name: 1935345009 10K

```
=====
Injection Date: 12/23/2019 10:58:21      Seq Line:      13
Sample Name:    1935345009 10K           Location:      Vial 83
Acq Operator:   TNB                      Inj. No.:     1
                                           Inj. Vol.:    35 µl
=====
```

```
Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   11/5/2019 08:44:45
```

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23DEC19D\23DECD13.D Sample Name: 1935345009 10K

```

=====
Injection Date: 12/23/2019 10:58:21      Seq Line:          13
Sample Name:   1935345009 10K           Location:         Vial 83
Acq Operator:  TNB                      Inj. No.:        1
                                           Inj. Vol.:       35 µl
=====

```

```

Acq. Method:   CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:  11/5/2019 08:44:45
=====

```

Perchlorate analysis

Sample Information

```

=====
Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       10000.000000
Sample Amount:  0.000
=====

```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.614	PBA	488879.8	79598.8740	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.621	PBA	142325.9	75155.2365	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.632	PBA	224661.1	50000.0000	CLO4-89-ISTD

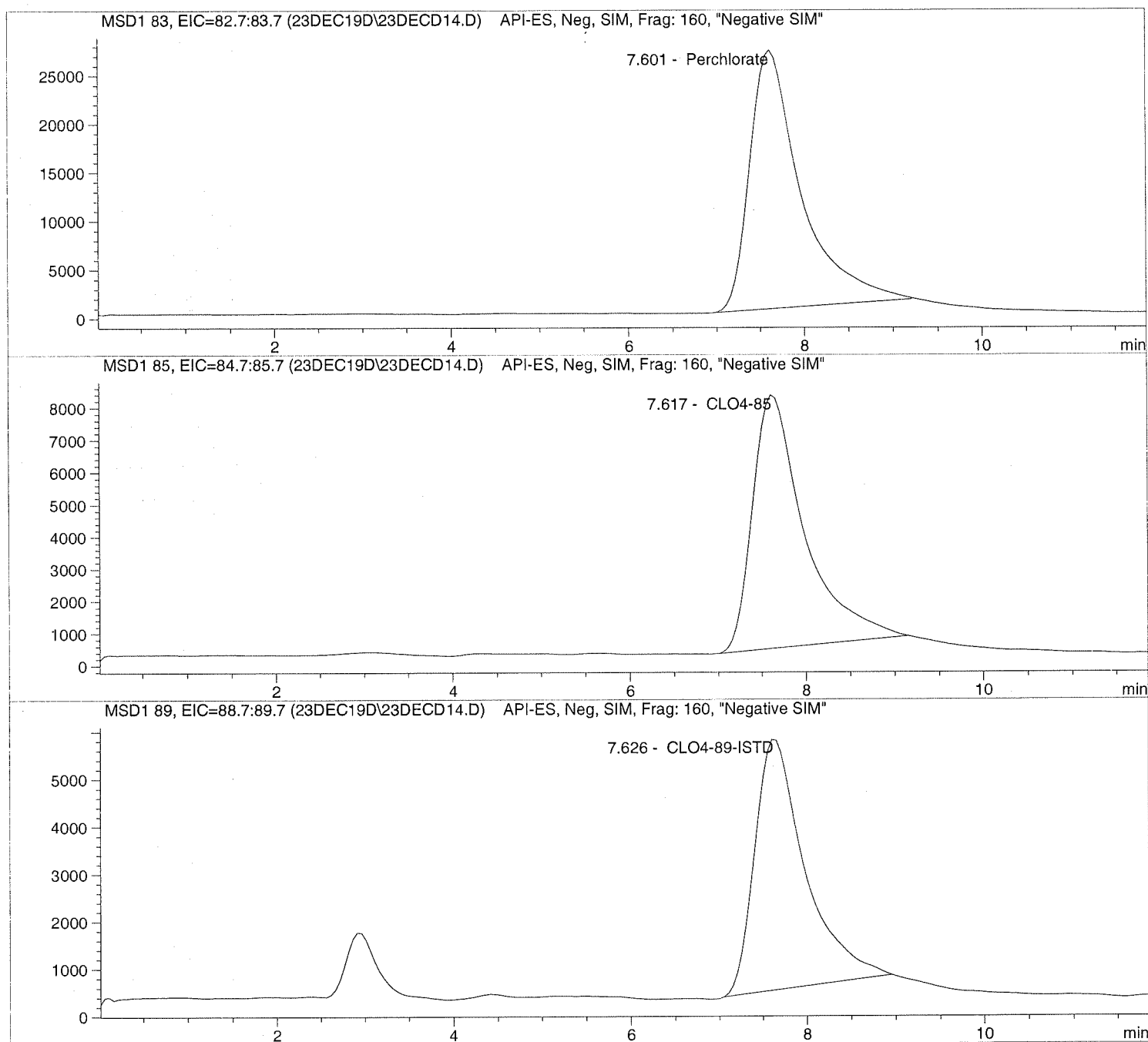
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\23DEC19D\23DECD14.D Sample Name: 1935345010 100

```
=====
Injection Date: 12/23/2019 11:12:11      Seq Line: 14
Sample Name: 1935345010 100              Location: Vial 84
Acq Operator: TNB                        Inj. No.: 1
                                           Inj. Vol.: 35 µl
=====
```

```
Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45
```

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23DEC19D\23DECD14.D Sample Name: 1935345010 100

```

=====
Injection Date: 12/23/2019 11:12:11      Seq Line:          14
Sample Name:   1935345010 100            Location:         Vial 84
Acq Operator:  TNB                       Inj. No.:        1
                                           Inj. Vol.:       35 µl
=====

```

```

Acq. Method:   CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:  11/5/2019 08:44:45
=====

```

Perchlorate analysis

Sample Information

```

=====
Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:    1.000000
Dilution:      100.000000
Sample Amount: 0.000
=====

```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.601	PBA	1076000.9	1802.1441	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.617	PBA	322492.7	1767.8734	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.626	PBA	209986.7	500.0000	CLO4-89-ISTD

*** End of Report ***

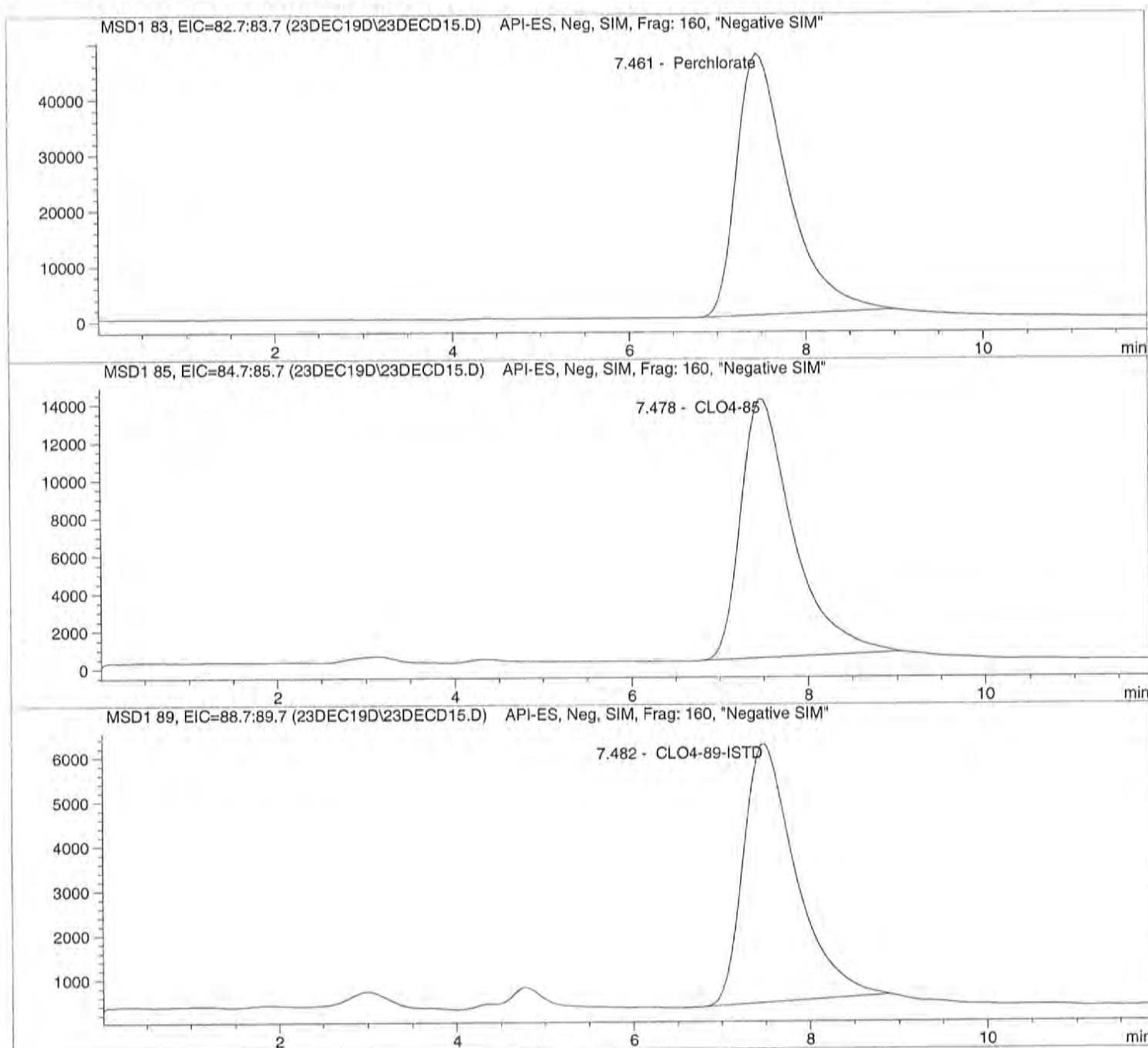
Data file: C:\HPCHEM\1\DATA\23DEC19D\23DECD15.D Sample Name: 689414 CCV@25

Injection Date: 12/23/2019 11:26:02 Seq Line: 15
Sample Name: 689414 CCV@25 Location: Vial 71
Acq Operator: TNB *Sas* Inj. No.: 1
Inj. Vol.: 35 µl

T.B 12.23.19

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23DEC19D\23DECD15.D

Sample Name: 689414 CCV@25

Injection Date: 12/23/2019 11:26:02
 Sample Name: 689414 CCV@25
 Acq Operator: TNB 528

Seq Line: 15
 Location: Vial 71
 Inj. No.: 1
 Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M
 Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
 Last Changed: 11/5/2019 08:44:45

Perchlorate analysis

Sample Information

Sorted By: Signal
 Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
 Multiplier: 1.000000
 Dilution: 1.000000
 Sample Amount: 25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.461	PBA	1910947.6	26.9979	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.478	PBA	566704.3	26.3409	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.482	PBA	239872.9	5.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\23DEC19D\23DECD16.D

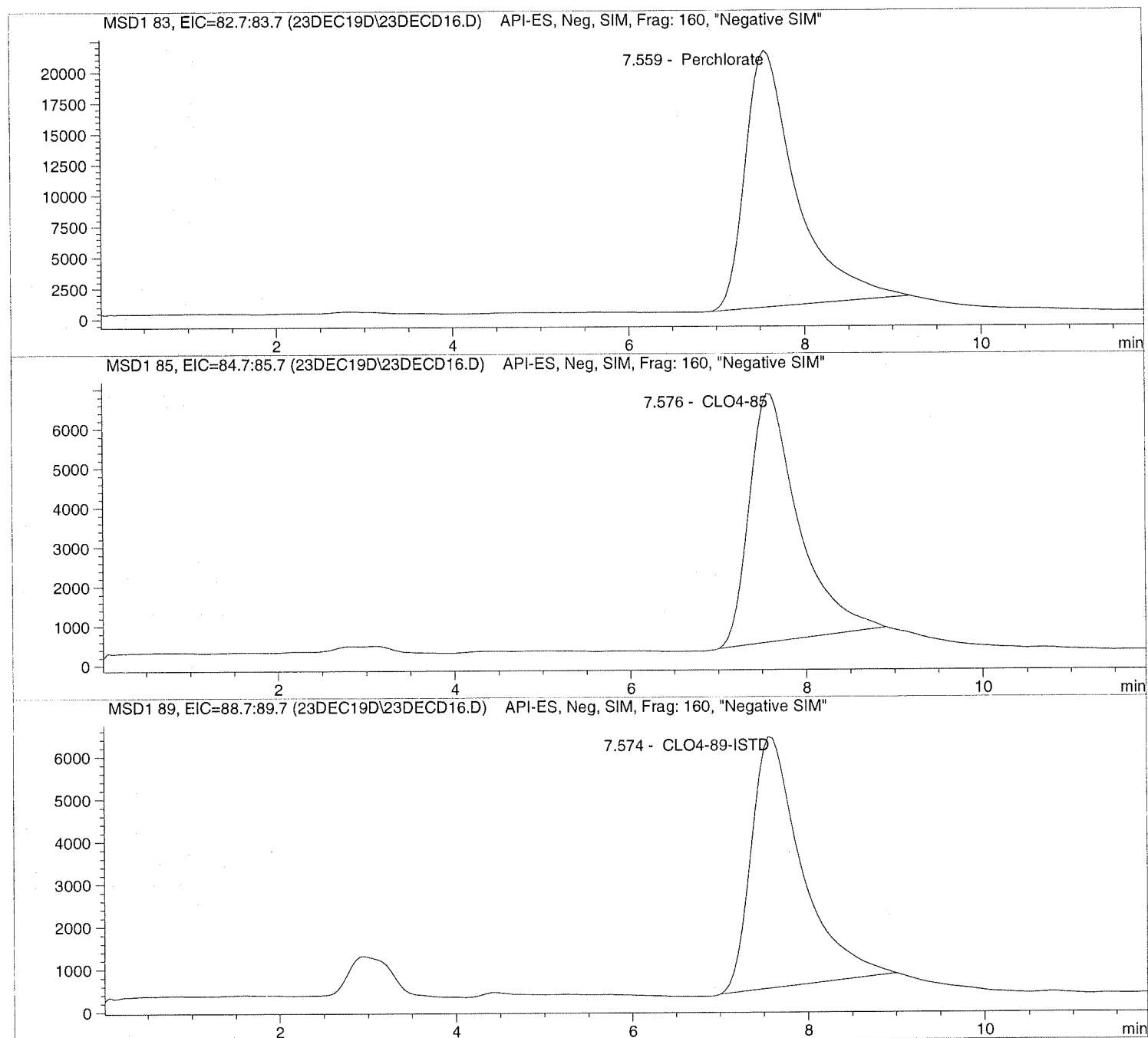
Sample Name: 1935347001 1K

=====
Injection Date: 12/23/2019 11:39:57
Sample Name: 1935347001 1K
Acq Operator: TNB

Seq Line: 16
Location: Vial 85
Inj. No.: 1
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23DEC19D\23DECD16.D Sample Name: 1935347001 1K

```

=====
Injection Date: 12/23/2019 11:39:57      Seq Line:      16
Sample Name:    1935347001 1K            Location:      Vial 85
Acq Operator:   TNB                      Inj. No.:     1
                                           Inj. Vol.:    35 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:    1.000000
Dilution:      1000.000000
Sample Amount: 0.000
=====

```

```

=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.559	PBA	833844.3	12751.9297	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.576	PBA	243643.4	12161.9406	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.574	PBA	234965.2	5000.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\23DEC19D\23DECD17.D

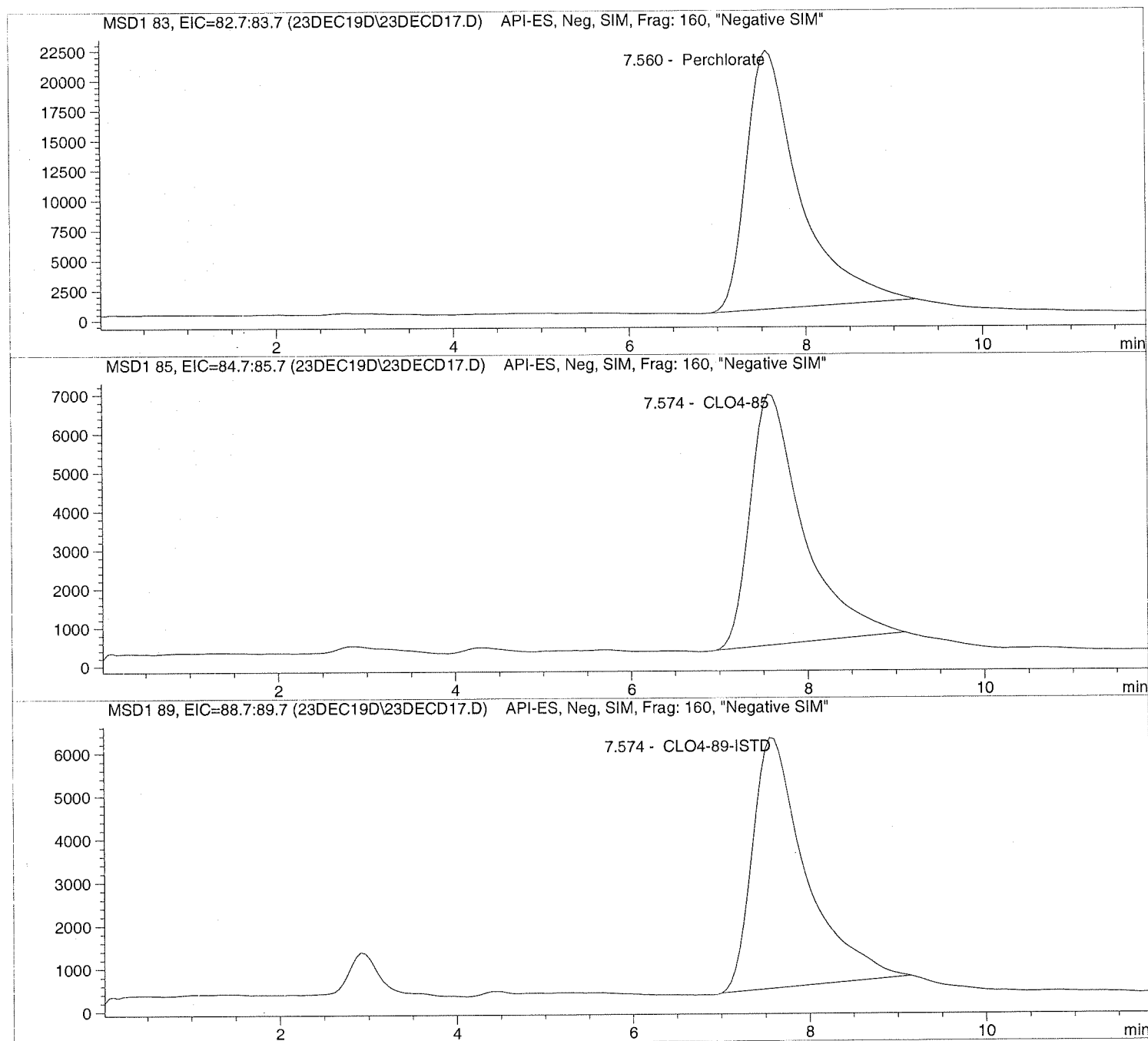
Sample Name: 1935347002 1K

=====
Injection Date: 12/23/2019 11:53:49
Sample Name: 1935347002 1K
Acq Operator: TNB

Seq Line: 17
Location: Vial 86
Inj. No.: 1
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23DEC19D\23DECD17.D Sample Name: 1935347002 1K

```

=====
Injection Date: 12/23/2019 11:53:49      Seq Line:          17
Sample Name:   1935347002 1K             Location:         Vial 86
Acq Operator:  TNB                       Inj. No.:        1
                                           Inj. Vol.:       35 µl
=====

```

```

Acq. Method:   CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:  11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:    1.000000
Dilution:      1000.000000
Sample Amount: 0.000
=====

```

```

=====
                          LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.560	PBA	901055.0	13240.2824	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.574	PBA	268208.5	12860.7607	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.574	PBA	244063.0	5000.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

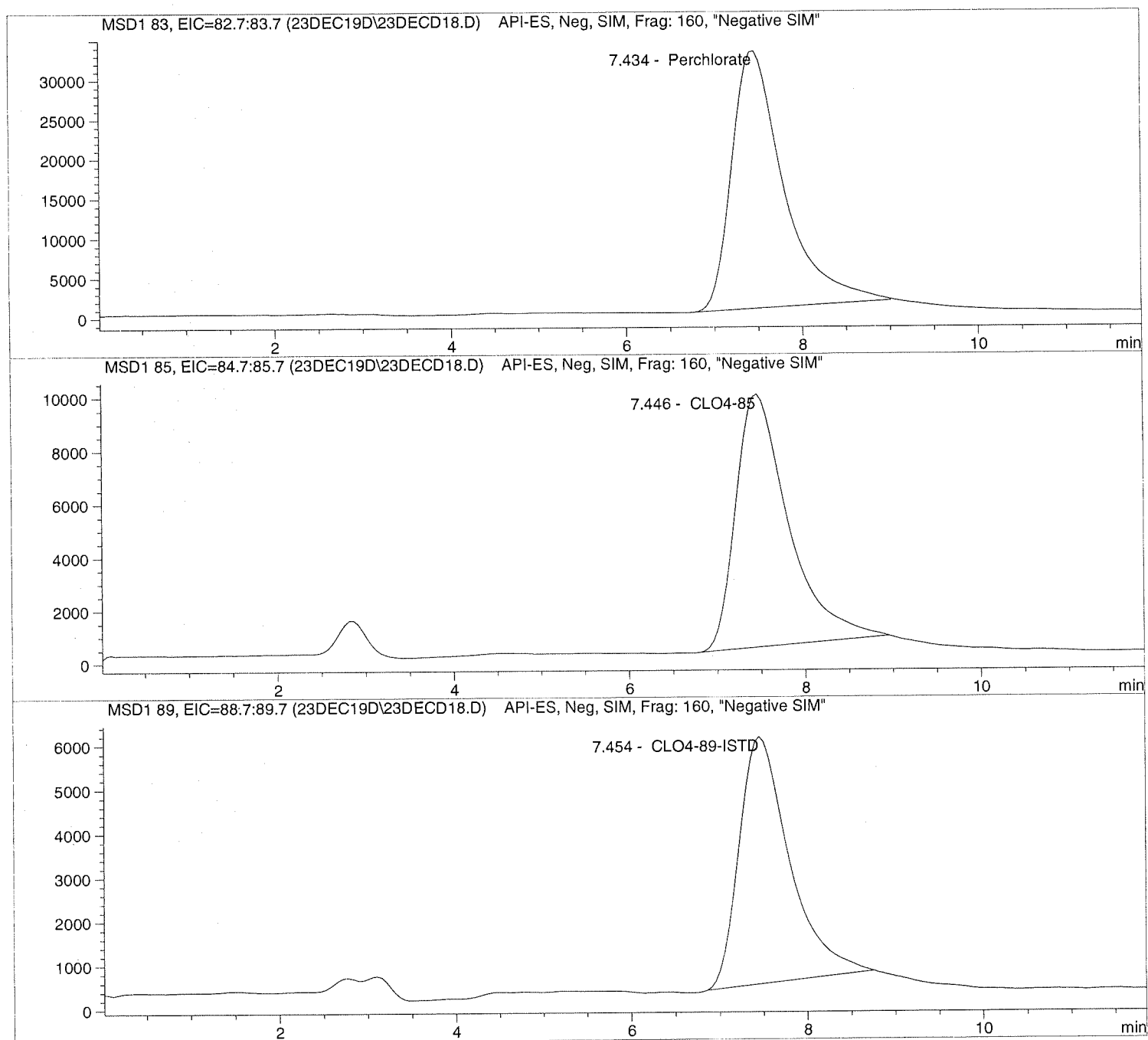
```

Data file: C:\HPCHEM\1\DATA\23DEC19D\23DECD18.D Sample Name: 1935347003 10X

```
=====
Injection Date: 12/23/2019 12:07:42      Seq Line: 18
Sample Name: 1935347003 10X              Location: Vial 87
Acq Operator: TNB                          Inj. No.: 1
                                           Inj. Vol.: 35 µl
=====
```

```
Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45
```

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23DEC19D\23DECD18.D Sample Name: 1935347003 10X

```

=====
Injection Date: 12/23/2019 12:07:42      Seq Line:          18
Sample Name:    1935347003 10X           Location:          Vial 87
Acq Operator:   TNB                      Inj. No.:         1
                                           Inj. Vol.:        35 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       10.000000
Sample Amount:  0.000
=====

```

```

=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.434	PBA	1335757.6	207.3848	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.446	PBA	397795.7	202.5295	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.454	PBA	223994.3	50.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\23DEC19D\23DECD21.D

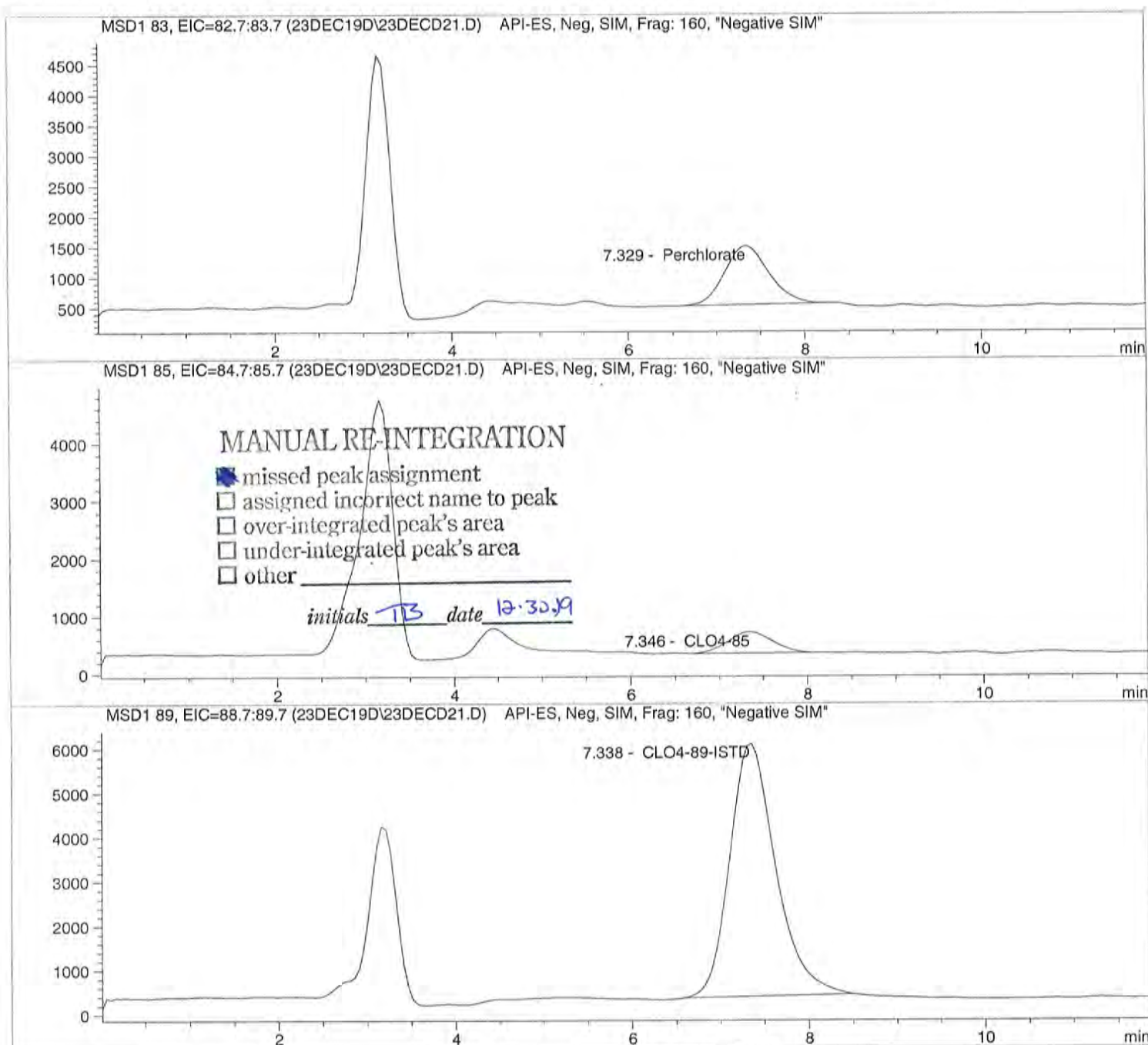
Sample Name: 1935347006

Injection Date: 12/23/2019 12:49:23
 Sample Name: 1935347006
 Acq Operator: TNB

Seq Line: 21
 Location: Vial 90
 Inj. No.: 1
 Inj. Vol.: 35 μ l

Acq. Method: CLO4-AQN.M
 Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
 Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



```
=====
Injection Date: 12/23/2019 12:49:23      Seq Line: 21
Sample Name: 1935347006                  Location: Vial 90
Acq Operator: TNB                        Inj. No.: 1
                                           Inj. Vol.: 35 µl
=====
```

```
Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45
```

Perchlorate analysis

===== Sample Information =====

```
Sorted By: Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 0.000
```

===== LCMS Results =====

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.329	PBA	33750.8	0.5414	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.346	MM	13025.6	0.6212	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.338	BBA	206441.3	5.0000	CLO4-89-ISTD

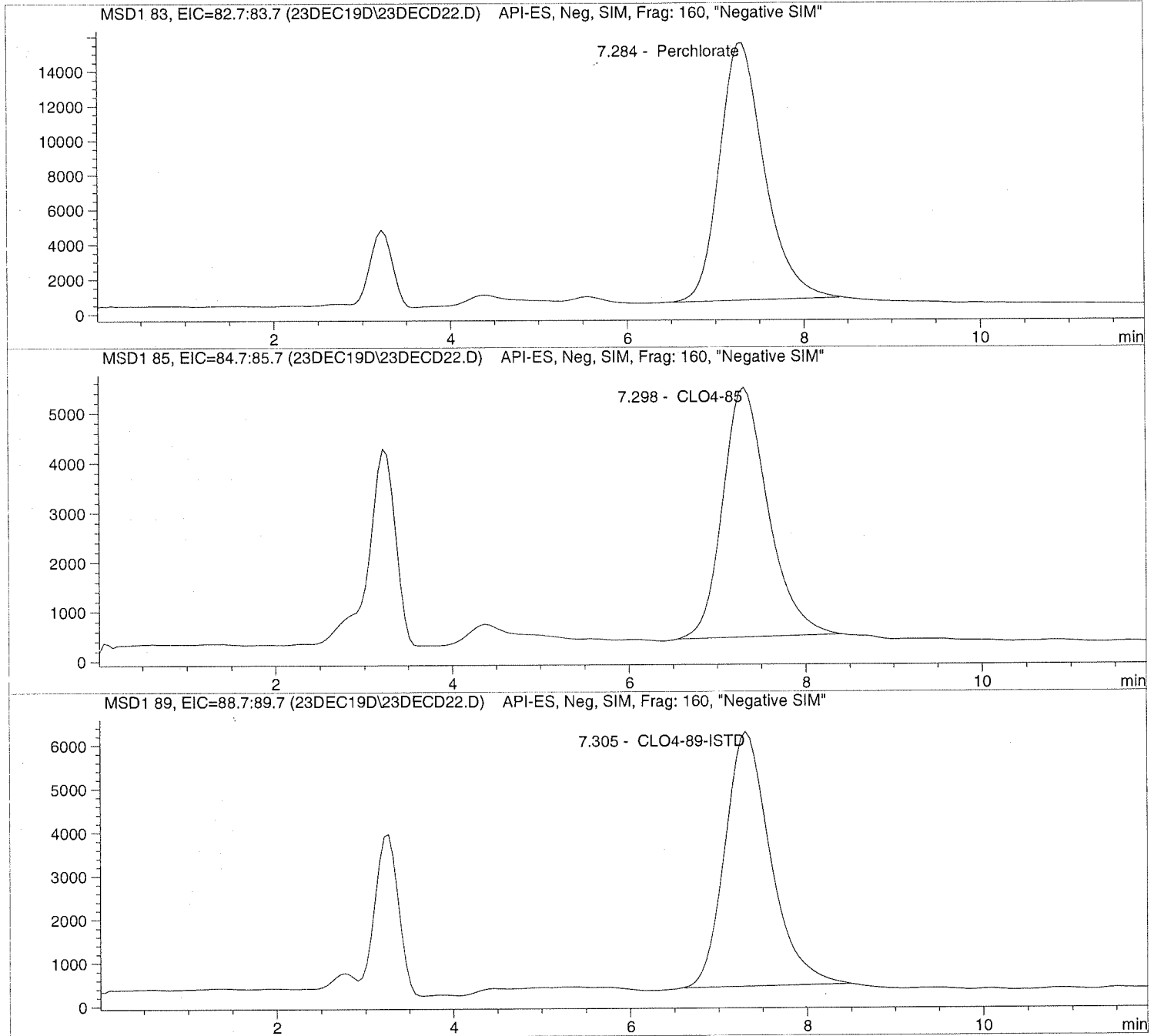
=====
*** End of Report ***

Injection Date: 12/23/2019 13:03:18
Sample Name: 1935347007
Acq Operator: TNB

Seq Line: 22
Location: Vial 91
Inj. No.: 1
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



```
=====
Injection Date: 12/23/2019 13:03:18      Seq Line:      22
Sample Name:    1935347007                Location:      Vial 91
Acq Operator:   TNB                       Inj. No.:     1
                                           Inj. Vol.:    35 µl
=====
```

```
Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   11/5/2019 08:44:45
=====
```

Perchlorate analysis

===== Sample Information =====

```
Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  0.000
=====
```

===== LCMS Results =====

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.284	BBA	521432.8	9.0837	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.298	BBA	179359.4	10.1168	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.305	BBA	209168.8	5.0000	CLO4-89-ISTD

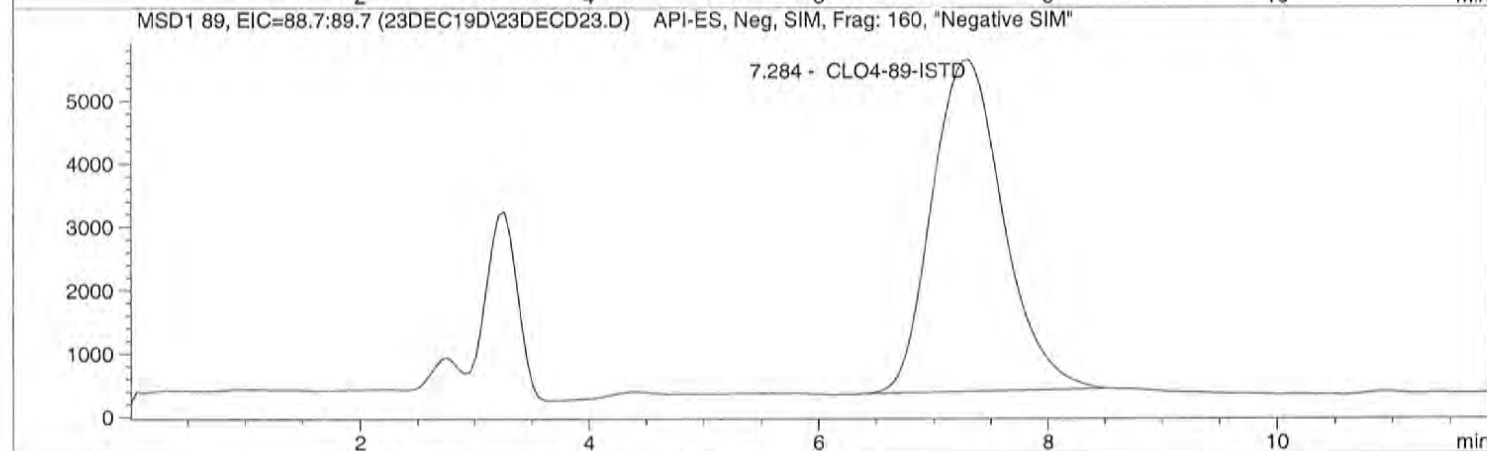
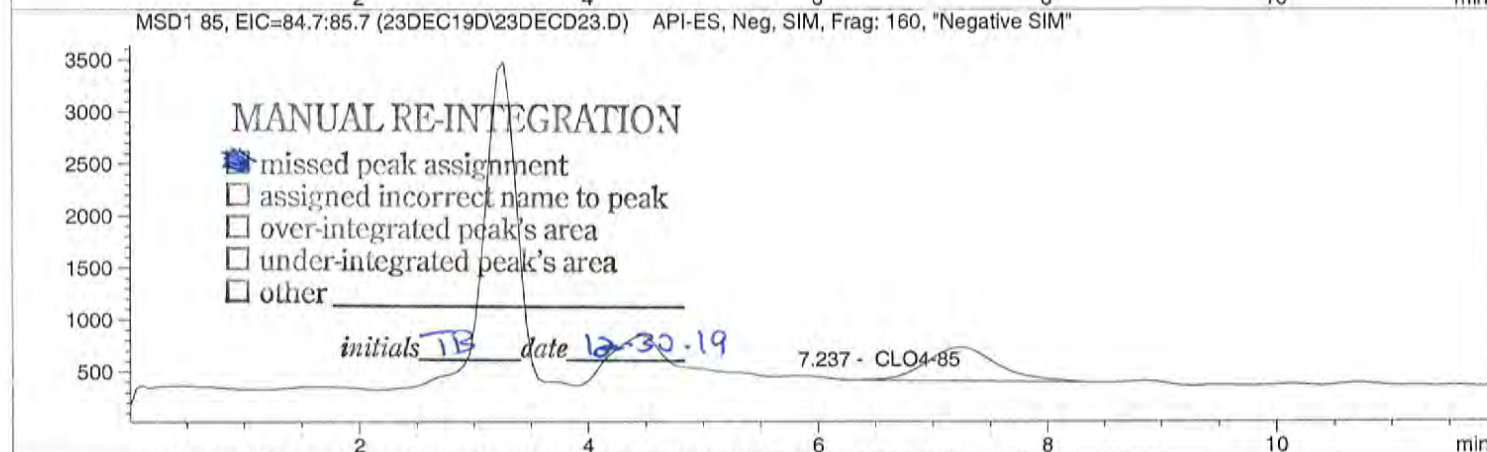
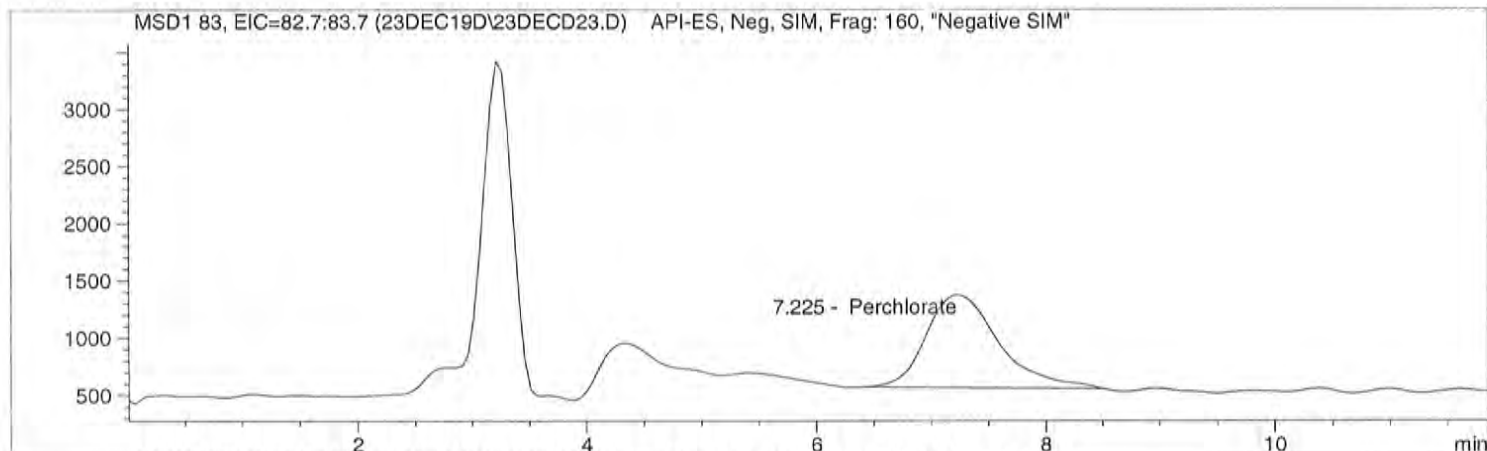
=====
*** End of Report ***
=====

Injection Date: 12/23/2019 13:17:14
Sample Name: 1935366001
Acq Operator: TNB

Seq Line: 23
Location: Vial 92
Inj. No.: 1
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis




```

=====
Injection Date: 12/23/2019 13:17:14      Seq Line:      23
Sample Name:   1935366001                Location:      Vial 92
Acq Operator:  TNB                       Inj. No.:     1
                                           Inj. Vol.:    35 µl
=====

```

```

Acq. Method:   CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:  11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:    1.000000
Dilution:      1.000000
Sample Amount: 0.000
=====

```

```

=====
                          LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.225	PBA	35581.3	0.5167	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.237	MM	14057.6	0.6080	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.284	PBA	226617.1	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

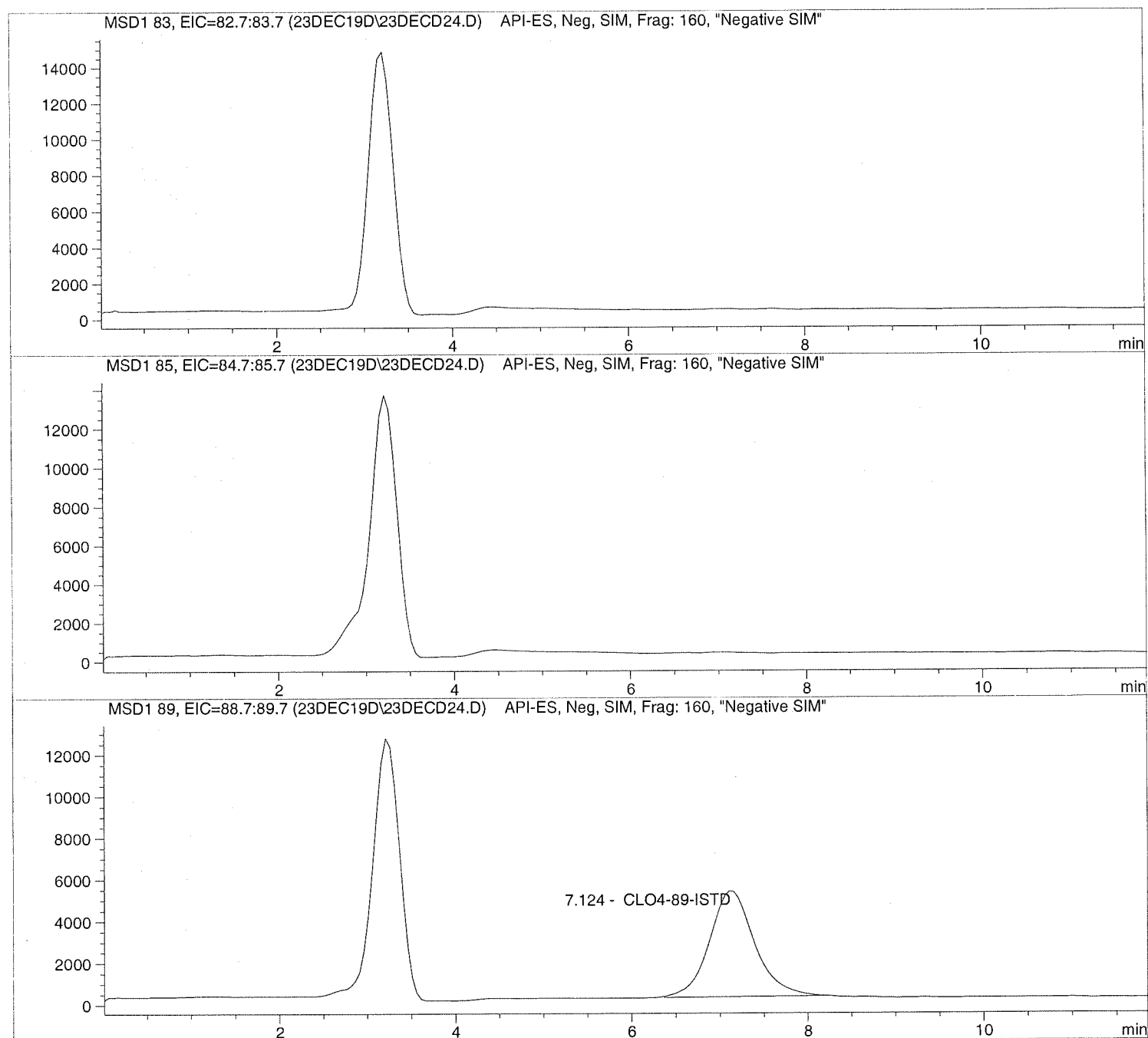
```

Data file: C:\HPCHEM\1\DATA\23DEC19D\23DECD24.D Sample Name: 1935345003 5X

```
=====
Injection Date: 12/23/2019 13:31:15      Seq Line:          24
Sample Name:    1935345003 5X             Location:          Vial 93
Acq Operator:   TNB                       Inj. No.:         1
                                           Inj. Vol.:        35 µl
=====
```

```
Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   11/5/2019 08:44:45
=====
```

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23DEC19D\23DECD24.D Sample Name: 1935345003 5X

```

=====
Injection Date: 12/23/2019 13:31:15      Seq Line:          24
Sample Name:   1935345003 5X             Location:          Vial 93
Acq Operator:  TNB                       Inj. No.:         1
                                           Inj. Vol.:        35 µl
=====

```

```

Acq. Method:   CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:  11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:    1.000000
Dilution:      5.000000
Sample Amount: 0.000
=====

```

```

=====
                          LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.124	BBA	180510.4	25.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

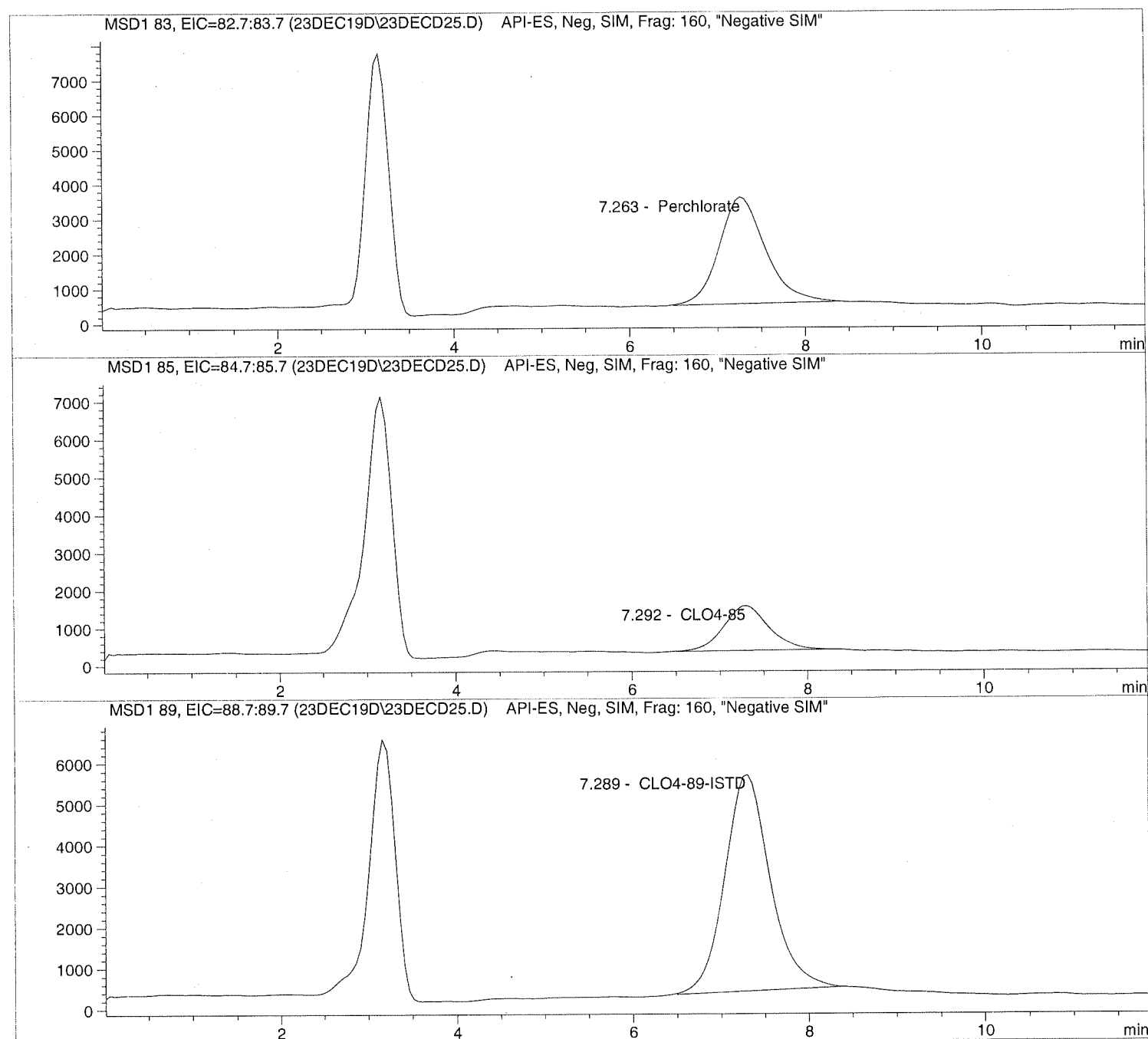
```

Data file: C:\HPCHEM\1\DATA\23DEC19D\23DECD25.D Sample Name: 1935345004 5X

```
=====
Injection Date: 12/23/2019 13:45:07      Seq Line:      25
Sample Name:    1935345004 5X             Location:      Vial 94
Acq Operator:   TNB                       Inj. No.:     1
                                           Inj. Vol.:    35 µl
=====
```

```
Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   11/5/2019 08:44:45
```

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23DEC19D\23DECD25.D Sample Name: 1935345004 5X

```

=====
Injection Date: 12/23/2019 13:45:07      Seq Line:      25
Sample Name:   1935345004 5X             Location:      Vial 94
Acq Operator:  TNB                       Inj. No.:     1
                                           Inj. Vol.:    35 µl
=====

```

```

Acq. Method:   CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:  11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:    1.000000
Dilution:      5.000000
Sample Amount: 0.000
=====

```

```

=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.263	BBA	112394.8	10.7958	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.292	BBA	42859.8	13.1155	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.289	BBA	190269.1	25.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\23DEC19D\23DECD26.D

Sample Name: 689415 CCV@25

Injection Date: 12/23/2019 13:59:13

Seq Line: 26

Sample Name: 689415 CCV@25

Location: Vial 71

Acq Operator: TNB 529

Inj. No.: 1

TB 12.30.19

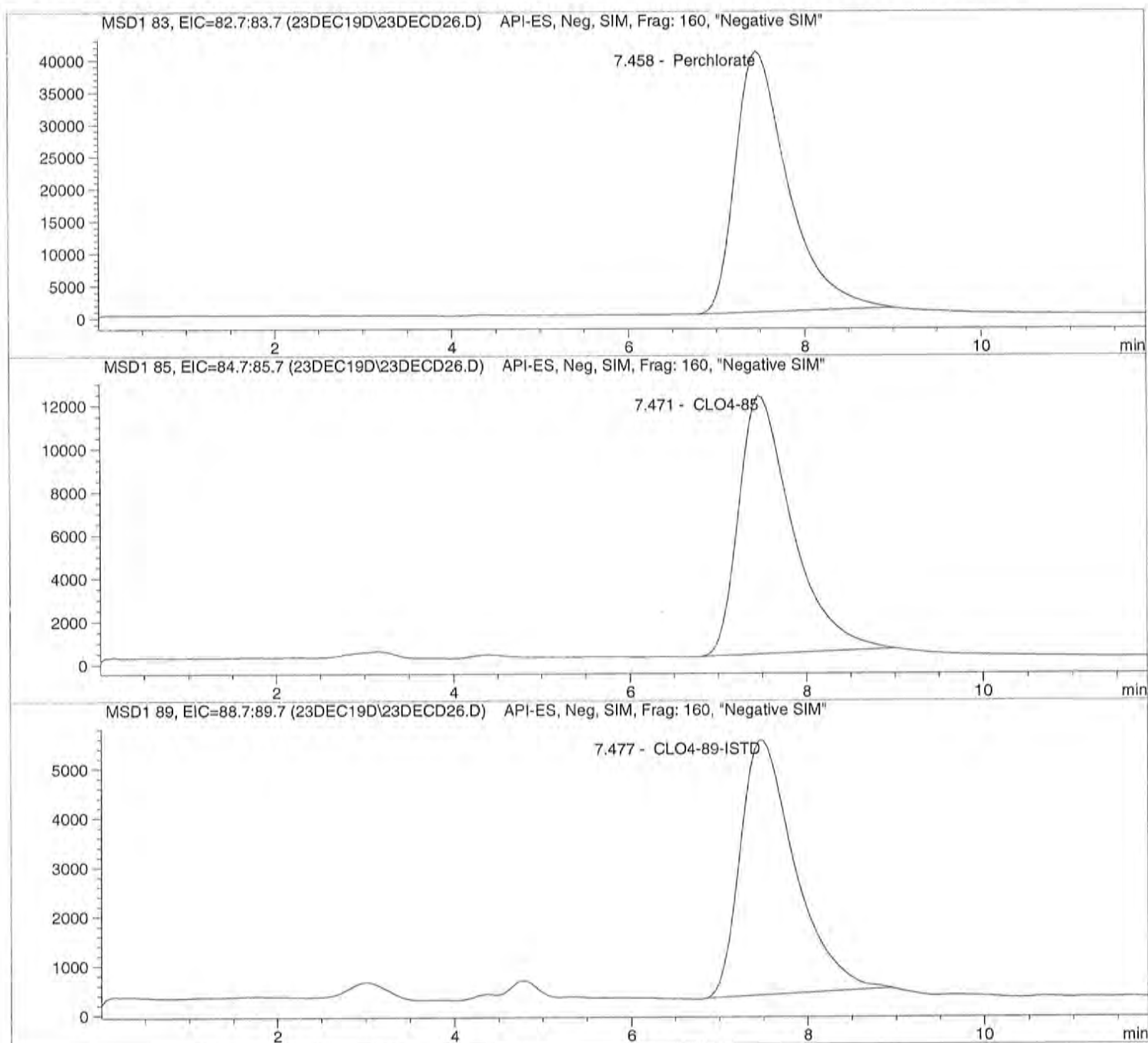
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M

Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23DEC19D\23DECD26.D Sample Name: 689415 CCV@25

```

=====
Injection Date: 12/23/2019 13:59:13      Seq Line:          26
Sample Name:    689415 CCV@25             Location:          Vial 71
Acq Operator:   TNB 529                    Inj. No.:         1
                                     TB 12.30.19      Inj. Vol.:        35 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:    1.000000
Dilution:      1.000000
Sample Amount: 25.000
=====

```

```

=====
                          LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.458	PBA	1673122.6	25.5598	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.471	PBA	503084.9	25.2394	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.477	PBA	223152.5	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

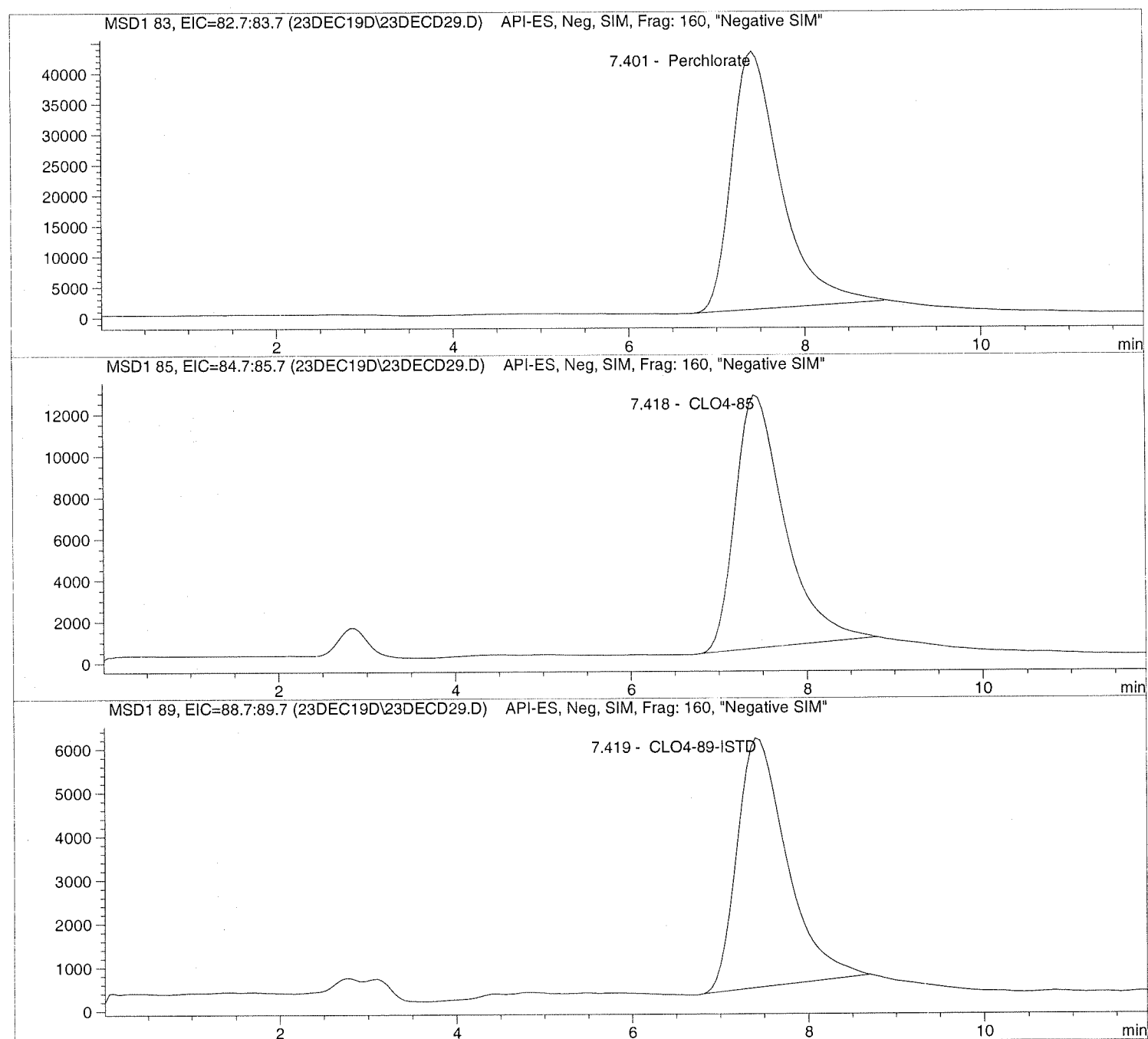
```

Data file: C:\HPCHEM\1\DATA\23DEC19D\23DECD29.D Sample Name: 1935347004 MS

```
=====
Injection Date: 12/23/2019 14:45:56      Seq Line:          29
Sample Name:    1935347004      MS      Location:         Vial 97
Acq Operator:   TNB              Inj. No.:         1
                                      Inj. Vol.:       35 µl
=====
```

```
Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   11/5/2019 08:44:45
=====
```

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23DEC19D\23DECD29.D Sample Name: 1935347004 MS

```

=====
Injection Date: 12/23/2019 14:45:56      Seq Line:          29
Sample Name:   1935347004 MS             Location:         Vial 97
Acq Operator:  TNB                       Inj. No.:        1
                                           Inj. Vol.:       35 µl
=====

```

```

Acq. Method:   CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:  11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:    1.000000
Dilution:      10.000000
Sample Amount: 0.000
=====

```

```

=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.401	PBA	1640825.4	249.9006	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.418	PBA	475545.6	238.5228	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.419	PBA	224360.6	50.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

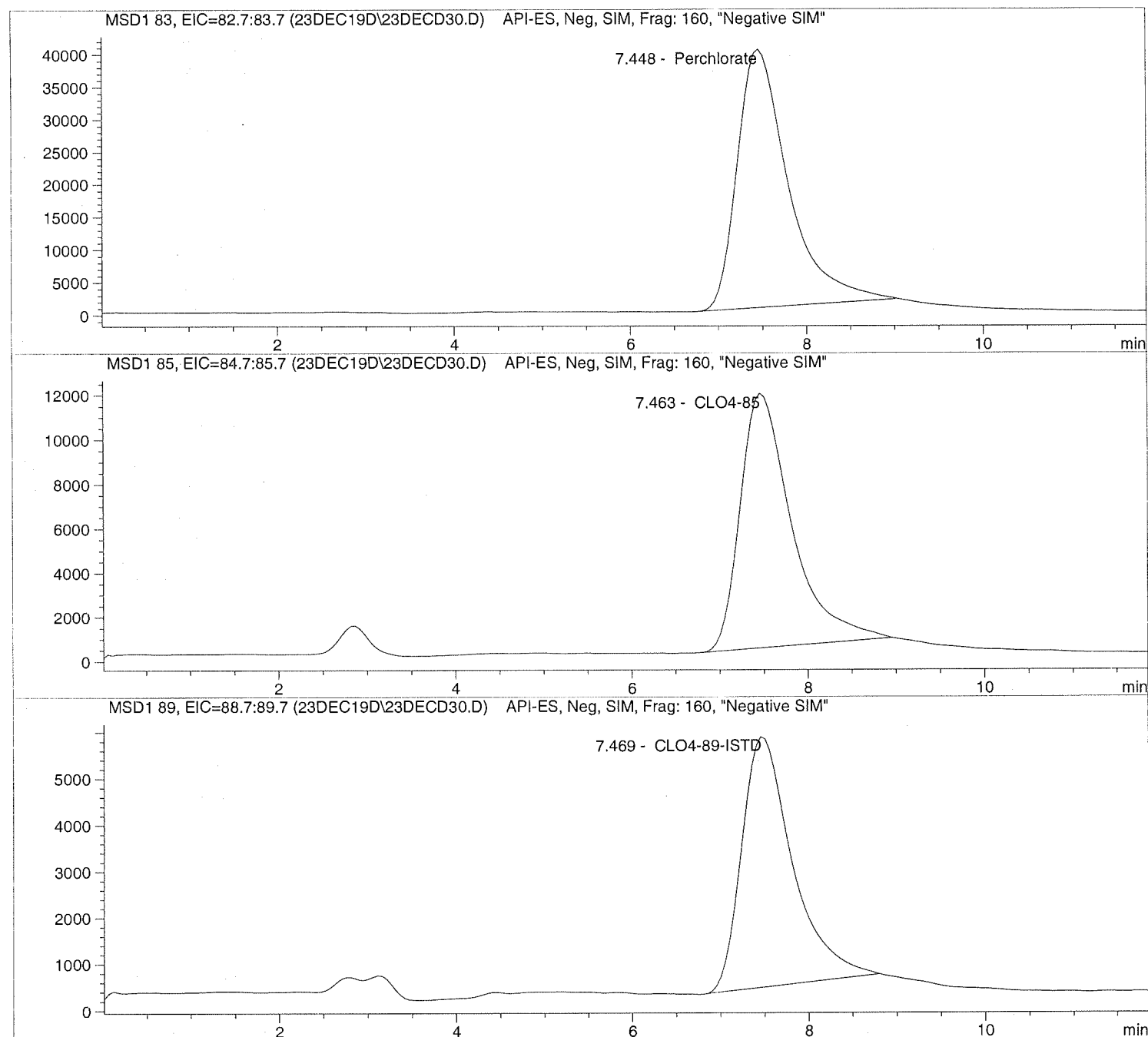
```

Data file: C:\HPCHEM\1\DATA\23DEC19D\23DECD30.D Sample Name: 1935347005 MSD

```
=====
Injection Date: 12/23/2019 14:59:48      Seq Line: 30
Sample Name: 1935347005 MSD              Location: Vial 98
Acq Operator: TNB                        Inj. No.: 1
                                           Inj. Vol.: 35 µl
=====
```

```
Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45
```

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23DEC19D\23DECD30.D Sample Name: 1935347005 MSD

```

=====
Injection Date: 12/23/2019 14:59:48      Seq Line:          30
Sample Name:   1935347005  MSD           Location:         Vial 98
Acq Operator:  TNB                      Inj. No.:        1
                                           Inj. Vol.:       35 µl
=====

```

```

Acq. Method:   CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:  11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       10.000000
Sample Amount:  0.000
=====

```

```

=====
                          LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.448	PBA	1589648.0	251.1209	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.463	PBA	464977.5	241.7384	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.469	PBA	216197.6	50.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

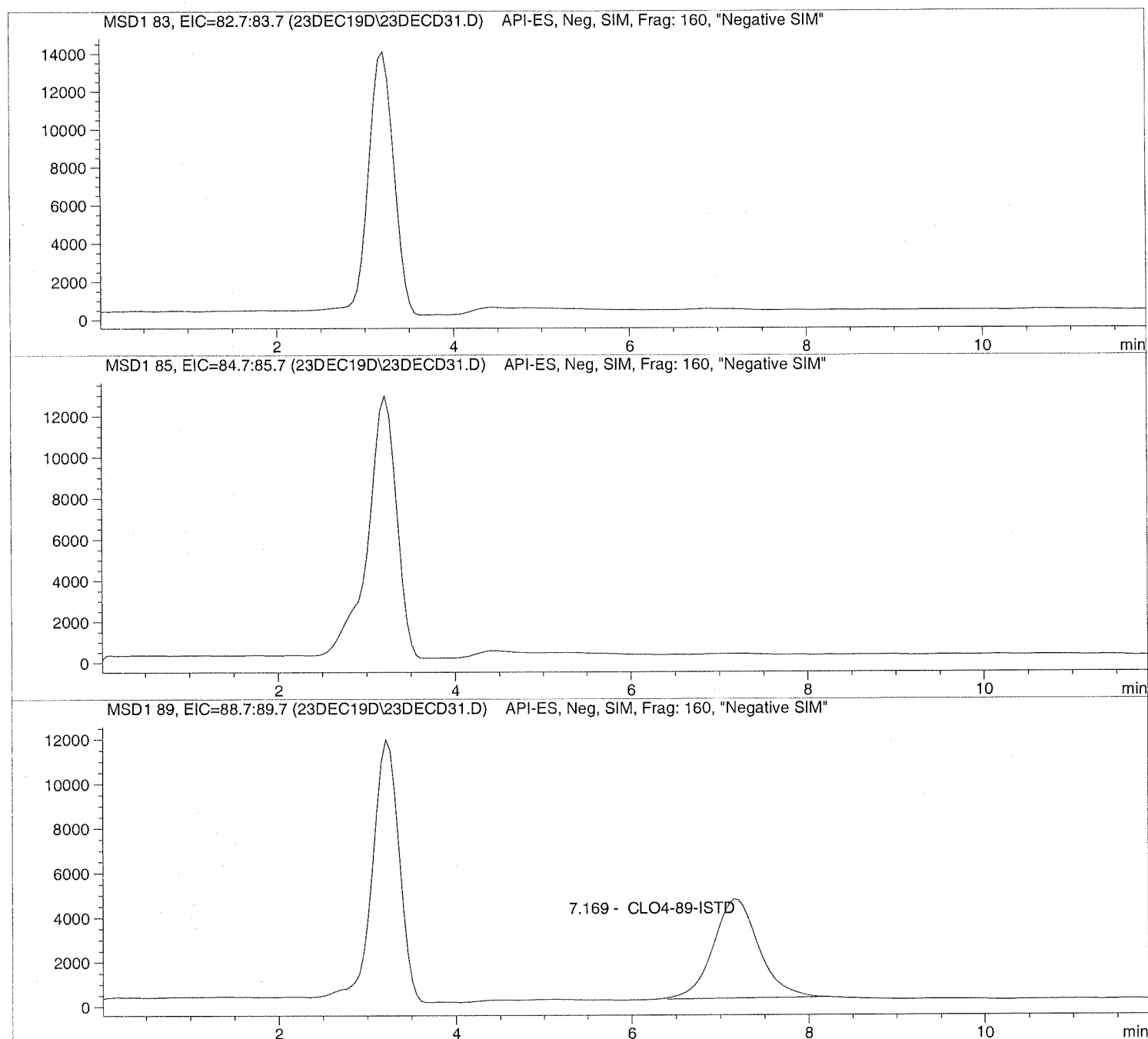
```

Data file: C:\HPCHEM\1\DATA\23DEC19D\23DECD31.D Sample Name: 1935345003 2X

```
=====
Injection Date: 12/23/2019 15:18:09      Seq Line:          31
Sample Name:    1935345003 2X            Location:          Vial 99
Acq Operator:   TNB                      Inj. No.:         1
                                           Inj. Vol.:        35 µl
=====
```

```
Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   11/5/2019 08:44:45
=====
```

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23DEC19D\23DECD31.D Sample Name: 1935345003 2X

```

=====
Injection Date: 12/23/2019 15:18:09      Seq Line:          31
Sample Name:   1935345003 2X             Location:          Vial 99
Acq Operator:  TNB                       Inj. No.:         1
                                           Inj. Vol.:        35 µl
=====

```

```

Acq. Method:   CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:  11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:    1.000000
Dilution:      2.000000
Sample Amount: 0.000
=====

```

```

=====
                          LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.169	BBA	159557.1	10.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

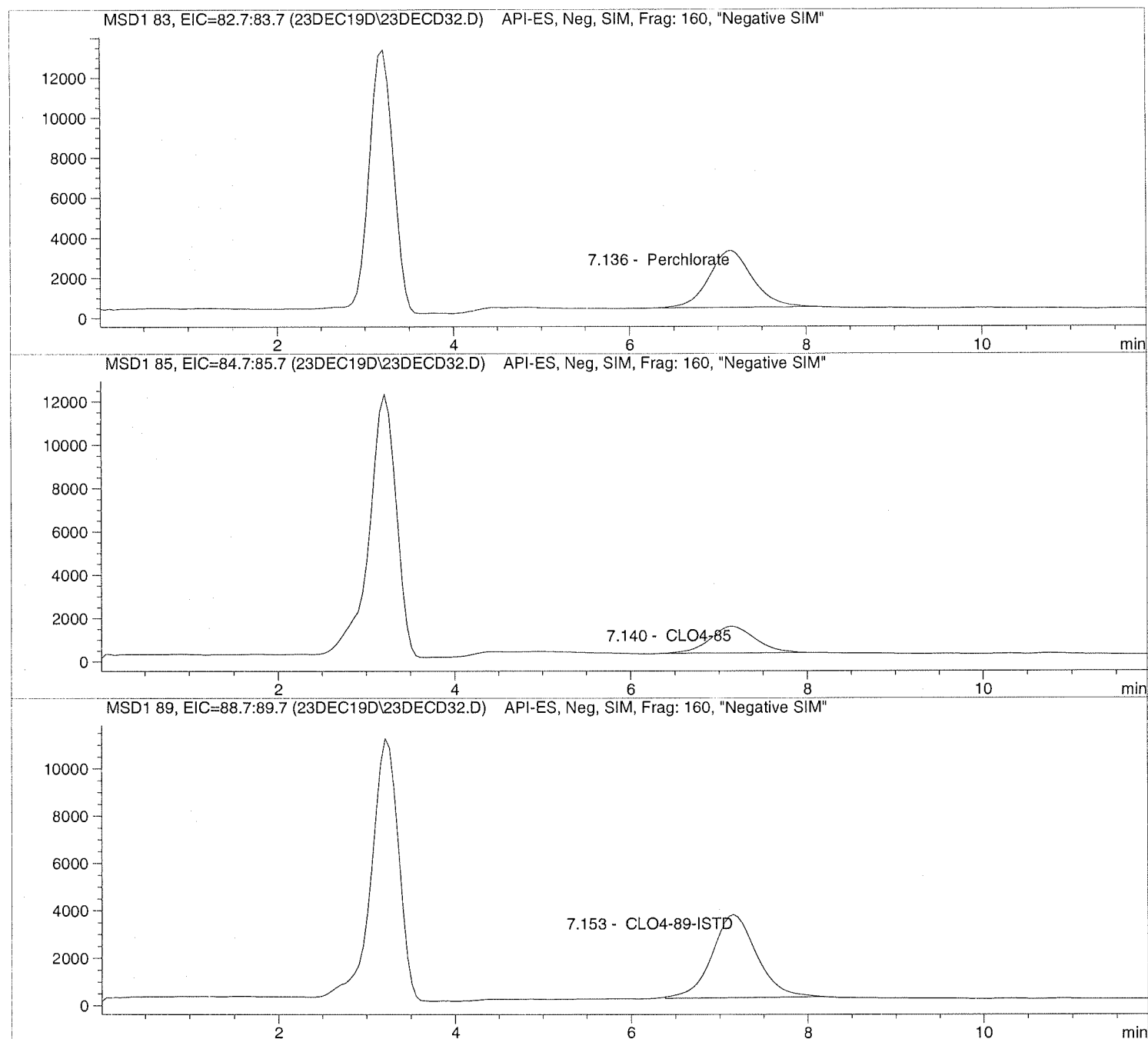
```

Data file: C:\HPCHEM\1\DATA\23DEC19D\23DECD32.D Sample Name: 1935345004 2X

```
=====
Injection Date: 12/23/2019 15:32:02      Seq Line:          32
Sample Name:    1935345004 2X            Location:         Vial 100
Acq Operator:   TNB                      Inj. No.:        1
                                           Inj. Vol.:       35 µl
=====
```

```
Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   11/5/2019 08:44:45
```

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23DEC19D\23DECD32.D Sample Name: 1935345004 2X

```

=====
Injection Date: 12/23/2019 15:32:02      Seq Line:          32
Sample Name:   1935345004 2X             Location:         Vial 100
Acq Operator:  TNB                       Inj. No.:        1
                                           Inj. Vol.:       35 µl
=====

```

```

Acq. Method:   CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:  11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:    1.000000
Dilution:      2.000000
Sample Amount: 0.000
=====

```

```

=====
                          LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.136	BBA	97613.7	5.8383	Perchlorate

Not REPORTED

83/85 RATIO FAILS

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.140	PBA	44068.5	8.4799	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.153	BBA	122991.7	10.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\23DEC19D\23DECD33.D

Sample Name: 689664 CCV025

Injection Date: 12/23/2019 15:46:07

Seq Line: 33

Sample Name: 689664 CCV025

Location: Vial 71

Acq Operator: TNB

Inj. No.: 1

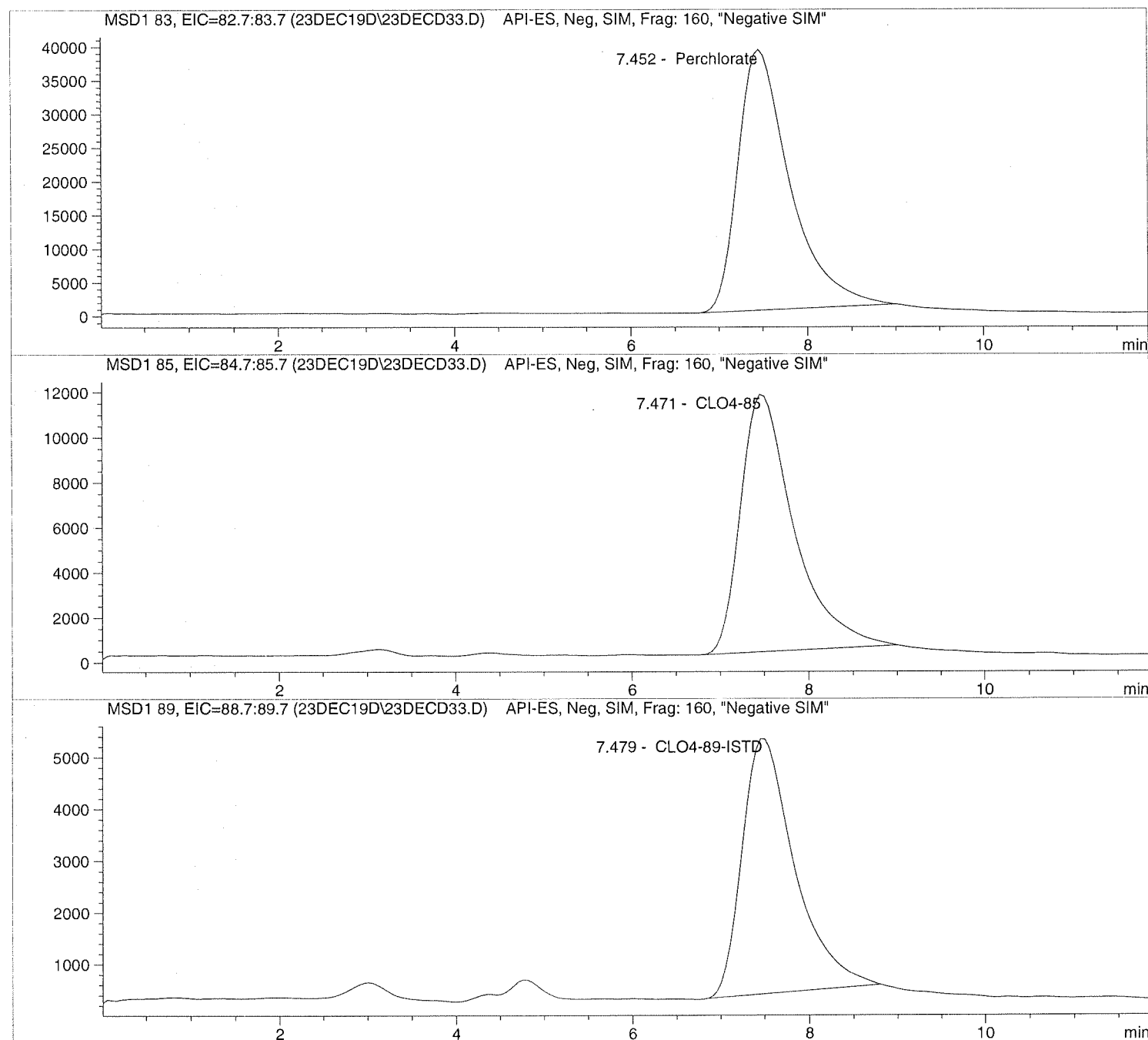
Inj. Vol.: 35 µl

Acq. Method: CL04-AQN.M

Analysis Method: C:\HPCHEM\1\METHODS\CL04-DP3.M

Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23DEC19D\23DECD33.D Sample Name: 689664 CCV@25

```

=====
Injection Date: 12/23/2019 15:46:07      Seq Line:          33
Sample Name:    689664    CCV@25          Location:          Vial 71
Acq Operator:   TNB                               Inj. No.:         1
                                                Inj. Vol.:        35 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   11/5/2019 08:44:45
=====

```

Perchlorate analysis

Sample Information

```

=====
Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:    1.000000
Dilution:      1.000000
Sample Amount: 25.000
=====

```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.452	PBA	1578778.2	26.3191	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.471	PBA	478131.8	26.1673	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.479	PBA	203856.7	5.0000	CLO4-89-ISTD

*** End of Report ***



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Initial Calibration

=====
 Calibration Table
 =====

Perchlorate

Calib. Data Modified : 9/23/2019 12:20:59 PM

Calculate : Internal Standard
 Based on : Peak Area

Rel. Reference Window : 20.000 %
 Abs. Reference Window : 0.000 min
 Rel. Non-ref. Window : 20.000 %
 Abs. Non-ref. Window : 0.000 min

Use Multiplier & Dilution Factor with ISTDs

Uncalibrated Peaks : not reported
 Partial Calibration : No recalibration if peaks missing

Curve Type : Quadratic (some peaks differ, see below)
 Origin : Ignored (some peaks differ, see below)
 Weight : Linear (Amnt) (some peaks differ, see below)

Recalibration Settings:
 Average Response : Average all calibrations
 Average Retention Time: Floating Average New 75%

Calibration Report Options :
 Printout of recalibrations within a sequence:
 Calibration Table after Recalibration
 Normal Report after Recalibration
 If the sequence is done with bracketing:
 Results of first cycle (ending previous bracket)

Default Sample ISTD Information (if not set in sample table):

ISTD #	ISTD Amount	Name
1	5.00000	CLO4-89-ISTD

Signal 1: MSD1 83, EIC=82.7:83.7
 Signal 2: MSD1 85, EIC=84.7:85.7
 Signal 3: MSD1 89, EIC=88.7:89.7

RetTime [min]	Lvl	Amount	Area	Amt/Area	Ref	Grp Name
7.750	1 3	1.00000	5.39218e4	1.85454e-5	1	Perchlorate
	4	2.00000	1.32825e5	1.50574e-5		
	5	5.00000	2.76271e5	1.80982e-5		
	6	10.00000	5.61298e5	1.78159e-5		
	7	25.00000	1.51820e6	1.64669e-5		
	8	50.00000	3.31156e6	1.50986e-5		
	9	75.00000	5.23914e6	1.43153e-5		
7.767	3 3	5.00000	2.14568e5	2.33026e-5	+I1	CLO4-89-ISTD
	4	5.00000	2.04758e5	2.44190e-5		
	5	5.00000	2.13407e5	2.34294e-5		
	6	5.00000	2.09246e5	2.38953e-5		
	7	5.00000	2.07403e5	2.41077e-5		
	8	5.00000	2.02929e5	2.46391e-5		
	9	5.00000	1.97933e5	2.52611e-5		
7.778	2 3	1.00000	1.70436e4	5.86732e-5	1	CLO4-85
	4	2.00000	4.20754e4	4.75337e-5		
	5	5.00000	9.24707e4	5.40712e-5		
	6	10.00000	1.68622e5	5.93041e-5		
	7	25.00000	4.63724e5	5.39114e-5		
	8	50.00000	9.95933e5	5.02042e-5		

RetTime [min]	Lvl Sig	Amount	Area	Amt/Area	Ref Grp Name
	9	75.00000	1.58066e6	4.74484e-5	

More compound-specific settings:

Compound: Perchlorate

Time Window : From 3.581 min To 11.899 min
 Curve Type : Quadratic
 Origin : Ignored
 Calibration Level Weights:/
 Level 3 : 1
 Level 4 : 0.5
 Level 5 : 0.2
 Level 6 : 0.1
 Level 7 : 0.04
 Level 8 : 0.02
 Level 9 : 0.013333

Compound: CLO4-89-ISTD

Time Window : From 3.581 min To 11.896 min
 Curve Type : Linear
 Origin : Included
 Calibration Level Weights:/
 Level 3 : 1
 Level 4 : 1
 Level 5 : 1
 Level 6 : 1
 Level 7 : 1
 Level 8 : 1
 Level 9 : 1

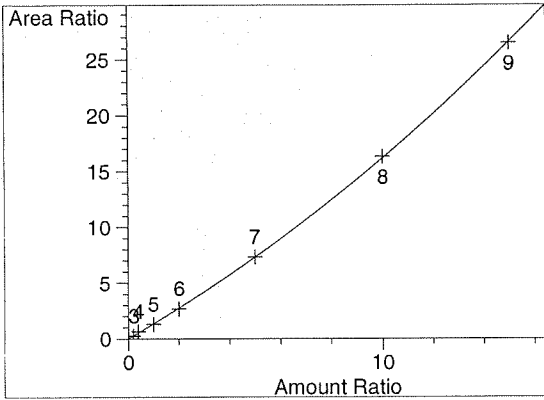
Compound: CLO4-85

Time Window : From 3.601 min To 11.913 min
 Curve Type : Quadratic
 Origin : Ignored
 Calibration Level Weights:/
 Level 3 : 1
 Level 4 : 0.5
 Level 5 : 0.2
 Level 6 : 0.1
 Level 7 : 0.04
 Level 8 : 0.02
 Level 9 : 0.013333

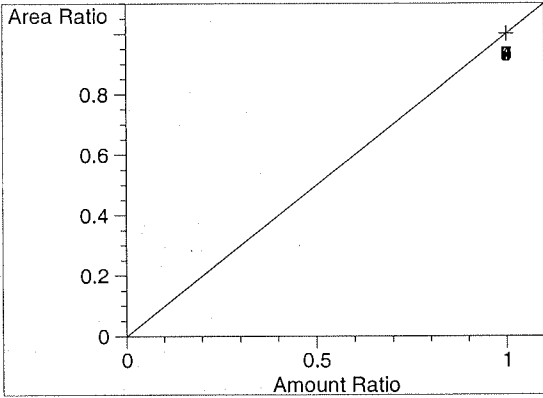
=====
 Peak Sum Table
 =====

No Entries in table
 =====

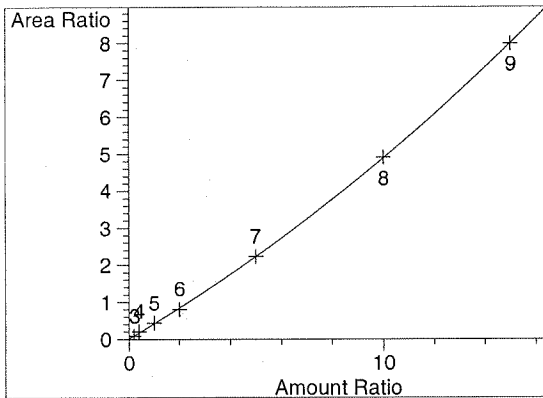
=====
 Calibration Curves
 =====



Perchlorate at exp. RT: 7.750
 MSD1 83, EIC=82.7:83.7
 Correlation: 0.99975
 Residual Std. Dev.: 0.10284
 Formula: $y = ax^2 + bx + c$
 a: 3.10463e-2
 b: 1.30369
 c: 2.19496e-2
 x: Amount Ratio
 y: Area Ratio
 Calibration Level Weights:
 Level 3 : 1
 Level 4 : 0.5
 Level 5 : 0.2
 Level 6 : 0.1
 Level 7 : 0.04
 Level 8 : 0.02
 Level 9 : 0.013333



CLO4-89-ISTD at exp. RT: 7.767
 MSD1 89, EIC=88.7:89.7
 Correlation: 1.00000
 Residual Std. Dev.: 0.00000
 Formula: $y = mx + b$
 m: 1.00000
 b: 0.00000
 x: Amount Ratio
 y: Area Ratio
 Calibration Level Weights:
 Level 3 : 1
 Level 4 : 1
 Level 5 : 1
 Level 6 : 1
 Level 7 : 1
 Level 8 : 1
 Level 9 : 1



CLO4-85 at exp. RT: 7.778
 MSD1 85, EIC=84.7:85.7
 Correlation: 0.99969
 Residual Std. Dev.: 0.02601
 Formula: $y = ax^2 + bx + c$
 a: 8.85207e-3
 b: 3.99283e-1
 c: 1.33505e-2
 x: Amount Ratio
 y: Area Ratio
 Calibration Level Weights:
 Level 3 : 1
 Level 4 : 0.5
 Level 5 : 0.2
 Level 6 : 0.1
 Level 7 : 0.04
 Level 8 : 0.02
 Level 9 : 0.013333

Batch Review Method:

C:\HPCHEM\1\METHODS\CLO4-DP3.M

['#' ==> Run has not been reprocessed with Batch Review Method

['*' ==> Run has been saved with batch file]

#*	Sample	Location	Inj	SampleType	Run	Perchlorate Area	Perchlorat RT	Perchlorate Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	5.39218e4	7.750	8.75982e-1
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	1.32825e5	7.797	2.37682
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	2.76271e5	7.770	4.77237
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	5.61298e5	7.785	9.75097
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	1.51820e6	7.741	25.01082
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	3.31156e6	7.775	50.40300
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	5.23914e6	7.736	74.79107
#*	ICAL Verf@10ug/L	Vial 80	1	Control	11	5.74879e5	7.756	10.11855

#*	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	2.14568e5	7.767	5.00000
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	2.04758e5	7.816	5.00000
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	2.13407e5	7.793	5.00000
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	2.09246e5	7.798	5.00000
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	2.07403e5	7.763	5.00000
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	2.02929e5	7.800	5.00000
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	1.97933e5	7.765	5.00000
#*	ICAL Verf@10ug/L	Vial 80	1	Control	11	2.06243e5	7.776	5.00000

#*	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	1.70436e4	7.778	8.24488e-1
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	4.20754e4	7.805	2.38090
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	9.24707e4	7.787	5.14166
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	1.68622e5	7.781	9.52209
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	4.63724e5	7.760	25.04916
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	9.95933e5	7.793	50.14223
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	1.58066e6	7.758	74.93659
#*	ICAL Verf@10ug/L	Vial 80	1	Control	11	1.71000e5	7.760	9.79043

*** End of Report ***

Sequence Table:

Method and Injection Info Part:

Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
====	=====	=====	=====	===	=====	=====	=====
1	Vial 71	CLO4@ 0.2ug/L	CLO4-AQN	1	Ctrl Samp		
2	Vial 72	CLO4@ 0.5ug/L	CLO4-AQN	1	Ctrl Samp		
3	Vial 73	CLO4@ 1.0ug/L	CLO4-AQN	1	Ctrl Samp		
4	Vial 74	CLO4@ 2.0ug/L	CLO4-AQN	1	Ctrl Samp		
5	Vial 75	CLO4@ 5.0ug/L	CLO4-AQN	1	Ctrl Samp		
6	Vial 76	CLO4@ 10.ug/L	CLO4-AQN	1	Ctrl Samp		
7	Vial 77	CLO4@ 25.ug/L	CLO4-AQN	1	Ctrl Samp		
8	Vial 78	CLO4@ 50.ug/L	CLO4-AQN	1	Ctrl Samp		
9	Vial 79	CLO4@ 75.ug/L	CLO4-AQN	1	Ctrl Samp		
10	Vial 71	CLO4@ 0.2ug/L	CLO4-AQN	1	Ctrl Samp		
11	Vial 80	ICAL Verf@10ug/L	CLO4-AQN	1	Ctrl Samp		

Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI03.D

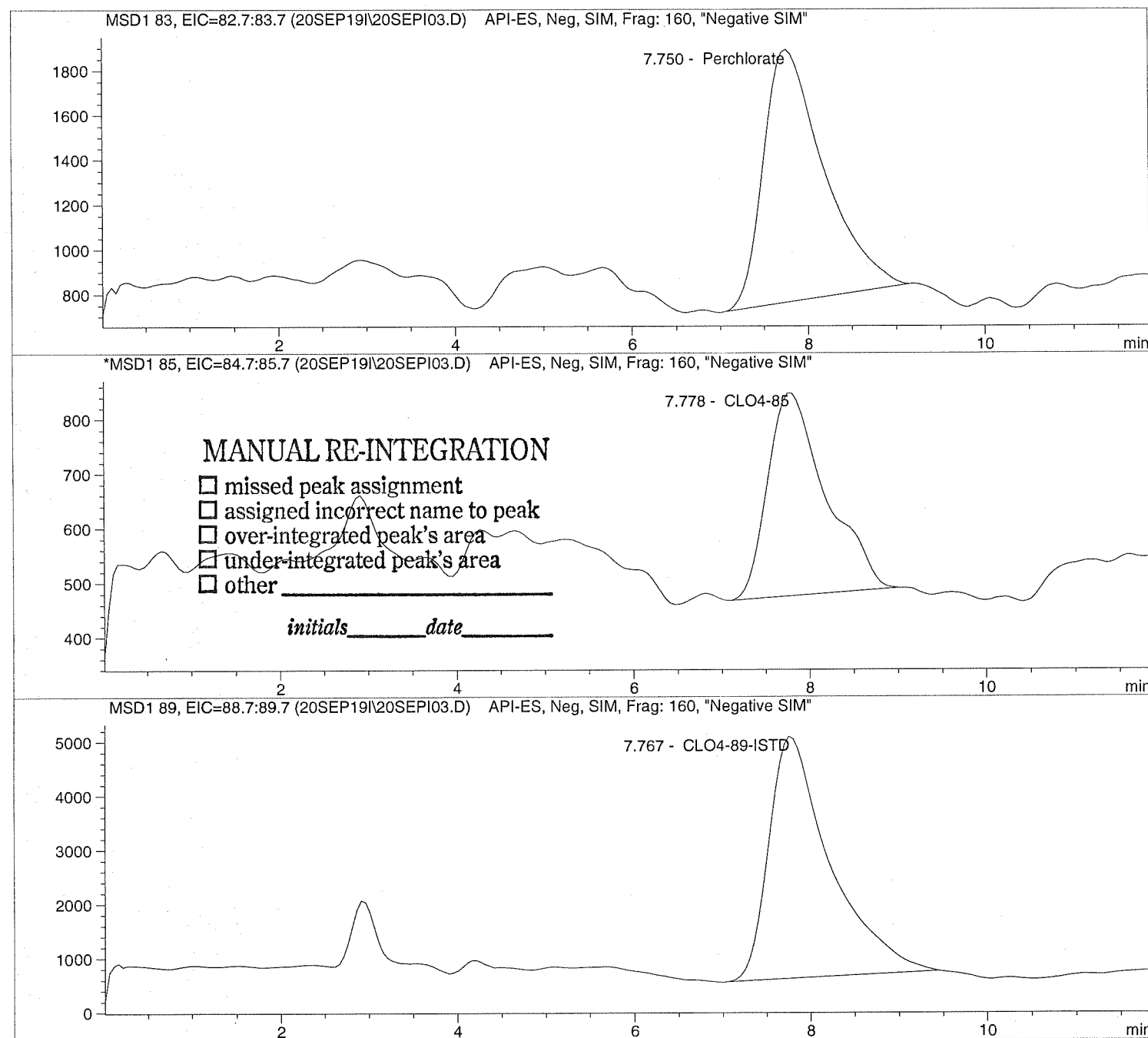
Sample Name: CLO4@ 1.0ug/L

Injection Date: 9/20/2019 09:24:05
 Sample Name: CLO4@ 1.0ug/L
 Acq Operator: TNB

Seq Line: 3
 Location: Vial 73
 Inj. No.: 1
 Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M
 Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
 Last Changed: 9/23/2019 12:21:47

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI03.D Sample Name: CLO4@ 1.0ug/L

```

=====
Injection Date: 9/20/2019 09:24:05      Seq Line:          3
Sample Name:    CLO4@ 1.0ug/L           Location:         Vial 73
Acq Operator:   TNB                     Inj. No.:        1
                                           Inj. Vol.:       30 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   9/23/2019 12:21:47
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  1.000
=====

```

```

=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.750	PBA	53921.8	0.8760	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.778	MM	17043.6	0.8245	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.767	PBA	214568.1	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI04.D

Sample Name: CLO4@ 2.0ug/L

Injection Date: 9/20/2019 09:37:58

Seq Line: 4

Sample Name: CLO4@ 2.0ug/L

Location: Vial 74

Acq Operator: TNB

Inj. No.: 1

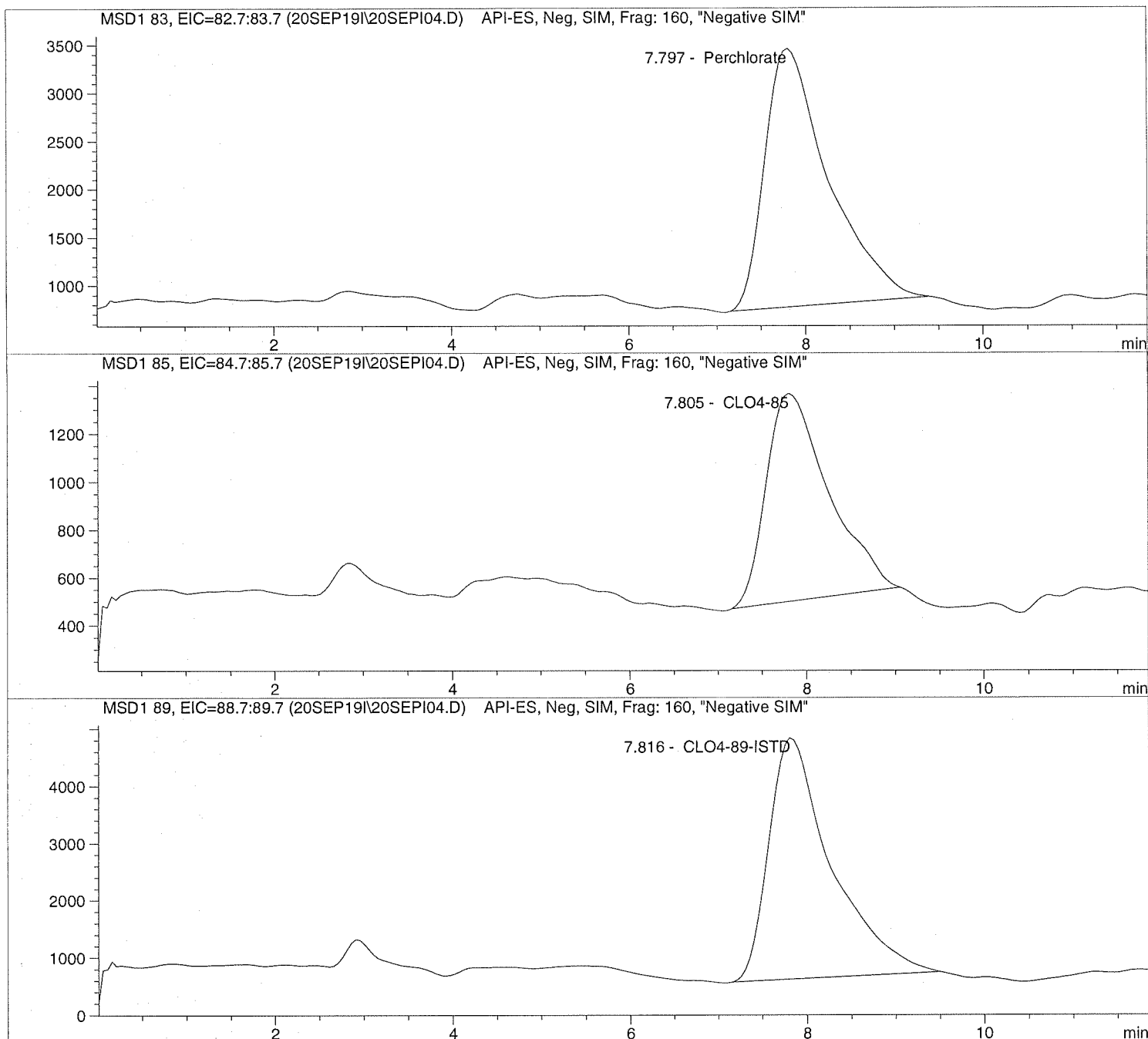
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M

Last Changed: 9/23/2019 12:21:47

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI04.D Sample Name: CLO4@ 2.0ug/L

```

=====
Injection Date: 9/20/2019 09:37:58      Seq Line:      4
Sample Name:   CLO4@ 2.0ug/L           Location:      Vial 74
Acq Operator:  TNB                     Inj. No.:     1
                                           Inj. Vol.:    30 µl
=====

```

```

Acq. Method:   CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:  9/23/2019 12:21:47
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:    1.000000
Dilution:      1.000000
Sample Amount: 2.000
=====

```

```

=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.797	PBA	132825.2	2.3768	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.805	PBA	42075.4	2.3809	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.816	PBA	204758.3	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

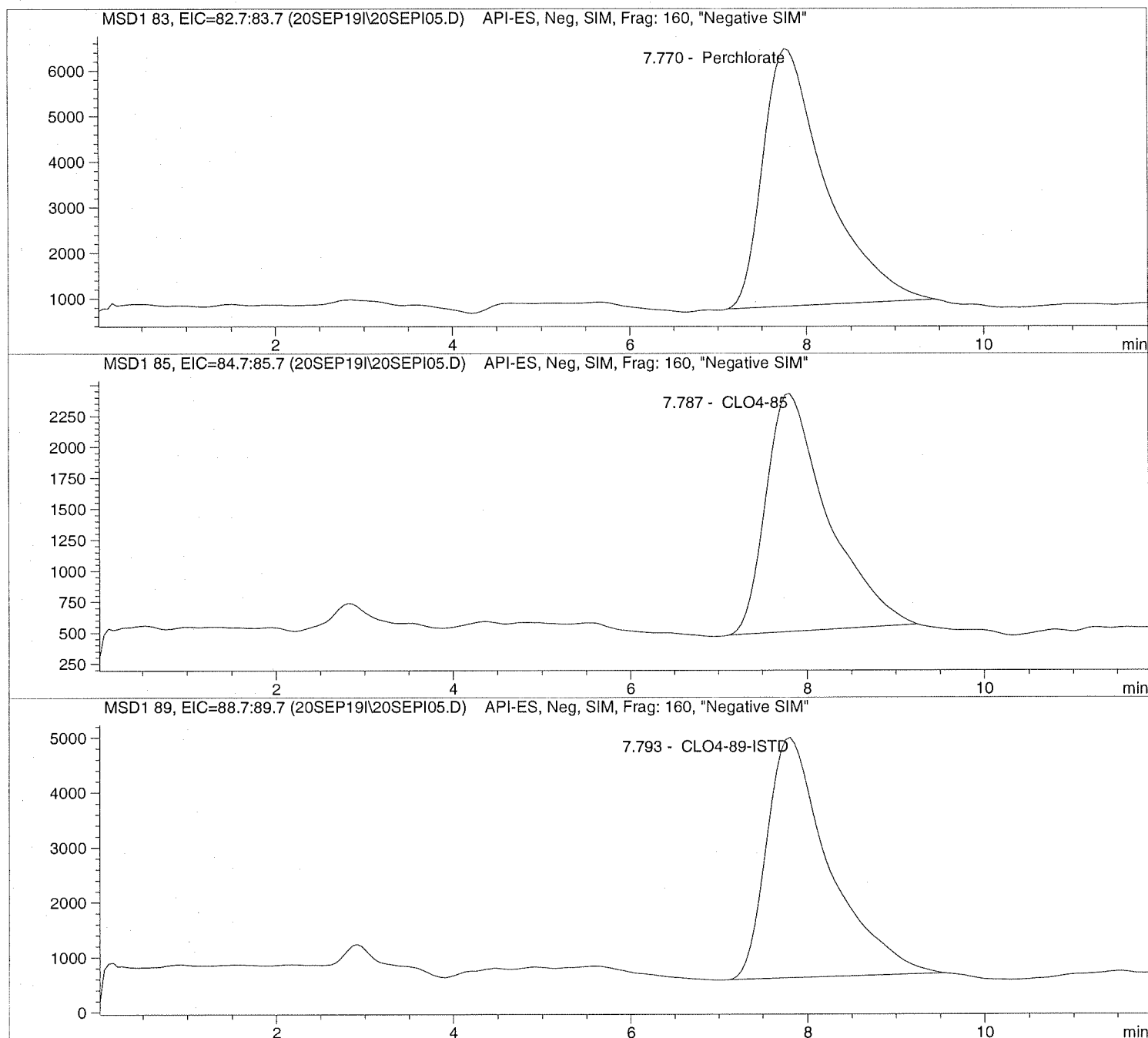
```

Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI05.D Sample Name: CLO4@ 5.0ug/L

```
=====
Injection Date: 9/20/2019 09:51:49      Seq Line: 5
Sample Name: CLO4@ 5.0ug/L              Location: Vial 75
Acq Operator: TNB                       Inj. No.: 1
                                           Inj. Vol.: 30 µl
=====
```

```
Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:21:47
```

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI05.D Sample Name: CLO4@ 5.0ug/L

```

=====
Injection Date: 9/20/2019 09:51:49      Seq Line: 5
Sample Name:    CLO4@ 5.0ug/L           Location:  Vial 75
Acq Operator:   TNB                     Inj. No.: 1
                                           Inj. Vol.: 30 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   9/23/2019 12:21:47
=====

```

Perchlorate analysis

Sample Information

```

=====
Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  5.000
=====

```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.770	PBA	276270.7	4.7724	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.787	PBA	92470.7	5.1417	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.793	PBA	213407.0	5.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI06.D

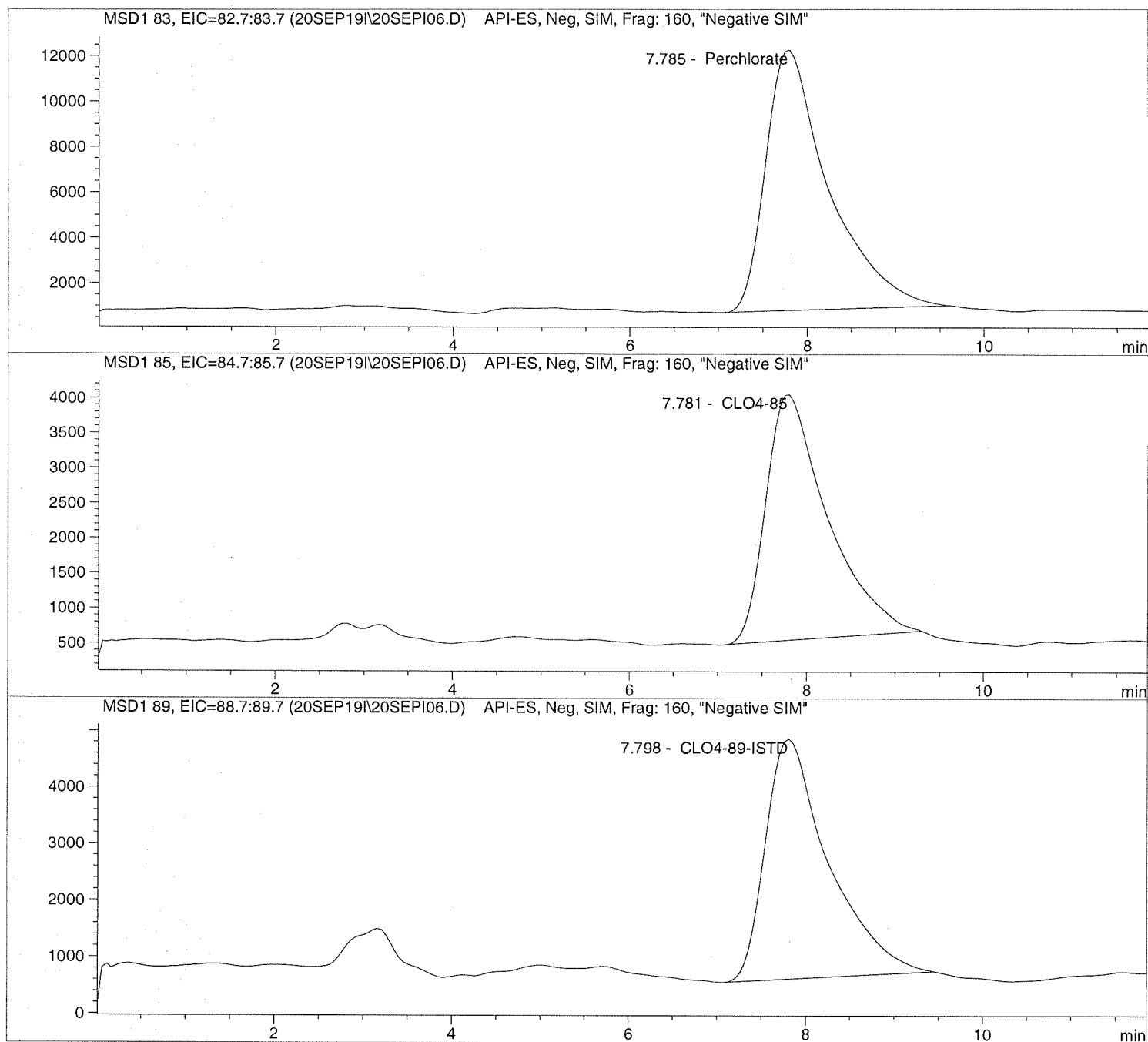
Sample Name: CLO4@ 10.ug/L

Injection Date: 9/20/2019 10:05:36
Sample Name: CLO4@ 10.ug/L
Acq Operator: TNB

Seq Line: 6
Location: Vial 76
Inj. No.: 1
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:21:47

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI06.D Sample Name: CLO4@ 10.ug/L

```

=====
Injection Date: 9/20/2019 10:05:36      Seq Line: 6
Sample Name:    CLO4@ 10.ug/L           Location:  Vial 76
Acq Operator:   TNB                     Inj. No.: 1
                                           Inj. Vol.: 30 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   9/23/2019 12:21:47
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  10.000
=====

```

```

=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.785	PBA	561297.7	9.7510	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.781	PBA	168622.4	9.5221	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.798	PBA	209246.3	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI07.D

Sample Name: CLO4@ 25.ug/L

Injection Date: 9/20/2019 10:19:23

Seq Line: 7

Sample Name: CLO4@ 25.ug/L

Location: Vial 77

Acq Operator: TNB

Inj. No.: 1

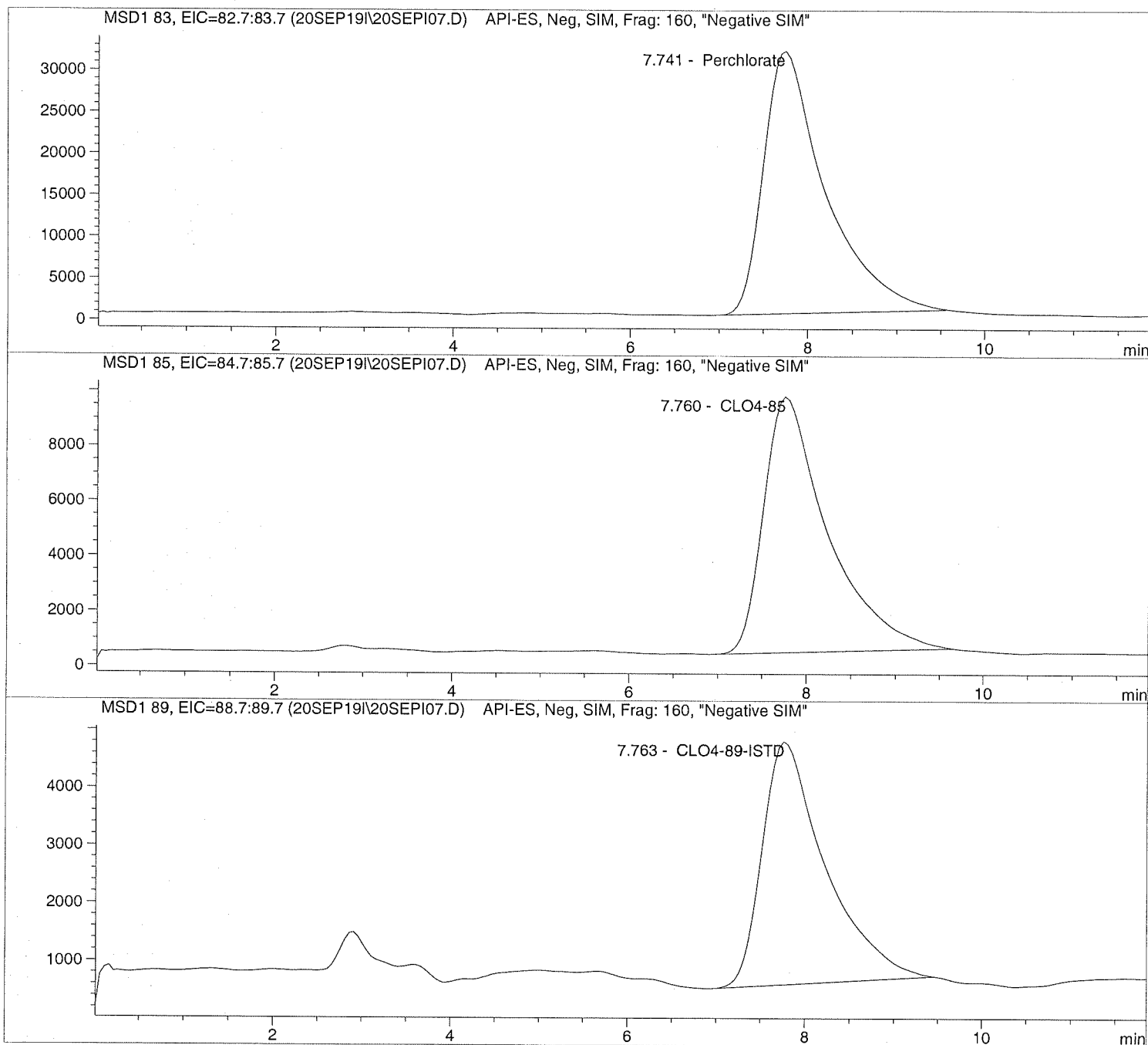
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M

Last Changed: 9/23/2019 12:21:47

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI07.D Sample Name: CLO4@ 25.ug/L

```

=====
Injection Date: 9/20/2019 10:19:23      Seq Line: 7
Sample Name:    CLO4@ 25.ug/L           Location:  Vial 77
Acq Operator:  TNB                      Inj. No.: 1
                                           Inj. Vol.: 30 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   9/23/2019 12:21:47
=====

```

Perchlorate analysis

Sample Information

```

=====
Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:    1.000000
Dilution:      1.000000
Sample Amount: 25.000
=====

```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.741	PBA	1518197.9	25.0108	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.760	PBA	463724.0	25.0492	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.763	PBA	207402.8	5.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI08.D

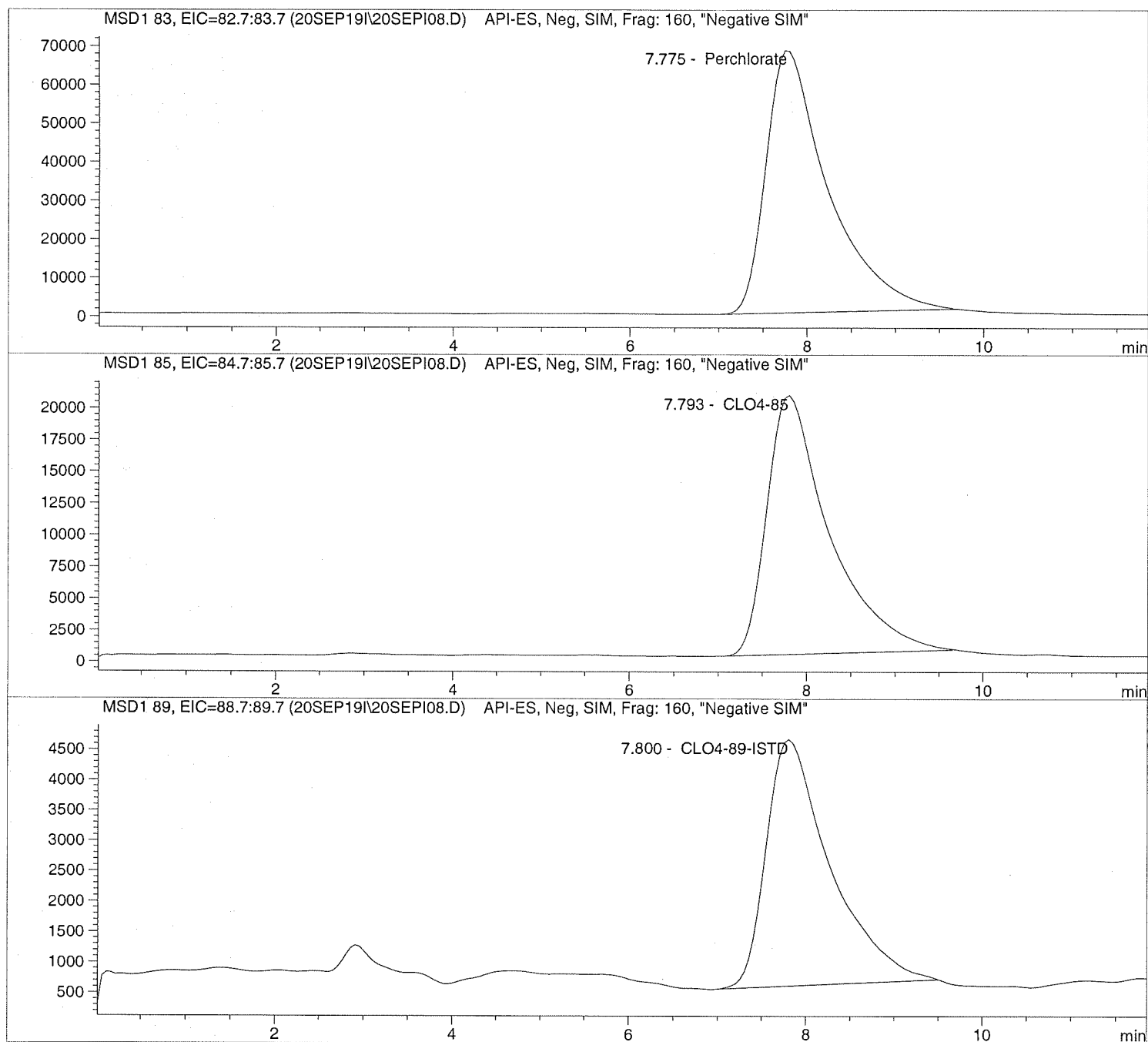
Sample Name: CLO4@ 50.ug/L

Injection Date: 9/20/2019 10:33:18
Sample Name: CLO4@ 50.ug/L
Acq Operator: TNB

Seq Line: 8
Location: Vial 78
Inj. No.: 1
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:21:47

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI08.D Sample Name: CLO4@ 50.ug/L

```

=====
Injection Date: 9/20/2019 10:33:18      Seq Line:      8
Sample Name:   CLO4@ 50.ug/L           Location:      Vial 78
Acq Operator:  TNB                     Inj. No.:     1
                                           Inj. Vol.:    30 µl
=====

```

```

Acq. Method:   CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:  9/23/2019 12:21:47
=====

```

Perchlorate analysis

Sample Information

```

=====
Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:    1.000000
Dilution:      1.000000
Sample Amount: 50.000
=====

```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.775	PBA	3311559.2	50.4030	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.793	PBA	995933.0	50.1422	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.800	PBA	202929.2	5.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI09.D

Sample Name: CLO4@ 75.ug/L

Injection Date: 9/20/2019 10:47:05

Seq Line: 9

Sample Name: CLO4@ 75.ug/L

Location: Vial 79

Acq Operator: TNB

Inj. No.: 1

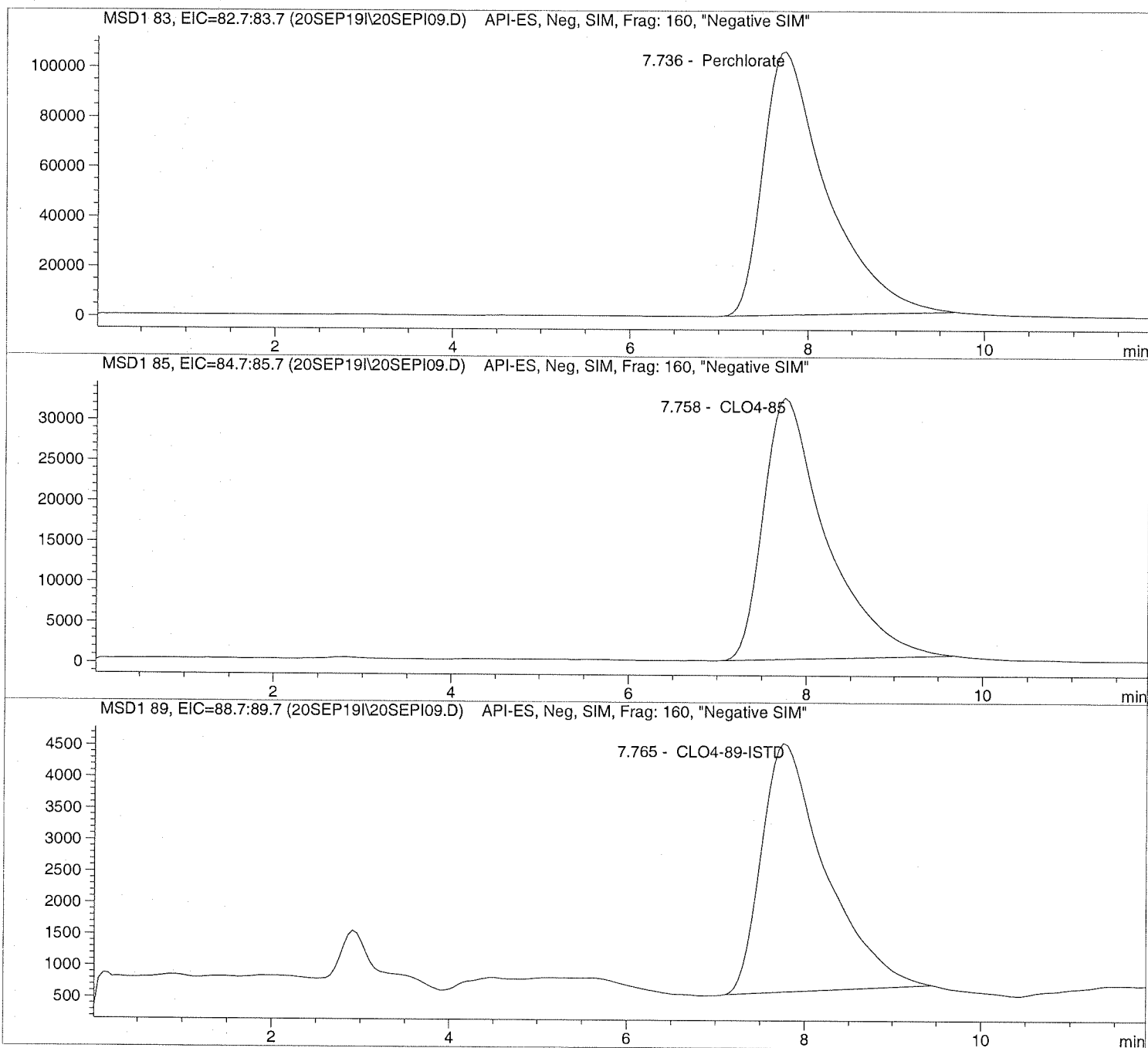
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M

Last Changed: 9/23/2019 12:21:47

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI09.D

Sample Name: CLO4@ 75.ug/L

```

=====
Injection Date: 9/20/2019 10:47:05      Seq Line: 9
Sample Name:    CLO4@ 75.ug/L           Location:  Vial 79
Acq Operator:  TNB                      Inj. No.: 1
                                           Inj. Vol.: 30 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   9/23/2019 12:21:47
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:      1.000000
Sample Amount:  75.000
=====

```

```

=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.736	PBA	5239145.0	74.7911	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.758	PBA	1580664.2	74.9366	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.765	PBA	197932.5	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\20SEP19\20SEPI11.D

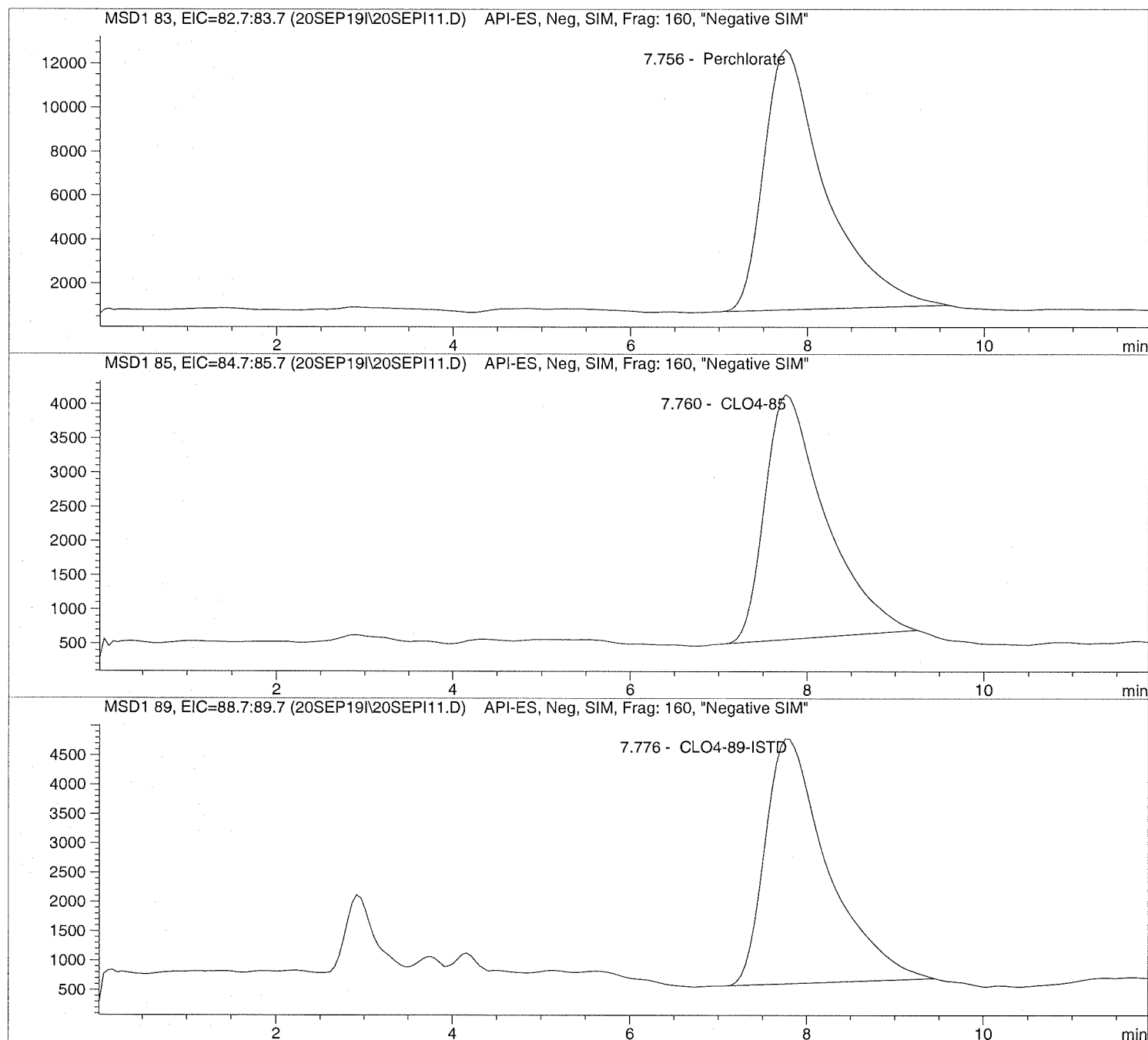
Sample Name: ICAL Verf@10ug/L

Injection Date: 9/20/2019 11:14:45
Sample Name: ICAL Verf@10ug/L
Acq Operator: TNB

Seq Line: 11
Location: Vial 80
Inj. No.: 1
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:21:47

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI11.D Sample Name: ICAL Verf@10ug/L

```

=====
Injection Date: 9/20/2019 11:14:45      Seq Line: 11
Sample Name:    ICAL Verf@10ug/L        Location:  Vial 80
Acq Operator:  TNB                      Inj. No.: 1
                                           Inj. Vol.: 30 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   9/23/2019 12:21:47
=====

```

Perchlorate analysis

Sample Information

```

=====
Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:    1.000000
Dilution:     1.000000
Sample Amount: 10.000
=====

```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.756	PBA	574879.4	10.1185	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.760	PBA	171000.4	9.7904	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.776	PBA	206243.3	5.0000	CLO4-89-ISTD

*** End of Report ***



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Unmodified

Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI03.D

Sample Name: CLO4@ 1.0ug/L

Injection Date: 9/20/2019 09:24:05

Seq Line: 3

Sample Name: CLO4@ 1.0ug/L

Location: Vial 73

Acq Operator: TNB

Inj. No.: 1

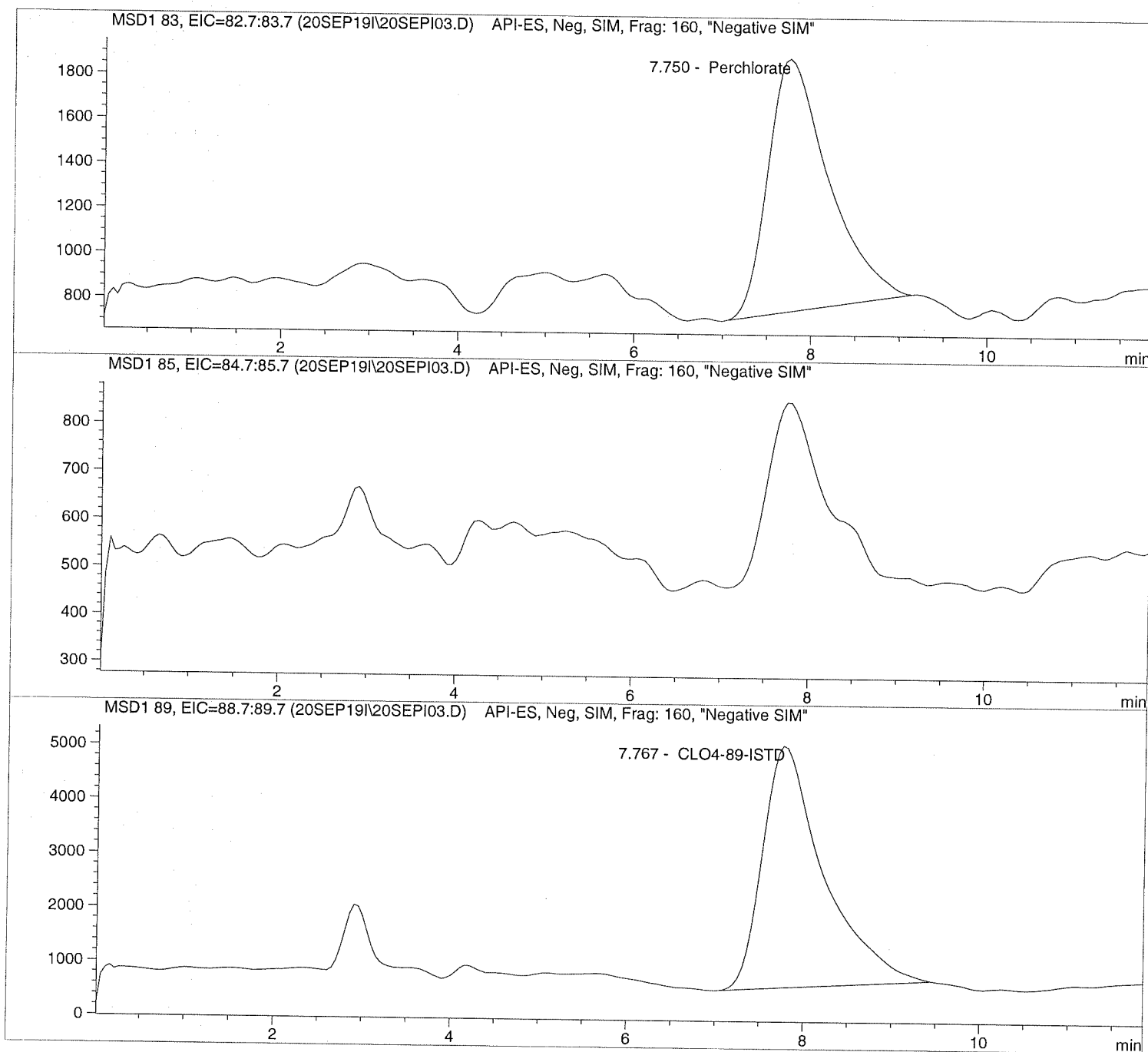
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M

Last Changed: 9/23/2019 12:27:11

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI03.D Sample Name: CLO4@ 1.0ug/L

=====
Injection Date: 9/20/2019 09:24:05 Seq Line: 3
Sample Name: CLO4@ 1.0ug/L Location: Vial 73
Acq Operator: TNB Inj. No.: 1
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:27:11

Perchlorate analysis

=====
Sample Information
=====

Sorted By: Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 1.000

=====
LCMS Results
=====

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.750	PBA	53921.8	0.8760	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.767	PBA	214568.1	5.0000	CLO4-89-ISTD

=====
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\23DEC19D\23DECD21.D

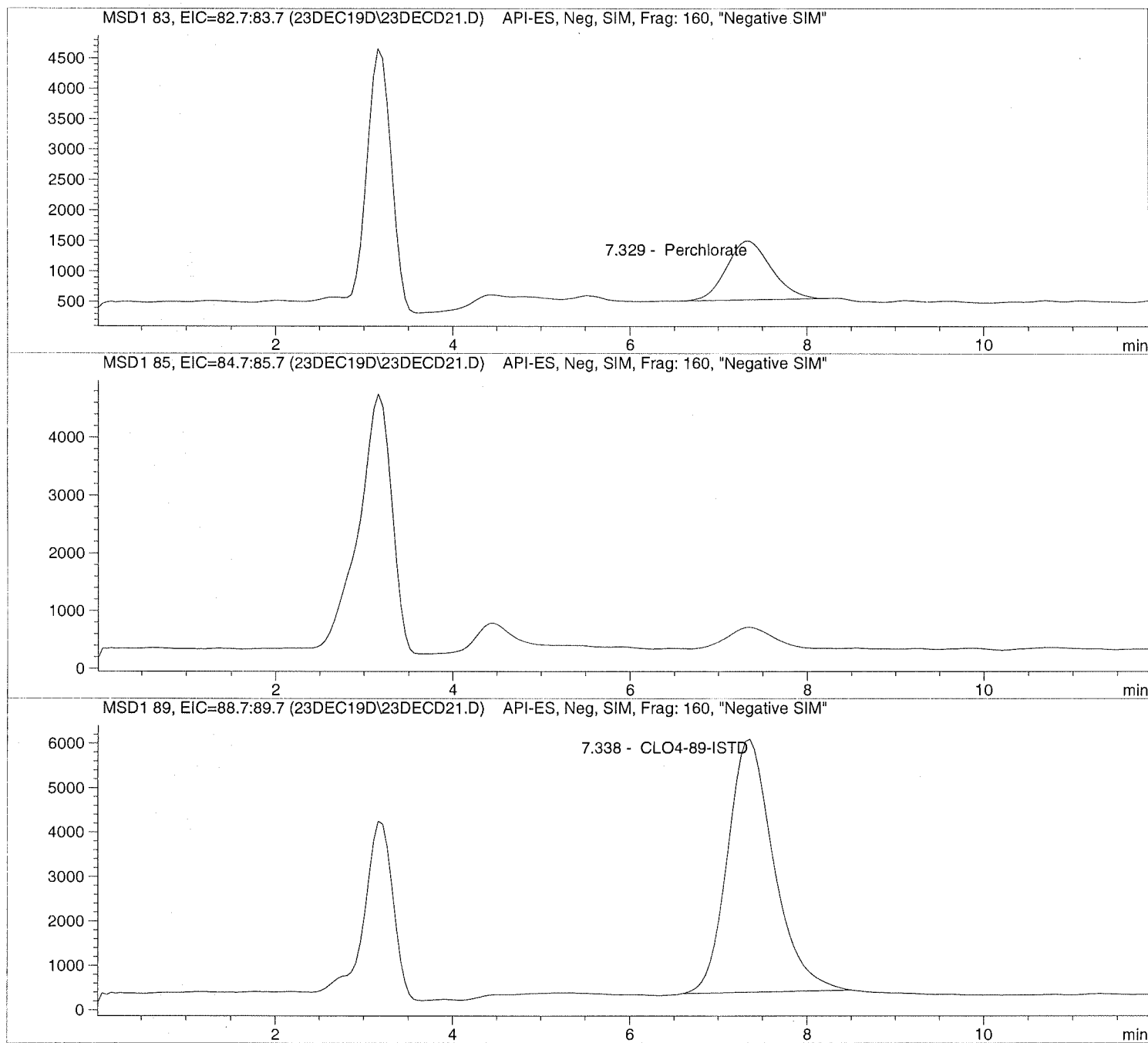
Sample Name: 1935347006

=====
Injection Date: 12/23/2019 12:49:23
Sample Name: 1935347006
Acq Operator: TNB

Seq Line: 21
Location: Vial 90
Inj. No.: 1
Inj. Vol.: 35 μ l

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23DEC19D\23DECD21.D Sample Name: 1935347006

```

=====
Injection Date: 12/23/2019 12:49:23      Seq Line:          21
Sample Name:    1935347006                Location:          Vial 90
Acq Operator:   TNB                       Inj. No.:         1
                                           Inj. Vol.:       35 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  0.000
=====

```

```

=====
                          LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.329	PBA	33750.8	0.5414	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.338	BBA	206441.3	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\23DEC19D\23DECD23.D

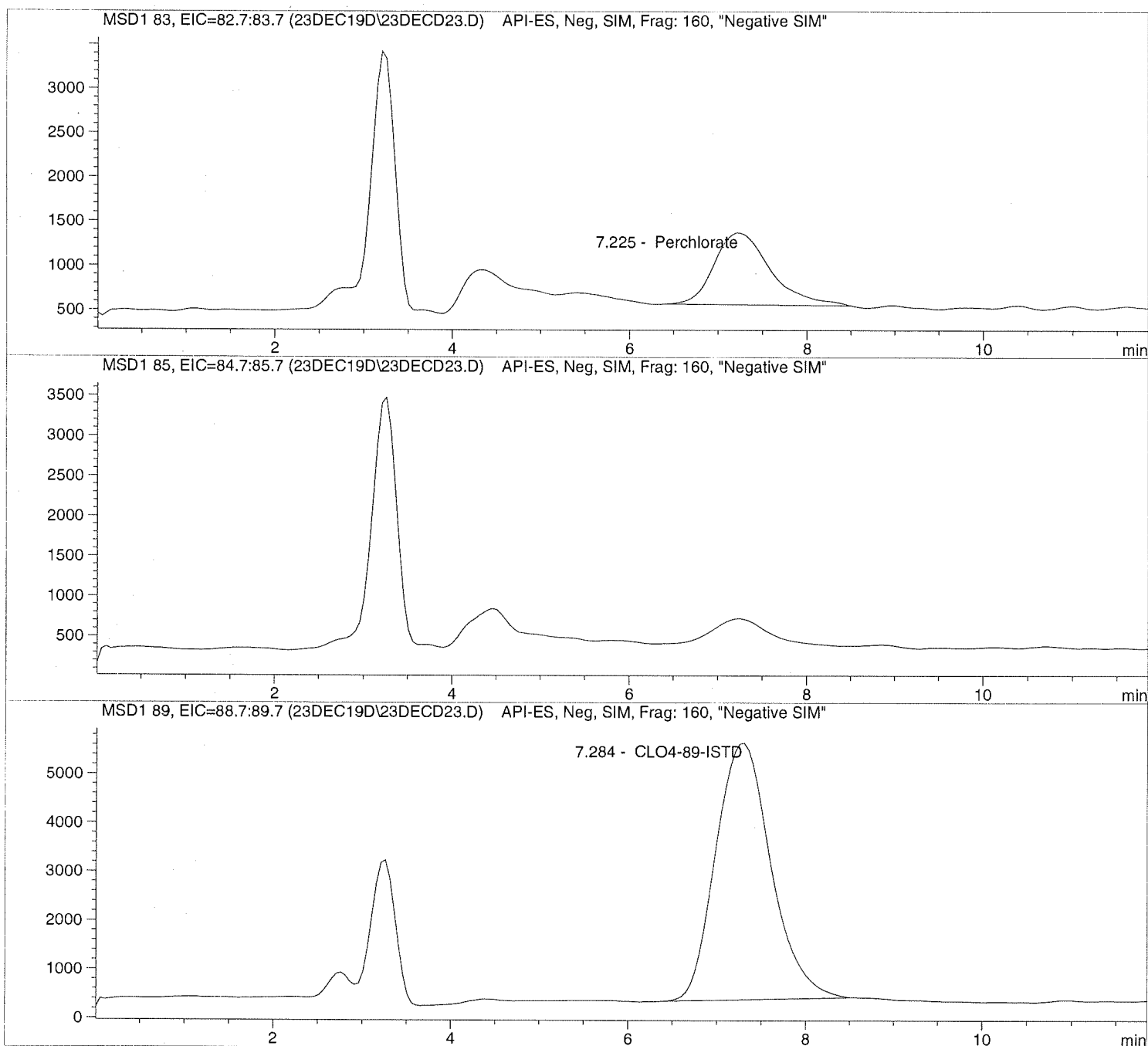
Sample Name: 1935366001

=====
Injection Date: 12/23/2019 13:17:14
Sample Name: 1935366001
Acq Operator: TNB

Seq Line: 23
Location: Vial 92
Inj. No.: 1
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23DEC19D\23DECD23.D Sample Name: 1935366001

```

=====
Injection Date: 12/23/2019 13:17:14      Seq Line: 23
Sample Name: 1935366001                  Location: Vial 92
Acq Operator: TNB                        Inj. No.: 1
                                           Inj. Vol.: 35 µl
=====

```

```

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45
=====

```

Perchlorate analysis

Sample Information

```

=====
Sorted By: Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 0.000
=====

```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.225	PBA	35581.3	0.5167	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.284	PBA	226617.1	5.0000	CLO4-89-ISTD

*** End of Report ***



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December 31, 2019

Marcia Olive
Bhate Environmental Associates, Inc.
445 Union Blvd Ste 129
Lakewood, CO 80228

Work Order: **HS19120843**

Laboratory Results for: **LHAAP/Site 18/24**

Dear Marcia,

ALS Environmental received 7 sample(s) on Dec 14, 2019 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,

A handwritten signature in black ink, appearing to read "Raj. P. Modashia", enclosed in a circular scribble.

Generated By: DAYNA.FISHER

RJ Modashia
Project Manager

ALS Houston, US

Date: 31-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP/Site 18/24
Work Order: HS19120843

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19120843-01	18CpTMW16_121319	Groundwater		13-Dec-2019 07:55	14-Dec-2019 09:30	<input type="checkbox"/>
HS19120843-02	AWD3_121319	Groundwater		13-Dec-2019 08:50	14-Dec-2019 09:30	<input type="checkbox"/>
HS19120843-03	AWD3_121319_a	Groundwater		13-Dec-2019 08:50	14-Dec-2019 09:30	<input type="checkbox"/>
HS19120843-04	MW5_121319	Groundwater		13-Dec-2019 09:40	14-Dec-2019 09:30	<input type="checkbox"/>
HS19120843-05	18CpTMW08DW_121319	Groundwater		13-Dec-2019 10:25	14-Dec-2019 09:30	<input type="checkbox"/>
HS19120843-06	18CpTMW08SW_121319	Groundwater		13-Dec-2019 11:10	14-Dec-2019 09:30	<input type="checkbox"/>
HS19120843-07	Trip Blank	Water		13-Dec-2019 00:00	14-Dec-2019 09:30	<input type="checkbox"/>

ALS Houston, US

Date: 31-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP/Site 18/24
Work Order: HS19120843

CASE NARRATIVE

Work Order Comments

- The analysis for Perchlorate was subcontracted to ALS Environmental in Salt Lake City, Utah. Final report attached.
-

GCMS Semivolatiles by Method SW8270SIM**Batch ID: 148814**

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

GCMS Volatiles by Method SW8260**Batch ID: R352800****Sample ID: CCV**

- Carbon Disulfide and 1,2,3-Trichlorobenzene exceeded %D limits for CCV. Sample are ND for these compounds.

Sample ID: VLCSW-191218

- 1,2,3-Trichlorobenzene is also high for LCS.

Sample ID: MW5_121319 (HS19120843-04MS)

- MS and/or MSD recovered outside control limits
-

Metals by Method SW6020**Batch ID: 149105****Sample ID: HS19120702-03MS**

- MS/MSD and DUPs are for an unrelated sample
-

Metals by Method SW7470**Batch ID: 149099**

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

ALS Houston, US

Date: 31-Dec-19

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP/Site 18/24
 Sample ID: 18CpTMW16_121319
 Collection Date: 13-Dec-2019 07:55

ANALYTICAL REPORT

WorkOrder:HS19120843
 Lab ID:HS19120843-01
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
SEMIVOLATILES SIM	Method:SW8270SIM					Prep:SW3510 / 17-Dec-2019		Analyst: LG
1,4-Dioxane	0.18		0.010	0.010	0.010	ug/L	1	20-Dec-2019 15:15
<i>Surr: 2-Fluorobiphenyl</i>	101			0	40-140	%REC	1	20-Dec-2019 15:15
<i>Surr: 4-Terphenyl-d14</i>	112			0	40-140	%REC	1	20-Dec-2019 15:15
<i>Surr: Nitrobenzene-d5</i>	90.0			0	40-140	%REC	1	20-Dec-2019 15:15
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)	Method:NA							Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	23-Dec-2019 17:05

ALS Houston, US

Date: 31-Dec-19

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP/Site 18/24
 Sample ID: AWD3_121319
 Collection Date: 13-Dec-2019 08:50

ANALYTICAL REPORT
 WorkOrder:HS19120843
 Lab ID:HS19120843-02
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED	
VOLATILES ORGANICS BY METHOD 8260C		Method:SW8260							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 14:12	
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	18-Dec-2019 14:12	
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	18-Dec-2019 14:12	
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 14:12	
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	18-Dec-2019 14:12	
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	18-Dec-2019 14:12	
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 14:12	
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	18-Dec-2019 14:12	
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	18-Dec-2019 14:12	
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	18-Dec-2019 14:12	
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 14:12	
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	18-Dec-2019 14:12	
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	18-Dec-2019 14:12	
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	18-Dec-2019 14:12	
1,2-Dichloroethane	1.5		0.20	0.50	1.0	UG/L	1	18-Dec-2019 14:12	
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	18-Dec-2019 14:12	
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 14:12	
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	18-Dec-2019 14:12	
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 14:12	
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	18-Dec-2019 14:12	
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	18-Dec-2019 14:12	
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	18-Dec-2019 14:12	
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 14:12	
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	18-Dec-2019 14:12	
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	18-Dec-2019 14:12	
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 14:12	
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	18-Dec-2019 14:12	
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	18-Dec-2019 14:12	
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	18-Dec-2019 14:12	
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	18-Dec-2019 14:12	
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	18-Dec-2019 14:12	
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	18-Dec-2019 14:12	
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	18-Dec-2019 14:12	
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	18-Dec-2019 14:12	
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	18-Dec-2019 14:12	
Carbon tetrachloride	8.4		0.50	0.50	1.0	UG/L	1	18-Dec-2019 14:12	
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 14:12	
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 14:12	
Chloroform	0.97	J	0.20	0.50	1.0	UG/L	1	18-Dec-2019 14:12	

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

ALS Houston, US

Date: 31-Dec-19

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP/Site 18/24
 Sample ID: AWD3_121319
 Collection Date: 13-Dec-2019 08:50

ANALYTICAL REPORT

WorkOrder:HS19120843
 Lab ID:HS19120843-02
 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	18-Dec-2019 14:12	
cis-1,2-Dichloroethene	6.8		0.20	0.50	1.0	UG/L	1	18-Dec-2019 14:12	
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	18-Dec-2019 14:12	
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 14:12	
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	18-Dec-2019 14:12	
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 14:12	
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 14:12	
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	UG/L	1	18-Dec-2019 14:12	
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 14:12	
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	18-Dec-2019 14:12	
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	18-Dec-2019 14:12	
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	18-Dec-2019 14:12	
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 14:12	
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 14:12	
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 14:12	
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 14:12	
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 14:12	
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 14:12	
Tetrachloroethene	1.1		0.30	0.50	1.0	UG/L	1	18-Dec-2019 14:12	
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	18-Dec-2019 14:12	
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	18-Dec-2019 14:12	
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	18-Dec-2019 14:12	
Trichloroethene	230		1.0	2.5	5.0	UG/L	5	18-Dec-2019 15:48	
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 14:12	
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	18-Dec-2019 14:12	
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>91.5</i>			0	<i>81-118</i>	%REC	1	18-Dec-2019 14:12	
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>92.1</i>			0	<i>81-118</i>	%REC	5	18-Dec-2019 15:48	
<i>Surr: 4-Bromofluorobenzene</i>	<i>101</i>			0	<i>85-114</i>	%REC	5	18-Dec-2019 15:48	
<i>Surr: 4-Bromofluorobenzene</i>	<i>99.4</i>			0	<i>85-114</i>	%REC	1	18-Dec-2019 14:12	
<i>Surr: Dibromofluoromethane</i>	<i>92.6</i>			0	<i>80-119</i>	%REC	1	18-Dec-2019 14:12	
<i>Surr: Dibromofluoromethane</i>	<i>92.9</i>			0	<i>80-119</i>	%REC	5	18-Dec-2019 15:48	
<i>Surr: Toluene-d8</i>	<i>101</i>			0	<i>89-112</i>	%REC	1	18-Dec-2019 14:12	
<i>Surr: Toluene-d8</i>	<i>102</i>			0	<i>89-112</i>	%REC	5	18-Dec-2019 15:48	

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

ALS Houston, US

Date: 31-Dec-19

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP/Site 18/24
 Sample ID: AWD3_121319
 Collection Date: 13-Dec-2019 08:50

ANALYTICAL REPORT
 WorkOrder:HS19120843
 Lab ID:HS19120843-02
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A		Method:SW6020				Prep:SW3010A / 24-Dec-2019		Analyst: JHD
Aluminum	0.164		0.00180	0.00500	0.0100	mg/L	1	27-Dec-2019 14:54
Antimony	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	27-Dec-2019 14:54
Arsenic	0.000581	J	0.000400	0.000500	0.00500	mg/L	1	27-Dec-2019 14:54
Barium	0.0350		0.00190	0.00250	0.00500	mg/L	1	27-Dec-2019 14:54
Beryllium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	27-Dec-2019 14:54
Cadmium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	27-Dec-2019 14:54
Calcium	0.856		0.0340	0.0500	0.500	mg/L	1	27-Dec-2019 14:54
Chromium	0.696		0.000400	0.000500	0.00500	mg/L	1	27-Dec-2019 14:54
Cobalt	0.00622		0.000100	0.000500	0.00500	mg/L	1	27-Dec-2019 14:54
Copper	0.00578		0.00100	0.00250	0.00500	mg/L	1	27-Dec-2019 14:54
Iron	2.32		0.0120	0.0500	0.200	mg/L	1	27-Dec-2019 14:54
Lead	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	27-Dec-2019 14:54
Magnesium	0.572		0.0100	0.0500	0.200	mg/L	1	27-Dec-2019 14:54
Manganese	0.0510		0.000700	0.00250	0.00500	mg/L	1	27-Dec-2019 14:54
Nickel	0.341		0.000600	0.00100	0.00500	mg/L	1	27-Dec-2019 14:54
Potassium	0.639		0.0180	0.0500	0.200	mg/L	1	27-Dec-2019 14:54
Selenium	0.00549		0.00110	0.00250	0.00500	mg/L	1	27-Dec-2019 14:54
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	27-Dec-2019 14:54
Sodium	32.1		0.0140	0.0500	0.200	mg/L	1	27-Dec-2019 14:54
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	27-Dec-2019 14:54
Vanadium	0.00278	J	0.000600	0.00100	0.00500	mg/L	1	27-Dec-2019 14:54
Zinc	0.00274	J	0.00200	0.00250	0.00500	mg/L	1	27-Dec-2019 14:54
MERCURY BY SW7470A		Method:SW7470				Prep:SW7470 / 24-Dec-2019		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	24-Dec-2019 17:32
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		Method:NA						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	23-Dec-2019 17:05

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

ALS Houston, US

Date: 31-Dec-19

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP/Site 18/24
 Sample ID: AWD3_121319_a
 Collection Date: 13-Dec-2019 08:50

ANALYTICAL REPORT
 WorkOrder:HS19120843
 Lab ID:HS19120843-03
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED	
VOLATILES ORGANICS BY METHOD 8260C		Method:SW8260							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 14:36	
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	18-Dec-2019 14:36	
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	18-Dec-2019 14:36	
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 14:36	
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	18-Dec-2019 14:36	
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	18-Dec-2019 14:36	
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 14:36	
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	18-Dec-2019 14:36	
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	18-Dec-2019 14:36	
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	18-Dec-2019 14:36	
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 14:36	
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	18-Dec-2019 14:36	
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	18-Dec-2019 14:36	
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	18-Dec-2019 14:36	
1,2-Dichloroethane	1.5		0.20	0.50	1.0	UG/L	1	18-Dec-2019 14:36	
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	18-Dec-2019 14:36	
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 14:36	
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	18-Dec-2019 14:36	
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 14:36	
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	18-Dec-2019 14:36	
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	18-Dec-2019 14:36	
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	18-Dec-2019 14:36	
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 14:36	
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	18-Dec-2019 14:36	
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	18-Dec-2019 14:36	
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 14:36	
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	18-Dec-2019 14:36	
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	18-Dec-2019 14:36	
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	18-Dec-2019 14:36	
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	18-Dec-2019 14:36	
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	18-Dec-2019 14:36	
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	18-Dec-2019 14:36	
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	18-Dec-2019 14:36	
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	18-Dec-2019 14:36	
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	18-Dec-2019 14:36	
Carbon tetrachloride	8.5		0.50	0.50	1.0	UG/L	1	18-Dec-2019 14:36	
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 14:36	
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 14:36	
Chloroform	0.99	J	0.20	0.50	1.0	UG/L	1	18-Dec-2019 14:36	

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

ALS Houston, US

Date: 31-Dec-19

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP/Site 18/24
 Sample ID: AWD3_121319_a
 Collection Date: 13-Dec-2019 08:50

ANALYTICAL REPORT
 WorkOrder:HS19120843
 Lab ID:HS19120843-03
 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	18-Dec-2019 14:36	
cis-1,2-Dichloroethene	6.9		0.20	0.50	1.0	UG/L	1	18-Dec-2019 14:36	
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	18-Dec-2019 14:36	
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 14:36	
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	18-Dec-2019 14:36	
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 14:36	
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 14:36	
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	UG/L	1	18-Dec-2019 14:36	
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 14:36	
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	18-Dec-2019 14:36	
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	18-Dec-2019 14:36	
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	18-Dec-2019 14:36	
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 14:36	
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 14:36	
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 14:36	
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 14:36	
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 14:36	
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 14:36	
Tetrachloroethene	1.0		0.30	0.50	1.0	UG/L	1	18-Dec-2019 14:36	
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	18-Dec-2019 14:36	
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	18-Dec-2019 14:36	
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	18-Dec-2019 14:36	
Trichloroethene	220		1.0	2.5	5.0	UG/L	5	18-Dec-2019 16:12	
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 14:36	
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	18-Dec-2019 14:36	
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>91.4</i>			0	<i>81-118</i>	%REC	5	18-Dec-2019 16:12	
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>91.3</i>			0	<i>81-118</i>	%REC	1	18-Dec-2019 14:36	
<i>Surr: 4-Bromofluorobenzene</i>	<i>100</i>			0	<i>85-114</i>	%REC	1	18-Dec-2019 14:36	
<i>Surr: 4-Bromofluorobenzene</i>	<i>99.5</i>			0	<i>85-114</i>	%REC	5	18-Dec-2019 16:12	
<i>Surr: Dibromofluoromethane</i>	<i>92.8</i>			0	<i>80-119</i>	%REC	1	18-Dec-2019 14:36	
<i>Surr: Dibromofluoromethane</i>	<i>92.1</i>			0	<i>80-119</i>	%REC	5	18-Dec-2019 16:12	
<i>Surr: Toluene-d8</i>	<i>99.8</i>			0	<i>89-112</i>	%REC	1	18-Dec-2019 14:36	
<i>Surr: Toluene-d8</i>	<i>103</i>			0	<i>89-112</i>	%REC	5	18-Dec-2019 16:12	

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

ALS Houston, US

Date: 31-Dec-19

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP/Site 18/24
 Sample ID: AWD3_121319_a
 Collection Date: 13-Dec-2019 08:50

ANALYTICAL REPORT
 WorkOrder:HS19120843
 Lab ID:HS19120843-03
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A			Method:SW6020			Prep:SW3010A / 24-Dec-2019		Analyst: JHD
Aluminum	0.105		0.00180	0.00500	0.0100	mg/L	1	27-Dec-2019 14:56
Antimony	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	27-Dec-2019 14:56
Arsenic	0.000503	J	0.000400	0.000500	0.00500	mg/L	1	27-Dec-2019 14:56
Barium	0.0351		0.00190	0.00250	0.00500	mg/L	1	27-Dec-2019 14:56
Beryllium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	27-Dec-2019 14:56
Cadmium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	27-Dec-2019 14:56
Calcium	0.855		0.0340	0.0500	0.500	mg/L	1	27-Dec-2019 14:56
Chromium	0.638		0.000400	0.000500	0.00500	mg/L	1	27-Dec-2019 14:56
Cobalt	0.00617		0.000100	0.000500	0.00500	mg/L	1	27-Dec-2019 14:56
Copper	0.00553		0.00100	0.00250	0.00500	mg/L	1	27-Dec-2019 14:56
Iron	2.16		0.0120	0.0500	0.200	mg/L	1	27-Dec-2019 14:56
Lead	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	27-Dec-2019 14:56
Magnesium	0.554		0.0100	0.0500	0.200	mg/L	1	27-Dec-2019 14:56
Manganese	0.0497		0.000700	0.00250	0.00500	mg/L	1	27-Dec-2019 14:56
Nickel	0.340		0.000600	0.00100	0.00500	mg/L	1	27-Dec-2019 14:56
Potassium	0.624		0.0180	0.0500	0.200	mg/L	1	27-Dec-2019 14:56
Selenium	0.00484	J	0.00110	0.00250	0.00500	mg/L	1	27-Dec-2019 14:56
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	27-Dec-2019 14:56
Sodium	31.3		0.0140	0.0500	0.200	mg/L	1	27-Dec-2019 14:56
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	27-Dec-2019 14:56
Vanadium	0.00272	J	0.000600	0.00100	0.00500	mg/L	1	27-Dec-2019 14:56
Zinc	0.00330	J	0.00200	0.00250	0.00500	mg/L	1	27-Dec-2019 14:56
MERCURY BY SW7470A			Method:SW7470			Prep:SW7470 / 24-Dec-2019		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	24-Dec-2019 17:34
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)			Method:NA			Analyst: SUB		
Subcontract Analysis	See Attached		0	0		NA	1	23-Dec-2019 17:05

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

ALS Houston, US

Date: 31-Dec-19

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP/Site 18/24
 Sample ID: MW5_121319
 Collection Date: 13-Dec-2019 09:40

ANALYTICAL REPORT
 WorkOrder:HS19120843
 Lab ID:HS19120843-04
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED	
VOLATILES ORGANICS BY METHOD 8260C		Method:SW8260							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 13:24	
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	18-Dec-2019 13:24	
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	18-Dec-2019 13:24	
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 13:24	
1,1-Dichloroethane	3.0		0.20	0.50	1.0	UG/L	1	18-Dec-2019 13:24	
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	18-Dec-2019 13:24	
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 13:24	
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	18-Dec-2019 13:24	
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	18-Dec-2019 13:24	
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	18-Dec-2019 13:24	
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 13:24	
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	18-Dec-2019 13:24	
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	18-Dec-2019 13:24	
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	18-Dec-2019 13:24	
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	18-Dec-2019 13:24	
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	18-Dec-2019 13:24	
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 13:24	
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	18-Dec-2019 13:24	
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 13:24	
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	18-Dec-2019 13:24	
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	18-Dec-2019 13:24	
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	18-Dec-2019 13:24	
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 13:24	
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	18-Dec-2019 13:24	
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	18-Dec-2019 13:24	
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 13:24	
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	18-Dec-2019 13:24	
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	18-Dec-2019 13:24	
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	18-Dec-2019 13:24	
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	18-Dec-2019 13:24	
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	18-Dec-2019 13:24	
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	18-Dec-2019 13:24	
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	18-Dec-2019 13:24	
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	18-Dec-2019 13:24	
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	18-Dec-2019 13:24	
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	18-Dec-2019 13:24	
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 13:24	
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 13:24	
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	18-Dec-2019 13:24	

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

ALS Houston, US

Date: 31-Dec-19

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP/Site 18/24
 Sample ID: MW5_121319
 Collection Date: 13-Dec-2019 09:40

ANALYTICAL REPORT
 WorkOrder:HS19120843
 Lab ID:HS19120843-04
 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	18-Dec-2019 13:24	
cis-1,2-Dichloroethene	10		0.20	0.50	1.0	UG/L	1	18-Dec-2019 13:24	
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	18-Dec-2019 13:24	
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 13:24	
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	18-Dec-2019 13:24	
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 13:24	
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 13:24	
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	UG/L	1	18-Dec-2019 13:24	
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 13:24	
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	18-Dec-2019 13:24	
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	18-Dec-2019 13:24	
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	18-Dec-2019 13:24	
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 13:24	
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 13:24	
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 13:24	
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 13:24	
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 13:24	
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 13:24	
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 13:24	
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	18-Dec-2019 13:24	
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	18-Dec-2019 13:24	
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	18-Dec-2019 13:24	
Trichloroethene	40		0.20	0.50	1.0	UG/L	1	18-Dec-2019 13:24	
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 13:24	
Vinyl chloride	3.0		0.20	0.50	1.0	UG/L	1	18-Dec-2019 13:24	
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>90.7</i>			0	<i>81-118</i>	%REC	1	18-Dec-2019 13:24	
<i>Surr: 4-Bromofluorobenzene</i>	<i>101</i>			0	<i>85-114</i>	%REC	1	18-Dec-2019 13:24	
<i>Surr: Dibromofluoromethane</i>	<i>93.8</i>			0	<i>80-119</i>	%REC	1	18-Dec-2019 13:24	
<i>Surr: Toluene-d8</i>	<i>101</i>			0	<i>89-112</i>	%REC	1	18-Dec-2019 13:24	
SEMIVOLATILES SIM		Method:SW8270SIM				Prep:SW3510 / 17-Dec-2019		Analyst: LG	
1,4-Dioxane	1.6		0.040	0.040	0.040	ug/L	4	23-Dec-2019 16:03	
<i>Surr: 2-Fluorobiphenyl</i>	<i>117</i>			0	<i>40-140</i>	%REC	4	23-Dec-2019 16:03	
<i>Surr: 4-Terphenyl-d14</i>	<i>89.8</i>			0	<i>40-140</i>	%REC	4	23-Dec-2019 16:03	
<i>Surr: Nitrobenzene-d5</i>	<i>131</i>			0	<i>40-140</i>	%REC	4	23-Dec-2019 16:03	

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

ALS Houston, US

Date: 31-Dec-19

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP/Site 18/24
 Sample ID: MW5_121319
 Collection Date: 13-Dec-2019 09:40

ANALYTICAL REPORT
 WorkOrder:HS19120843
 Lab ID:HS19120843-04
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A			Method:SW6020			Prep:SW3010A / 24-Dec-2019		Analyst: JHD
Aluminum	0.00447	J	0.00180	0.00500	0.0100	mg/L	1	27-Dec-2019 14:58
Antimony	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	27-Dec-2019 14:58
Arsenic	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	27-Dec-2019 14:58
Barium	0.977		0.00190	0.00250	0.00500	mg/L	1	27-Dec-2019 14:58
Beryllium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	27-Dec-2019 14:58
Cadmium	0.000789	J	0.000200	0.000500	0.00200	mg/L	1	27-Dec-2019 14:58
Calcium	23.1		0.0340	0.0500	0.500	mg/L	1	27-Dec-2019 14:58
Chromium	0.0330		0.000400	0.000500	0.00500	mg/L	1	27-Dec-2019 14:58
Cobalt	0.00353	J	0.000100	0.000500	0.00500	mg/L	1	27-Dec-2019 14:58
Copper	0.00250	U	0.00100	0.00250	0.00500	mg/L	1	27-Dec-2019 14:58
Iron	0.127	J	0.0120	0.0500	0.200	mg/L	1	27-Dec-2019 14:58
Lead	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	27-Dec-2019 14:58
Magnesium	24.8		0.0100	0.0500	0.200	mg/L	1	27-Dec-2019 14:58
Manganese	0.0984		0.000700	0.00250	0.00500	mg/L	1	27-Dec-2019 14:58
Nickel	0.0630		0.000600	0.00100	0.00500	mg/L	1	27-Dec-2019 14:58
Potassium	2.30		0.0180	0.0500	0.200	mg/L	1	27-Dec-2019 14:58
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	27-Dec-2019 14:58
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	27-Dec-2019 14:58
Sodium	129		0.0140	0.0500	0.200	mg/L	1	27-Dec-2019 14:58
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	27-Dec-2019 14:58
Vanadium	0.00147	J	0.000600	0.00100	0.00500	mg/L	1	27-Dec-2019 14:58
Zinc	0.0222		0.00200	0.00250	0.00500	mg/L	1	27-Dec-2019 14:58
MERCURY BY SW7470A			Method:SW7470			Prep:SW7470 / 24-Dec-2019		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	24-Dec-2019 17:36
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)			Method:NA			Analyst: SUB		
Subcontract Analysis	See Attached		0	0		NA	1	23-Dec-2019 17:05

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

ALS Houston, US

Date: 31-Dec-19

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP/Site 18/24
 Sample ID: 18CpTMW08DW_121319
 Collection Date: 13-Dec-2019 10:25

ANALYTICAL REPORT

WorkOrder:HS19120843
 Lab ID:HS19120843-05
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
SEMIVOLATILES SIM	Method:SW8270SIM					Prep:SW3510 / 17-Dec-2019		Analyst: LG
1,4-Dioxane	0.31		0.010	0.010	0.010	ug/L	1	20-Dec-2019 15:53
<i>Surr: 2-Fluorobiphenyl</i>	112			0	40-140	%REC	1	20-Dec-2019 15:53
<i>Surr: 4-Terphenyl-d14</i>	76.3			0	40-140	%REC	1	20-Dec-2019 15:53
<i>Surr: Nitrobenzene-d5</i>	130			0	40-140	%REC	1	20-Dec-2019 15:53
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)	Method:NA							Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	23-Dec-2019 17:05

ALS Houston, US

Date: 31-Dec-19

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP/Site 18/24
 Sample ID: 18CpTMW08SW_121319
 Collection Date: 13-Dec-2019 11:10

ANALYTICAL REPORT
 WorkOrder:HS19120843
 Lab ID:HS19120843-06
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD		Method:SW8260						
8260C								Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 13:48
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	18-Dec-2019 13:48
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	18-Dec-2019 13:48
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 13:48
1,1-Dichloroethane	3.7		0.20	0.50	1.0	UG/L	1	18-Dec-2019 13:48
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	18-Dec-2019 13:48
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 13:48
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	18-Dec-2019 13:48
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	18-Dec-2019 13:48
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	18-Dec-2019 13:48
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 13:48
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	18-Dec-2019 13:48
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	18-Dec-2019 13:48
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	18-Dec-2019 13:48
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	18-Dec-2019 13:48
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	18-Dec-2019 13:48
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 13:48
1,3-Dichlorobenzene	0.59	J	0.40	0.50	1.0	UG/L	1	18-Dec-2019 13:48
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 13:48
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	18-Dec-2019 13:48
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	18-Dec-2019 13:48
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	18-Dec-2019 13:48
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 13:48
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	18-Dec-2019 13:48
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	18-Dec-2019 13:48
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 13:48
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	18-Dec-2019 13:48
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	18-Dec-2019 13:48
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	18-Dec-2019 13:48
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	18-Dec-2019 13:48
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	18-Dec-2019 13:48
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	18-Dec-2019 13:48
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	18-Dec-2019 13:48
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	18-Dec-2019 13:48
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	18-Dec-2019 13:48
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	18-Dec-2019 13:48
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 13:48
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 13:48
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	18-Dec-2019 13:48

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

ALS Houston, US

Date: 31-Dec-19

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP/Site 18/24
 Sample ID: 18CpTMW08SW_121319
 Collection Date: 13-Dec-2019 11:10

ANALYTICAL REPORT
 WorkOrder:HS19120843
 Lab ID:HS19120843-06
 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	18-Dec-2019 13:48	
cis-1,2-Dichloroethene	11		0.20	0.50	1.0	UG/L	1	18-Dec-2019 13:48	
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	18-Dec-2019 13:48	
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 13:48	
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	18-Dec-2019 13:48	
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 13:48	
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 13:48	
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	UG/L	1	18-Dec-2019 13:48	
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 13:48	
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	18-Dec-2019 13:48	
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	18-Dec-2019 13:48	
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	18-Dec-2019 13:48	
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 13:48	
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 13:48	
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 13:48	
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 13:48	
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 13:48	
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 13:48	
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 13:48	
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	18-Dec-2019 13:48	
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	18-Dec-2019 13:48	
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	18-Dec-2019 13:48	
Trichloroethene	42		0.20	0.50	1.0	UG/L	1	18-Dec-2019 13:48	
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 13:48	
Vinyl chloride	2.7		0.20	0.50	1.0	UG/L	1	18-Dec-2019 13:48	
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>91.3</i>			0	<i>81-118</i>	%REC	<i>1</i>	<i>18-Dec-2019 13:48</i>	
<i>Surr: 4-Bromofluorobenzene</i>	<i>99.3</i>			0	<i>85-114</i>	%REC	<i>1</i>	<i>18-Dec-2019 13:48</i>	
<i>Surr: Dibromofluoromethane</i>	<i>93.6</i>			0	<i>80-119</i>	%REC	<i>1</i>	<i>18-Dec-2019 13:48</i>	
<i>Surr: Toluene-d8</i>	<i>101</i>			0	<i>89-112</i>	%REC	<i>1</i>	<i>18-Dec-2019 13:48</i>	
SEMIVOLATILES SIM		Method:SW8270SIM						Prep:SW3510 / 17-Dec-2019 Analyst: LG	
1,4-Dioxane	3.0		0.10	0.10	0.10	ug/L	10	23-Dec-2019 16:22	
<i>Surr: 2-Fluorobiphenyl</i>	<i>112</i>			0	<i>40-140</i>	%REC	<i>10</i>	<i>23-Dec-2019 16:22</i>	
<i>Surr: 4-Terphenyl-d14</i>	<i>126</i>			0	<i>40-140</i>	%REC	<i>10</i>	<i>23-Dec-2019 16:22</i>	
<i>Surr: Nitrobenzene-d5</i>	<i>125</i>			0	<i>40-140</i>	%REC	<i>10</i>	<i>23-Dec-2019 16:22</i>	
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		Method:NA						Analyst: SUB	
Subcontract Analysis	See Attached		0	0		NA	1	23-Dec-2019 17:05	

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

ALS Houston, US

Date: 31-Dec-19

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP/Site 18/24
 Sample ID: Trip Blank
 Collection Date: 13-Dec-2019 00:00

ANALYTICAL REPORT
 WorkOrder:HS19120843
 Lab ID:HS19120843-07
 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED	
VOLATILES ORGANICS BY METHOD 8260C		Method:SW8260							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 12:11	
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	18-Dec-2019 12:11	
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	18-Dec-2019 12:11	
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 12:11	
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	18-Dec-2019 12:11	
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	18-Dec-2019 12:11	
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 12:11	
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	18-Dec-2019 12:11	
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	18-Dec-2019 12:11	
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	18-Dec-2019 12:11	
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 12:11	
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	18-Dec-2019 12:11	
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	18-Dec-2019 12:11	
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	18-Dec-2019 12:11	
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	18-Dec-2019 12:11	
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	18-Dec-2019 12:11	
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 12:11	
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	18-Dec-2019 12:11	
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 12:11	
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	18-Dec-2019 12:11	
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	18-Dec-2019 12:11	
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	18-Dec-2019 12:11	
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 12:11	
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	18-Dec-2019 12:11	
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	18-Dec-2019 12:11	
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 12:11	
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	18-Dec-2019 12:11	
Acetone	3.0		0.40	1.0	2.0	UG/L	1	18-Dec-2019 12:11	
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	18-Dec-2019 12:11	
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	18-Dec-2019 12:11	
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	18-Dec-2019 12:11	
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	18-Dec-2019 12:11	
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	18-Dec-2019 12:11	
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	18-Dec-2019 12:11	
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	18-Dec-2019 12:11	
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	18-Dec-2019 12:11	
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 12:11	
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 12:11	
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	18-Dec-2019 12:11	

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

ALS Houston, US

Date: 31-Dec-19

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP/Site 18/24
 Sample ID: Trip Blank
 Collection Date: 13-Dec-2019 00:00

ANALYTICAL REPORT
 WorkOrder:HS19120843
 Lab ID:HS19120843-07
 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED	
VOLATILES ORGANICS BY METHOD		Method:SW8260							Analyst: PC
8260C									
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	18-Dec-2019 12:11	
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	18-Dec-2019 12:11	
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	18-Dec-2019 12:11	
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 12:11	
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	18-Dec-2019 12:11	
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 12:11	
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 12:11	
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	UG/L	1	18-Dec-2019 12:11	
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 12:11	
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	18-Dec-2019 12:11	
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	18-Dec-2019 12:11	
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	18-Dec-2019 12:11	
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 12:11	
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 12:11	
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 12:11	
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 12:11	
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 12:11	
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 12:11	
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 12:11	
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	18-Dec-2019 12:11	
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	18-Dec-2019 12:11	
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	18-Dec-2019 12:11	
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	18-Dec-2019 12:11	
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 12:11	
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	18-Dec-2019 12:11	
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>90.8</i>			0	<i>81-118</i>	<i>%REC</i>	<i>1</i>	<i>18-Dec-2019 12:11</i>	
<i>Surr: 4-Bromofluorobenzene</i>	<i>98.8</i>			0	<i>85-114</i>	<i>%REC</i>	<i>1</i>	<i>18-Dec-2019 12:11</i>	
<i>Surr: Dibromofluoromethane</i>	<i>92.7</i>			0	<i>80-119</i>	<i>%REC</i>	<i>1</i>	<i>18-Dec-2019 12:11</i>	
<i>Surr: Toluene-d8</i>	<i>102</i>			0	<i>89-112</i>	<i>%REC</i>	<i>1</i>	<i>18-Dec-2019 12:11</i>	

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

Weight / Prep Log

Client: Bhate Environmental Associates, Inc.

Project: LHAAP/Site 18/24

WorkOrder: HS19120843

Batch ID: 148814 Start Date: 17 Dec 2019 07:00 End Date: 17 Dec 2019 15:00

Method: SV AQ SEP FUN EXTRACT-LOWLEV - 3510C Prep Code: 3510_B_SIM

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19120843-01	1	1000 (mL)	1 (mL)	0.001
HS19120843-04	1	1000 (mL)	1 (mL)	0.001
HS19120843-05	1	1000 (mL)	1 (mL)	0.001
HS19120843-06	1	1000 (mL)	1 (mL)	0.001

Batch ID: 149099 Start Date: 24 Dec 2019 10:30 End Date: 24 Dec 2019 12:30

Method: MERCURY PREP BY 7470A- WATER Prep Code: HG_WPR

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19120843-02		10 (mL)	10 (mL)	1
HS19120843-03		10 (mL)	10 (mL)	1
HS19120843-04		10 (mL)	10 (mL)	1

Batch ID: 149105 Start Date: 24 Dec 2019 12:00 End Date: 24 Dec 2019 16:00

Method: WATER - SW3010A Prep Code: 3010A

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19120843-02		10 (mL)	10 (mL)	1
HS19120843-03		10 (mL)	10 (mL)	1
HS19120843-04		10 (mL)	10 (mL)	1

ALS Houston, US

Date: 31-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP/Site 18/24
WorkOrder: HS19120843

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: 148814 (1)		Test Name : SEMIVOLATILES SIM			Matrix: Groundwater	
HS19120843-01	18CpTMW16_121319	13 Dec 2019 07:55		17 Dec 2019 07:00	20 Dec 2019 15:15	1
HS19120843-04	MW5_121319	13 Dec 2019 09:40		17 Dec 2019 07:00	23 Dec 2019 16:03	4
HS19120843-05	18CpTMW08DW_121319	13 Dec 2019 10:25		17 Dec 2019 07:00	20 Dec 2019 15:53	1
HS19120843-06	18CpTMW08SW_121319	13 Dec 2019 11:10		17 Dec 2019 07:00	23 Dec 2019 16:22	10
Batch ID: 149099 (0)		Test Name : MERCURY BY SW7470A			Matrix: Groundwater	
HS19120843-02	AWD3_121319	13 Dec 2019 08:50		24 Dec 2019 10:30	24 Dec 2019 17:32	1
HS19120843-03	AWD3_121319_a	13 Dec 2019 08:50		24 Dec 2019 10:30	24 Dec 2019 17:34	1
HS19120843-04	MW5_121319	13 Dec 2019 09:40		24 Dec 2019 10:30	24 Dec 2019 17:36	1
Batch ID: 149105 (0)		Test Name : METALS BY ICPMS BY SW6020A			Matrix: Groundwater	
HS19120843-02	AWD3_121319	13 Dec 2019 08:50		24 Dec 2019 16:00	27 Dec 2019 14:54	1
HS19120843-03	AWD3_121319_a	13 Dec 2019 08:50		24 Dec 2019 16:00	27 Dec 2019 14:56	1
HS19120843-04	MW5_121319	13 Dec 2019 09:40		24 Dec 2019 16:00	27 Dec 2019 14:58	1
Batch ID: R352800 (0)		Test Name : VOLATILES ORGANICS BY METHOD 8260C			Matrix: Water	
HS19120843-07	Trip Blank	13 Dec 2019 00:00			18 Dec 2019 12:11	1
Batch ID: R352800 (0)		Test Name : VOLATILES ORGANICS BY METHOD 8260C			Matrix: Groundwater	
HS19120843-02	AWD3_121319	13 Dec 2019 08:50			18 Dec 2019 15:48	5
HS19120843-02	AWD3_121319	13 Dec 2019 08:50			18 Dec 2019 14:12	1
HS19120843-03	AWD3_121319_a	13 Dec 2019 08:50			18 Dec 2019 16:12	5
HS19120843-03	AWD3_121319_a	13 Dec 2019 08:50			18 Dec 2019 14:36	1
HS19120843-04	MW5_121319	13 Dec 2019 09:40			18 Dec 2019 13:24	1
HS19120843-06	18CpTMW08SW_121319	13 Dec 2019 11:10			18 Dec 2019 13:48	1
Batch ID: R353152 (0)		Test Name : SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)			Matrix: Groundwater	
HS19120843-01	18CpTMW16_121319	13 Dec 2019 07:55			23 Dec 2019 17:05	1
HS19120843-02	AWD3_121319	13 Dec 2019 08:50			23 Dec 2019 17:05	1
HS19120843-03	AWD3_121319_a	13 Dec 2019 08:50			23 Dec 2019 17:05	1
HS19120843-04	MW5_121319	13 Dec 2019 09:40			23 Dec 2019 17:05	1
HS19120843-05	18CpTMW08DW_121319	13 Dec 2019 10:25			23 Dec 2019 17:05	1
HS19120843-06	18CpTMW08SW_121319	13 Dec 2019 11:10			23 Dec 2019 17:05	1

ALS Houston, US

Date: 31-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP/Site 18/24
WorkOrder: HS19120843

QC BATCH REPORT

Batch ID: 149099 (0)		Instrument: HG03		Method: MERCURY BY SW7470A						
MBLK	Sample ID: MBLK-149099	Units: mg/L		Analysis Date: 24-Dec-2019 17:00						
Client ID:	Run ID: HG03_353245	SeqNo: 5408656		PrepDate: 24-Dec-2019		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual	
Mercury	0.000100	0.000200							U	
LCS	Sample ID: LCS-149099	Units: mg/L		Analysis Date: 24-Dec-2019 17:02						
Client ID:	Run ID: HG03_353245	SeqNo: 5408657		PrepDate: 24-Dec-2019		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual	
Mercury	0.00500	0.000200	0.005	0	100	82 - 119				
MS	Sample ID: HS19120702-03MS	Units: mg/L		Analysis Date: 24-Dec-2019 17:05						
Client ID:	Run ID: HG03_353245	SeqNo: 5408659		PrepDate: 24-Dec-2019		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual	
Mercury	0.00495	0.000200	0.005	-0.000005000	99.1	82 - 119				
MSD	Sample ID: HS19120702-03MSD	Units: mg/L		Analysis Date: 24-Dec-2019 17:07						
Client ID:	Run ID: HG03_353245	SeqNo: 5408660		PrepDate: 24-Dec-2019		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual	
Mercury	0.00505	0.000200	0.005	-0.000005000	101	82 - 119	0.004950	2	20	
The following samples were analyzed in this batch:										
HS19120843-02 HS19120843-03 HS19120843-04										

ALS Houston, US

Date: 31-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP/Site 18/24
WorkOrder: HS19120843

QC BATCH REPORT

Batch ID: 149105 (0)		Instrument: ICPMS05		Method: METALS BY ICPMS BY SW6020A						
LCS	Sample ID: LCS-149105	Units: mg/L			Analysis Date: 27-Dec-2019 14:33					
Client ID:	Run ID: ICPMS05_353383	SeqNo: 5412820	PrepDate: 24-Dec-2019	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.09227	0.0100	0.1	0	92.3	84 - 117				
Antimony	0.05171	0.00500	0.05	0	103	85 - 117				
Arsenic	0.05071	0.00500	0.05	0	101	84 - 116				
Barium	0.04742	0.00500	0.05	0	94.8	86 - 114				
Beryllium	0.04757	0.00200	0.05	0	95.1	83 - 121				
Cadmium	0.04941	0.00200	0.05	0	98.8	87 - 115				
Calcium	5.231	0.500	5	0	105	87 - 118				
Chromium	0.04905	0.00500	0.05	0	98.1	85 - 116				
Cobalt	0.04929	0.00500	0.05	0	98.6	86 - 115				
Copper	0.04986	0.00500	0.05	0	99.7	85 - 118				
Iron	5.023	0.200	5	0	100	87 - 118				
Lead	0.04781	0.00500	0.05	0	95.6	88 - 115				
Magnesium	5.31	0.200	5	0	106	83 - 118				
Manganese	0.04872	0.00500	0.05	0	97.4	87 - 115				
Nickel	0.05058	0.00500	0.05	0	101	85 - 117				
Potassium	5.146	0.200	5	0	103	87 - 115				
Selenium	0.0501	0.00500	0.05	0	100	80 - 120				
Silver	0.04799	0.00500	0.05	0	96.0	85 - 116				
Sodium	5.351	0.200	5	0	107	85 - 117				
Thallium	0.04462	0.00200	0.05	0	89.2	82 - 116				
Vanadium	0.04983	0.00500	0.05	0	99.7	86 - 115				
Zinc	0.05178	0.00500	0.05	0	104	83 - 119				

ALS Houston, US

Date: 31-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP/Site 18/24
WorkOrder: HS19120843

QC BATCH REPORT

Batch ID: 149105 (0)		Instrument: ICPMS05			Method: METALS BY ICPMS BY SW6020A					
MS	Sample ID: HS19120702-03MS	Units: mg/L			Analysis Date: 27-Dec-2019 16:20					
Client ID:	Run ID: ICPMS05_353383	SeqNo: 5412902		PrepDate: 24-Dec-2019		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.1096	0.0100	0.1	0.02447	85.2	84 - 117				
Antimony	0.05121	0.00500	0.05	0.000693	101	85 - 117				
Arsenic	0.05093	0.00500	0.05	0.0013	99.3	84 - 116				
Barium	0.9021	0.00500	0.05	1.115	-425	86 - 114				SO
Cadmium	0.04632	0.00200	0.05	0.0005	91.6	87 - 115				
Calcium	72.84	0.500	5	90.85	-360	87 - 118				SO
Chromium	0.5436	0.00500	0.05	0.6401	-193	85 - 116				SO
Cobalt	0.05631	0.00500	0.05	0.01007	92.5	86 - 115				
Copper	0.0567	0.00500	0.05	0.0109	91.6	85 - 118				
Lead	0.04614	0.00500	0.05	0	92.3	88 - 115				
Magnesium	31.35	0.200	5	33.71	-47.2	83 - 118				SO
Manganese	0.2371	0.00500	0.05	0.2568	-39.2	87 - 115				SO
Nickel	0.2751	0.00500	0.05	0.2826	-15.1	85 - 117				SO
Potassium	6.969	0.200	5	2.068	98.0	87 - 115				
Selenium	0.0481	0.00500	0.05	0	96.2	80 - 120				
Silver	0.04409	0.00500	0.05	0	88.2	85 - 116				
Sodium	353.2	0.200	5	417.6	-1290	85 - 117				SEO
Thallium	0.04258	0.00200	0.05	0	85.2	82 - 116				
Vanadium	0.05168	0.00500	0.05	0.003369	96.6	86 - 115				
Zinc	0.0596	0.00500	0.05	0.003288	113	83 - 119				

MS	Sample ID: HS19120702-03MS	Units: mg/L			Analysis Date: 27-Dec-2019 14:14					
Client ID:	Run ID: ICPMS05_353383	SeqNo: 5412813		PrepDate: 24-Dec-2019		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	0.05441	0.00200	0.05	-0.000001	109	83 - 121				
Iron	11.63	0.200	5	6.062	111	87 - 118				

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Date: 31-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP/Site 18/24
WorkOrder: HS19120843

QC BATCH REPORT

Batch ID: 149105 (0)		Instrument: ICPMS05		Method: METALS BY ICPMS BY SW6020A						
MSD	Sample ID: HS19120702-03MSD	Units: mg/L			Analysis Date: 27-Dec-2019 14:16					
Client ID:	Run ID: ICPMS05_353383	SeqNo: 5412814		PrepDate: 24-Dec-2019		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.131	0.0100	0.1	0.02447	107	84 - 117	0.1248	4.86	20	
Beryllium	0.05487	0.00200	0.05	-0.000001	110	83 - 121	0.05441	0.831	20	
Iron	11.43	0.200	5	6.062	107	87 - 118	11.63	1.74	20	
MSD	Sample ID: HS19120702-03MSD	Units: mg/L			Analysis Date: 27-Dec-2019 16:22					
Client ID:	Run ID: ICPMS05_353383	SeqNo: 5412903		PrepDate: 24-Dec-2019		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05219	0.00500	0.05	0.000693	103	85 - 117	0.05121	1.88	20	
Arsenic	0.0529	0.00500	0.05	0.0013	103	84 - 116	0.05093	3.8	20	
Barium	0.99	0.00500	0.05	1.115	-249	86 - 114	0.9021	9.3	20	SO
Cadmium	0.04901	0.00200	0.05	0.0005	97.0	87 - 115	0.04632	5.64	20	
Calcium	74.37	0.500	5	90.85	-330	87 - 118	72.84	2.07	20	SO
Chromium	0.5638	0.00500	0.05	0.6401	-153	85 - 116	0.5436	3.64	20	SO
Cobalt	0.05778	0.00500	0.05	0.01007	95.4	86 - 115	0.05631	2.58	20	
Copper	0.05693	0.00500	0.05	0.0109	92.0	85 - 118	0.0567	0.403	20	
Lead	0.04959	0.00500	0.05	0	99.2	88 - 115	0.04614	7.2	20	
Magnesium	32.11	0.200	5	33.71	-32.1	83 - 118	31.35	2.39	20	SO
Manganese	0.2455	0.00500	0.05	0.2568	-22.6	87 - 115	0.2371	3.46	20	SO
Nickel	0.2784	0.00500	0.05	0.2826	-8.52	85 - 117	0.2751	1.19	20	SO
Potassium	6.782	0.200	5	2.068	94.3	87 - 115	6.969	2.72	20	
Selenium	0.04645	0.00500	0.05	0	92.9	80 - 120	0.0481	3.5	20	
Silver	0.04697	0.00500	0.05	0	93.9	85 - 116	0.04409	6.33	20	
Sodium	355.3	0.200	5	417.6	-1250	85 - 117	353.2	0.58	20	SEO
Thallium	0.04625	0.00200	0.05	0	92.5	82 - 116	0.04258	8.27	20	
Vanadium	0.0527	0.00500	0.05	0.003369	98.7	86 - 115	0.05168	1.95	20	
Zinc	0.05108	0.00500	0.05	0.003288	95.6	83 - 119	0.0596	15.4	20	

ALS Houston, US

Date: 31-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP/Site 18/24
WorkOrder: HS19120843

QC BATCH REPORT

Batch ID: 149105 (0)		Instrument: ICPMS05		Method: METALS BY ICPMS BY SW6020A						
PDS	Sample ID: HS19120702-03PDS	Units: mg/L			Analysis Date: 27-Dec-2019 14:19					
Client ID:	Run ID: ICPMS05_353383	SeqNo: 5412815		PrepDate: 24-Dec-2019		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual	
Antimony	0.08256	0.00500	0.1	0.000693	81.9	80 - 120				
Arsenic	0.0932	0.00500	0.1	0.0013	91.9	80 - 120				
Barium	1.135	0.00500	0.1	1.115	20.3	80 - 120			SO	
Cadmium	0.08881	0.00200	0.1	0.0005	88.3	80 - 120				
Calcium	94.39	0.500	10	90.85	35.5	80 - 120			SO	
Chromium	0.6802	0.00500	0.1	0.6401	40.2	80 - 120			SO	
Cobalt	0.09637	0.00500	0.1	0.01007	86.3	80 - 120				
Copper	0.09484	0.00500	0.1	0.0109	83.9	80 - 120				
Iron	14.45	0.200	10	6.062	83.8	80 - 120				
Lead	0.08693	0.00500	0.1	0.00013	86.8	80 - 120				
Potassium	10.8	0.200	10	2.068	87.3	80 - 120				
Selenium	0.086	0.00500	0.1	0.00011	85.9	80 - 120				
Silver	0.08364	0.00500	0.1	0.000013	83.6	80 - 120				
Thallium	0.08765	0.00200	0.1	0.000014	87.6	80 - 120				
Vanadium	0.09222	0.00500	0.1	0.003369	88.8	80 - 120				
Zinc	0.09081	0.00500	0.1	0.003288	87.5	80 - 120				
PDS	Sample ID: HS19120702-03PDS	Units: mg/L			Analysis Date: 27-Dec-2019 16:29					
Client ID:	Run ID: ICPMS05_353383	SeqNo: 5412906		PrepDate: 24-Dec-2019		DF: 10				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual	
Barium	1.989	0.0500	1	0.8967	109	80 - 120				
Calcium	179.2	5.00	100	74.05	105	80 - 120				
Chromium	1.633	0.0500	1	0.52	111	80 - 120				
Sodium	495.9	2.00	100	375.2	121	80 - 120			S	

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Date: 31-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP/Site 18/24
WorkOrder: HS19120843

QC BATCH REPORT

Batch ID: 149105 (0)		Instrument: ICPMS05		Method: METALS BY ICPMS BY SW6020A						
SD	Sample ID: HS19120702-03SD	Units: mg/L		Analysis Date: 27-Dec-2019 14:12						
Client ID:	Run ID: ICPMS05_353383	SeqNo: 5412812	PrepDate: 24-Dec-2019	DF: 5						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Aluminum	0.01228	0.0500					0.02447	0	10	J
Antimony	0.00250	0.0250					0.000693	0	10	U
Arsenic	0.00250	0.0250					0.0013	0	10	U
Beryllium	0.00250	0.0100					-0.000001	0	10	U
Cadmium	0.00250	0.0100					0.0005	0	10	U
Cobalt	0.009437	0.0250					0.01007	0	10	J
Copper	0.01067	0.0250					0.0109	0	10	J
Iron	5.55	1.00					6.062	8.46	10	
Lead	0.00500	0.0250					0.00013	0	10	U
Magnesium	31.48	1.00					33.71	6.62	10	
Manganese	0.2333	0.0250					0.2568	9.15	10	
Nickel	0.2685	0.0250					0.2826	4.99	10	
Potassium	1.943	1.00					2.068	6.03	10	
Selenium	0.0125	0.0250					0.00011	0	10	U
Silver	0.00250	0.0250					0.000013	0	10	U
Sodium	396.1	1.00					417.6	5.15	10	
Thallium	0.00250	0.0100					0.000014	0	10	U
Vanadium	0.005733	0.0250					0.003369	0	10	J
Zinc	0.0125	0.0250					0.003288	0	10	U

SD	Sample ID: HS19120702-03SD	Units: mg/L		Analysis Date: 27-Dec-2019 16:26						
Client ID:	Run ID: ICPMS05_353383	SeqNo: 5412905	PrepDate: 24-Dec-2019	DF: 50						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Barium	0.9191	0.250					0.8967	2.49	10	
Calcium	72.7	25.0					74.05	1.82	10	
Chromium	0.5425	0.250					0.52	4.32	10	
Sodium	379.9	10.0					375.2	1.26	10	

The following samples were analyzed in this batch: HS19120843-02 HS19120843-03 HS19120843-04

ALS Houston, US

Date: 31-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP/Site 18/24
WorkOrder: HS19120843

QC BATCH REPORT

Batch ID: 148814 (1)		Instrument: SV-6		Method: SEMIVOLATILES SIM						
MBLK	Sample ID: MBLK-148814	Units: ug/L			Analysis Date: 20-Dec-2019 08:55					
Client ID:	Run ID: SV-6_352996	SeqNo: 5406171		PrepDate: 17-Dec-2019		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
1,4-Dioxane	0.010	0.010							U	
Surr: 2-Fluorobiphenyl	0.09654	0	0.08	0	121	40 - 140				
Surr: 4-Terphenyl-d14	0.09022	0	0.08	0	113	40 - 140				
Surr: Nitrobenzene-d5	0.08627	0	0.08	0	108	40 - 140				
LCS	Sample ID: LCS1-148814	Units: ug/L			Analysis Date: 20-Dec-2019 09:14					
Client ID:	Run ID: SV-6_352996	SeqNo: 5406172		PrepDate: 17-Dec-2019		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
1,4-Dioxane	0.1101	0.010	0.08	0	138	40 - 140				
Surr: 2-Fluorobiphenyl	0.09483	0	0.08	0	119	40 - 140				
Surr: 4-Terphenyl-d14	0.07915	0	0.08	0	98.9	40 - 140				
Surr: Nitrobenzene-d5	0.07534	0	0.08	0	94.2	40 - 140				
LCSD	Sample ID: LCSD1-148814	Units: ug/L			Analysis Date: 20-Dec-2019 09:33					
Client ID:	Run ID: SV-6_352996	SeqNo: 5406173		PrepDate: 17-Dec-2019		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
1,4-Dioxane	0.1039	0.010	0.08	0	130	40 - 140	0.1101	5.76	20	
Surr: 2-Fluorobiphenyl	0.07777	0	0.08	0	97.2	40 - 140	0.09483	19.8	20	
Surr: 4-Terphenyl-d14	0.07343	0	0.08	0	91.8	40 - 140	0.07915	7.49	20	
Surr: Nitrobenzene-d5	0.0755	0	0.08	0	94.4	40 - 140	0.07534	0.209	20	
The following samples were analyzed in this batch:										
HS19120843-01		HS19120843-04		HS19120843-05		HS19120843-06				

ALS Houston, US

Date: 31-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP/Site 18/24
WorkOrder: HS19120843

QC BATCH REPORT

Batch ID: R352800 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MBLK	Sample ID: VBLKW-191218	Units: UG/L			Analysis Date: 18-Dec-2019 11:47					
Client ID:	Run ID: VOA6_352800	SeqNo: 5400232	PrepDate:	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	1.0	2.0								U
Carbon tetrachloride	0.50	1.0								U
Chlorobenzene	0.50	1.0								U
Chloroethane	0.50	1.0								U
Chloroform	0.50	1.0								U
Chloromethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
cis-1,3-Dichloropropene	0.50	1.0								U
Dibromochloromethane	0.50	1.0								U
Dibromomethane	0.50	1.0								U
Dichlorodifluoromethane	0.50	1.0								U
Ethylbenzene	0.50	1.0								U
Hexachlorobutadiene	0.50	1.0								U
Isopropylbenzene	0.50	1.0								U
m,p-Xylene	1.0	2.0								U
Methylene chloride	1.0	2.0								U
Naphthalene	0.50	1.0								U
n-Butylbenzene	0.50	1.0								U
n-Propylbenzene	0.50	1.0								U
o-Xylene	0.50	1.0								U
sec-Butylbenzene	0.50	1.0								U
Styrene	0.50	1.0								U
tert-Butylbenzene	0.50	1.0								U
Tetrachloroethene	0.50	1.0								U
Toluene	0.50	1.0								U
trans-1,2-Dichloroethene	0.50	1.0								U
trans-1,3-Dichloropropene	0.50	1.0								U
Trichloroethene	0.50	1.0								U
Trichlorofluoromethane	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	45.92	1.0	50	0	91.8	81 - 118				
Surr: 4-Bromofluorobenzene	49.77	1.0	50	0	99.5	85 - 114				
Surr: Dibromofluoromethane	46.5	1.0	50	0	93.0	80 - 119				
Surr: Toluene-d8	50.66	1.0	50	0	101	89 - 112				

ALS Houston, US

Date: 31-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP/Site 18/24
WorkOrder: HS19120843

QC BATCH REPORT

Batch ID: R352800 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
LCS	Sample ID: VLCSW-191218	Units: UG/L			Analysis Date: 18-Dec-2019 10:59					
Client ID:	Run ID: VOA6_352800	SeqNo: 5400231	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	18.75	1.0	20	0	93.7	78 - 124				
1,1,1-Trichloroethane	18.87	1.0	20	0	94.4	74 - 131				
1,1,2,2-Tetrachloroethane	19.69	1.0	20	0	98.4	71 - 121				
1,1,2-Trichloroethane	19.07	1.0	20	0	95.4	80 - 119				
1,1-Dichloroethane	20.3	1.0	20	0	101	77 - 125				
1,1-Dichloroethene	15.99	1.0	20	0	80.0	71 - 131				
1,1-Dichloropropene	19.4	1.0	20	0	97.0	78 - 125				
1,2,3-Trichlorobenzene	26.44	1.0	20	0	132	69 - 129				S
1,2,3-Trichloropropane	20.04	1.0	20	0	100	73 - 122				
1,2,4-Trichlorobenzene	22.69	1.0	20	0	113	69 - 130				
1,2,4-Trimethylbenzene	20.2	1.0	20	0	101	76 - 124				
1,2-Dibromo-3-chloropropane	18.75	1.0	20	0	93.8	62 - 128				
1,2-Dibromoethane	18.78	1.0	20	0	93.9	77 - 121				
1,2-Dichlorobenzene	19.23	1.0	20	0	96.1	80 - 119				
1,2-Dichloroethane	18.47	1.0	20	0	92.4	73 - 128				
1,2-Dichloropropane	19.79	1.0	20	0	99.0	78 - 122				
1,3,5-Trimethylbenzene	20.83	1.0	20	0	104	75 - 124				
1,3-Dichlorobenzene	19.63	1.0	20	0	98.1	80 - 119				
1,3-Dichloropropane	19.15	1.0	20	0	95.7	80 - 119				
1,4-Dichlorobenzene	19.11	1.0	20	0	95.5	79 - 118				
2,2-Dichloropropane	19.07	1.0	20	0	95.3	60 - 139				
2-Butanone	39.23	2.0	40	0	98.1	56 - 143				
2-Chlorotoluene	21.21	1.0	20	0	106	79 - 122				
2-Hexanone	37	2.0	40	0	92.5	57 - 139				
4-Chlorotoluene	20.39	1.0	20	0	102	78 - 122				
4-Isopropyltoluene	20.29	1.0	20	0	101	77 - 127				
4-Methyl-2-pentanone	36.54	2.0	40	0	91.3	67 - 130				
Acetone	30.87	2.0	40	0	77.2	39 - 160				
Benzene	20.25	1.0	20	0	101	79 - 120				
Bromobenzene	20.24	1.0	20	0	101	80 - 120				
Bromochloromethane	19.52	1.0	20	0	97.6	78 - 123				
Bromodichloromethane	18.87	1.0	20	0	94.4	79 - 125				
Bromoform	17.75	1.0	20	0	88.8	66 - 130				
Bromomethane	15.81	1.0	20	0	79.1	53 - 141				

ALS Houston, US

Date: 31-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP/Site 18/24
WorkOrder: HS19120843

QC BATCH REPORT

Batch ID: R352800 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
LCS	Sample ID: VLCSW-191218	Units: UG/L			Analysis Date: 18-Dec-2019 10:59					
Client ID:	Run ID: VOA6_352800	SeqNo: 5400231	PrepDate:	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	43.34	2.0	40	0	108	64 - 133				
Carbon tetrachloride	17.84	1.0	20	0	89.2	72 - 136				
Chlorobenzene	18.81	1.0	20	0	94.1	82 - 118				
Chloroethane	16.01	1.0	20	0	80.0	60 - 138				
Chloroform	18.31	1.0	20	0	91.5	79 - 124				
Chloromethane	15.4	1.0	20	0	77.0	50 - 139				
cis-1,2-Dichloroethene	20.74	1.0	20	0	104	78 - 123				
cis-1,3-Dichloropropene	19.9	1.0	20	0	99.5	75 - 124				
Dibromochloromethane	18.71	1.0	20	0	93.6	74 - 126				
Dibromomethane	18.75	1.0	20	0	93.8	79 - 123				
Dichlorodifluoromethane	20.19	1.0	20	0	101	32 - 152				
Ethylbenzene	19.39	1.0	20	0	96.9	79 - 121				
Hexachlorobutadiene	23.7	1.0	20	0	118	66 - 134				
Isopropylbenzene	18.95	1.0	20	0	94.8	72 - 131				
m,p-Xylene	38.19	2.0	40	0	95.5	80 - 121				
Methylene chloride	19.55	2.0	20	0	97.7	74 - 124				
Naphthalene	20.36	1.0	20	0	102	61 - 128				
n-Butylbenzene	19.96	1.0	20	0	99.8	75 - 128				
n-Propylbenzene	20.64	1.0	20	0	103	76 - 126				
o-Xylene	18.95	1.0	20	0	94.8	78 - 122				
sec-Butylbenzene	20.35	1.0	20	0	102	77 - 126				
Styrene	18.94	1.0	20	0	94.7	78 - 123				
tert-Butylbenzene	20.49	1.0	20	0	102	78 - 124				
Tetrachloroethene	18.23	1.0	20	0	91.2	74 - 129				
Toluene	19.35	1.0	20	0	96.8	80 - 121				
trans-1,2-Dichloroethene	20.09	1.0	20	0	100	75 - 124				
trans-1,3-Dichloropropene	19.51	1.0	20	0	97.5	73 - 127				
Trichloroethene	19.41	1.0	20	0	97.1	79 - 123				
Trichlorofluoromethane	15.79	1.0	20	0	79.0	65 - 141				
Vinyl chloride	16.62	1.0	20	0	83.1	58 - 137				
Surr: 1,2-Dichloroethane-d4	48.27	1.0	50	0	96.5	81 - 118				
Surr: 4-Bromofluorobenzene	47.67	1.0	50	0	95.3	85 - 114				
Surr: Dibromofluoromethane	47.78	1.0	50	0	95.6	80 - 119				
Surr: Toluene-d8	44.63	1.0	50	0	89.3	89 - 112				

ALS Houston, US

Date: 31-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP/Site 18/24
WorkOrder: HS19120843

QC BATCH REPORT

Batch ID: R352800 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MS	Sample ID: HS19120843-04MS	Units: UG/L			Analysis Date: 18-Dec-2019 15:00					
Client ID: MW5_121319	Run ID: VOA6_352800	SeqNo: 5400240	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	19.65	1.0	20	0	98.2	78 - 124				
1,1,1-Trichloroethane	18.16	1.0	20	0	90.8	74 - 131				
1,1,2,2-Tetrachloroethane	20.5	1.0	20	0	102	71 - 121				
1,1,2-Trichloroethane	19.52	1.0	20	0	97.6	80 - 119				
1,1-Dichloroethane	21.61	1.0	20	3.014	93.0	77 - 125				
1,1-Dichloroethene	14.36	1.0	20	0	71.8	71 - 131				
1,1-Dichloropropene	19.43	1.0	20	0	97.1	78 - 125				
1,2,3-Trichlorobenzene	23.1	1.0	20	0	116	69 - 129				
1,2,3-Trichloropropane	21.01	1.0	20	0	105	73 - 122				
1,2,4-Trichlorobenzene	22.03	1.0	20	0	110	69 - 130				
1,2,4-Trimethylbenzene	22.53	1.0	20	0	113	76 - 124				
1,2-Dibromo-3-chloropropane	19.44	1.0	20	0	97.2	62 - 128				
1,2-Dibromoethane	18.67	1.0	20	0	93.4	77 - 121				
1,2-Dichlorobenzene	20.5	1.0	20	0	103	80 - 119				
1,2-Dichloroethane	17.54	1.0	20	0	87.7	73 - 128				
1,2-Dichloropropane	18.91	1.0	20	0	94.5	78 - 122				
1,3,5-Trimethylbenzene	23.05	1.0	20	0	115	75 - 124				
1,3-Dichlorobenzene	21.78	1.0	20	0	109	80 - 119				
1,3-Dichloropropane	19.64	1.0	20	0	98.2	80 - 119				
1,4-Dichlorobenzene	20.72	1.0	20	0	104	79 - 118				
2,2-Dichloropropane	18.12	1.0	20	0	90.6	60 - 139				
2-Butanone	32.03	2.0	40	0	80.1	56 - 143				
2-Chlorotoluene	23.54	1.0	20	0	118	79 - 122				
2-Hexanone	34.43	2.0	40	0	86.1	57 - 139				
4-Chlorotoluene	22.48	1.0	20	0	112	78 - 122				
4-Isopropyltoluene	22.68	1.0	20	0	113	77 - 127				
4-Methyl-2-pentanone	36.28	2.0	40	0	90.7	67 - 130				
Acetone	19.91	2.0	40	0	49.8	39 - 160				
Benzene	19.68	1.0	20	0	98.4	79 - 120				
Bromobenzene	21.64	1.0	20	0	108	80 - 120				
Bromochloromethane	17.62	1.0	20	0	88.1	78 - 123				
Bromodichloromethane	18.11	1.0	20	0	90.6	79 - 125				
Bromoform	17.87	1.0	20	0	89.4	66 - 130				
Bromomethane	9.649	1.0	20	0	48.2	53 - 141				S

ALS Houston, US

Date: 31-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP/Site 18/24
WorkOrder: HS19120843

QC BATCH REPORT

Batch ID: R352800 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MS	Sample ID: HS19120843-04MS	Units: UG/L			Analysis Date: 18-Dec-2019 15:00					
Client ID: MW5_121319	Run ID: VOA6_352800	SeqNo: 5400240	PrepDate:	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	32.22	2.0	40	0	80.6	64 - 133				
Carbon tetrachloride	18.3	1.0	20	0	91.5	72 - 136				
Chlorobenzene	19.75	1.0	20	0	98.7	82 - 118				
Chloroethane	11.1	1.0	20	0	55.5	60 - 138				S
Chloroform	17.4	1.0	20	0	87.0	79 - 124				
Chloromethane	5.644	1.0	20	0	28.2	50 - 139				S
cis-1,2-Dichloroethene	29.24	1.0	20	10.44	94.0	78 - 123				
cis-1,3-Dichloropropene	18.92	1.0	20	0	94.6	75 - 124				
Dibromochloromethane	19.14	1.0	20	0	95.7	74 - 126				
Dibromomethane	17.46	1.0	20	0	87.3	79 - 123				
Dichlorodifluoromethane	2.796	1.0	20	0	14.0	32 - 152				S
Ethylbenzene	20.99	1.0	20	0	105	79 - 121				
Hexachlorobutadiene	24.64	1.0	20	0	123	66 - 134				
Isopropylbenzene	20.88	1.0	20	0	104	72 - 131				
m,p-Xylene	41.15	2.0	40	0	103	80 - 121				
Methylene chloride	17.05	2.0	20	0	85.3	74 - 124				
Naphthalene	19.15	1.0	20	0	95.8	61 - 128				
n-Butylbenzene	22.43	1.0	20	0	112	75 - 128				
n-Propylbenzene	23.34	1.0	20	0	117	76 - 126				
o-Xylene	20.16	1.0	20	0	101	78 - 122				
sec-Butylbenzene	23.29	1.0	20	0	116	77 - 126				
Styrene	19.97	1.0	20	0	99.8	78 - 123				
tert-Butylbenzene	23.26	1.0	20	0	116	78 - 124				
Tetrachloroethene	20	1.0	20	0	100	74 - 129				
Toluene	20.73	1.0	20	0	104	80 - 121				
trans-1,2-Dichloroethene	18.32	1.0	20	0	91.6	75 - 124				
trans-1,3-Dichloropropene	18.08	1.0	20	0	90.4	73 - 127				
Trichloroethene	59.12	1.0	20	39.53	98.0	79 - 123				
Trichlorofluoromethane	12.16	1.0	20	0	60.8	65 - 141				S
Vinyl chloride	10.73	1.0	20	3.007	38.6	58 - 137				S
Surr: 1,2-Dichloroethane-d4	45.29	1.0	50	0	90.6	81 - 118				
Surr: 4-Bromofluorobenzene	49.02	1.0	50	0	98.0	85 - 114				
Surr: Dibromofluoromethane	46.59	1.0	50	0	93.2	80 - 119				
Surr: Toluene-d8	51.23	1.0	50	0	102	89 - 112				

ALS Houston, US

Date: 31-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP/Site 18/24
WorkOrder: HS19120843

QC BATCH REPORT

Batch ID: R352800 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MSD	Sample ID: HS19120843-04MSD	Units: UG/L			Analysis Date: 18-Dec-2019 15:24					
Client ID: MW5_121319	Run ID: VOA6_352800	SeqNo: 5400241	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	18.87	1.0	20	0	94.4	78 - 124	19.65	4.04	20	
1,1,1-Trichloroethane	17.82	1.0	20	0	89.1	74 - 131	18.16	1.87	20	
1,1,2,2-Tetrachloroethane	19.93	1.0	20	0	99.6	71 - 121	20.5	2.82	20	
1,1,2-Trichloroethane	19.38	1.0	20	0	96.9	80 - 119	19.52	0.74	20	
1,1-Dichloroethane	20.94	1.0	20	3.014	89.7	77 - 125	21.61	3.12	20	
1,1-Dichloroethene	14.15	1.0	20	0	70.8	71 - 131	14.36	1.45	20	S
1,1-Dichloropropene	19.03	1.0	20	0	95.1	78 - 125	19.43	2.07	20	
1,2,3-Trichlorobenzene	23.04	1.0	20	0	115	69 - 129	23.1	0.288	20	
1,2,3-Trichloropropane	20.52	1.0	20	0	103	73 - 122	21.01	2.35	20	
1,2,4-Trichlorobenzene	20.92	1.0	20	0	105	69 - 130	22.03	5.16	20	
1,2,4-Trimethylbenzene	21.48	1.0	20	0	107	76 - 124	22.53	4.78	20	
1,2-Dibromo-3-chloropropane	19.1	1.0	20	0	95.5	62 - 128	19.44	1.74	20	
1,2-Dibromoethane	18.54	1.0	20	0	92.7	77 - 121	18.67	0.717	20	
1,2-Dichlorobenzene	19.99	1.0	20	0	100.0	80 - 119	20.5	2.53	20	
1,2-Dichloroethane	17.2	1.0	20	0	86.0	73 - 128	17.54	1.97	20	
1,2-Dichloropropane	18.74	1.0	20	0	93.7	78 - 122	18.91	0.92	20	
1,3,5-Trimethylbenzene	22.32	1.0	20	0	112	75 - 124	23.05	3.23	20	
1,3-Dichlorobenzene	20.95	1.0	20	0	105	80 - 119	21.78	3.88	20	
1,3-Dichloropropane	19.09	1.0	20	0	95.4	80 - 119	19.64	2.85	20	
1,4-Dichlorobenzene	20.24	1.0	20	0	101	79 - 118	20.72	2.32	20	
2,2-Dichloropropane	17.66	1.0	20	0	88.3	60 - 139	18.12	2.59	20	
2-Butanone	32.67	2.0	40	0	81.7	56 - 143	32.03	2	20	
2-Chlorotoluene	22.49	1.0	20	0	112	79 - 122	23.54	4.56	20	
2-Hexanone	35.22	2.0	40	0	88.1	57 - 139	34.43	2.28	20	
4-Chlorotoluene	21.64	1.0	20	0	108	78 - 122	22.48	3.8	20	
4-Isopropyltoluene	22.16	1.0	20	0	111	77 - 127	22.68	2.34	20	
4-Methyl-2-pentanone	35.91	2.0	40	0	89.8	67 - 130	36.28	1.02	20	
Acetone	20.06	2.0	40	0	50.1	39 - 160	19.91	0.742	20	
Benzene	19.5	1.0	20	0	97.5	79 - 120	19.68	0.887	20	
Bromobenzene	20.71	1.0	20	0	104	80 - 120	21.64	4.4	20	
Bromochloromethane	17.66	1.0	20	0	88.3	78 - 123	17.62	0.213	20	
Bromodichloromethane	17.88	1.0	20	0	89.4	79 - 125	18.11	1.31	20	
Bromoform	17.89	1.0	20	0	89.4	66 - 130	17.87	0.0845	20	
Bromomethane	8.522	1.0	20	0	42.6	53 - 141	9.649	12.4	20	S

ALS Houston, US

Date: 31-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP/Site 18/24
WorkOrder: HS19120843

QC BATCH REPORT

Batch ID: R352800 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MSD	Sample ID: HS19120843-04MSD	Units: UG/L			Analysis Date: 18-Dec-2019 15:24					
Client ID: MW5_121319	Run ID: VOA6_352800	SeqNo: 5400241	PrepDate:	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	31.34	2.0	40	0	78.3	64 - 133	32.22	2.78	20	
Carbon tetrachloride	18	1.0	20	0	90.0	72 - 136	18.3	1.69	20	
Chlorobenzene	18.96	1.0	20	0	94.8	82 - 118	19.75	4.04	20	
Chloroethane	10.86	1.0	20	0	54.3	60 - 138	11.1	2.26	20	S
Chloroform	17.23	1.0	20	0	86.2	79 - 124	17.4	0.934	20	
Chloromethane	5.204	1.0	20	0	26.0	50 - 139	5.644	8.12	20	S
cis-1,2-Dichloroethene	28.77	1.0	20	10.44	91.7	78 - 123	29.24	1.61	20	
cis-1,3-Dichloropropene	18.87	1.0	20	0	94.3	75 - 124	18.92	0.258	20	
Dibromochloromethane	18.67	1.0	20	0	93.3	74 - 126	19.14	2.53	20	
Dibromomethane	17.43	1.0	20	0	87.1	79 - 123	17.46	0.18	20	
Dichlorodifluoromethane	2.753	1.0	20	0	13.8	32 - 152	2.796	1.55	20	S
Ethylbenzene	19.88	1.0	20	0	99.4	79 - 121	20.99	5.39	20	
Hexachlorobutadiene	21.88	1.0	20	0	109	66 - 134	24.64	11.8	20	
Isopropylbenzene	19.98	1.0	20	0	99.9	72 - 131	20.88	4.4	20	
m,p-Xylene	40.19	2.0	40	0	100	80 - 121	41.15	2.36	20	
Methylene chloride	16.82	2.0	20	0	84.1	74 - 124	17.05	1.39	20	
Naphthalene	19.52	1.0	20	0	97.6	61 - 128	19.15	1.92	20	
n-Butylbenzene	22.01	1.0	20	0	110	75 - 128	22.43	1.91	20	
n-Propylbenzene	22.46	1.0	20	0	112	76 - 126	23.34	3.82	20	
o-Xylene	19.26	1.0	20	0	96.3	78 - 122	20.16	4.59	20	
sec-Butylbenzene	22.44	1.0	20	0	112	77 - 126	23.29	3.7	20	
Styrene	19.35	1.0	20	0	96.7	78 - 123	19.97	3.17	20	
tert-Butylbenzene	22.27	1.0	20	0	111	78 - 124	23.26	4.33	20	
Tetrachloroethene	19.11	1.0	20	0	95.5	74 - 129	20	4.6	20	
Toluene	19.96	1.0	20	0	99.8	80 - 121	20.73	3.79	20	
trans-1,2-Dichloroethene	18.21	1.0	20	0	91.0	75 - 124	18.32	0.603	20	
trans-1,3-Dichloropropene	18.01	1.0	20	0	90.0	73 - 127	18.08	0.402	20	
Trichloroethene	58.33	1.0	20	39.53	94.0	79 - 123	59.12	1.34	20	
Trichlorofluoromethane	11.92	1.0	20	0	59.6	65 - 141	12.16	1.95	20	S
Vinyl chloride	10.48	1.0	20	3.007	37.4	58 - 137	10.73	2.33	20	S
Surr: 1,2-Dichloroethane-d4	45.17	1.0	50	0	90.3	81 - 118	45.29	0.275	20	
Surr: 4-Bromofluorobenzene	50.31	1.0	50	0	101	85 - 114	49.02	2.6	20	
Surr: Dibromofluoromethane	46.44	1.0	50	0	92.9	80 - 119	46.59	0.324	20	
Surr: Toluene-d8	50.11	1.0	50	0	100	89 - 112	51.23	2.21	20	

ALS Houston, US

Date: 31-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP/Site 18/24
WorkOrder: HS19120843

QC BATCH REPORT**Batch ID:** R352800 (0)**Instrument:** VOA6**Method:** VOLATILES ORGANICS BY METHOD
8260C

The following samples were analyzed in this batch:

HS19120843-02	HS19120843-03	HS19120843-04	HS19120843-06
HS19120843-07			

ALS Houston, US

Date: 31-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP/Site 18/24
WorkOrder: HS19120843

**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 Quantitation 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	19-028-0	27-Mar-2020
California	2919, 2019-2020	30-Apr-2020
Dept of Defense	ANAB L2231	20-Dec-2021
Florida	E87611-28	30-Jun-2020
Illinois	2000322019-2	09-May-2020
Kansas	E-10352 2019-2020	31-Jul-2020
Kentucky	123043, 2019-2020	30-Apr-2020
Louisiana	03087, 2019-2020	30-Jun-2020
Maryland	343, 2019-2020	30-Jun-2020
North Dakota	R-193 2019-2020	30-Apr-2020
Oklahoma	2019-067	31-Aug-2020
Texas	TX104704231-19-23	30-Apr-2020

Sample Receipt Checklist

Client Name: Bhate Environmental
 Work Order: HS19120843

Date/Time Received: **14-Dec-2019 09:30**
 Received by: **JRM**

Checklist completed by: Paresh M. Giga 16-Dec-2019
 eSignature Date

Reviewed by: RJ Modashia 16-Dec-2019
 eSignature Date

Matrices: **GW/Water**

Carrier name: **FedEx**

- 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 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):

2.2c U/C	IR11
----------	------

Cooler(s)/Kit(s):

44259

Date/Time sample(s) sent to storage:

12/14/19 18:00

- 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:

--



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: NW01312.0150
 COC Number(1): _____
 LIMS Number: HS19120843

Facility/Base I.D.: LHAAP							Sample Analysis Requested ⁽⁵⁾										Quality Assurance Samples ⁽⁶⁾						
Project/Site Name: LHAAP / Site 18/24							Number of containers	VOC	PERCHLORATE	TOTAL METALS	1, 4 - DIOXANE									Ambient Blank Lot Control Number	Equipment Blank Lot Control Number	Trip Blank Lot Control Number	Cooler ID
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 ⁽¹⁾	Sample Number ⁽³⁾	Sample Matrix ⁽⁴⁾																	
18CPTMW16-121319	13 Dec 2019	0755	-	N	WG	2	X	X	X														
AWD3-121319	13 Dec 2019	0850	-	N	WG	5	X	X	X														
AWD3-121319-a	13 Dec 2019	0850	-	FD	WG	5	X	X	X														
MW5-121319	13 Dec 2019	0940	-	N	WG	6	X	X	X	X													
18CPTMW08DW-121319	13 Dec 2019	1025	-	N	WG	2	X	X	X														
18CPTMW08SW-121319	13 Dec 2019	1110	-	N	WG	5	X	X	X														
TR: p B Blank	13 Dec 2019		-	TB	W	2	X																


HS19120843
 Bhate Environmental Associates, Inc.
 LHAAP/Site 18/24

COMMENTS:

Custody Transfers Prior to Receipt by Laboratory			Sample Delivery Details / Laboratory Receipt		
Relinquished By (Signed)	Date	Time	Received by (signed)	Date	Time
<i>Scott Beesinger</i>	12/13/19	1145	<i>J. Munn</i>	12/14/19	09:30
2. _____			2. _____		
3. _____			3. _____		
Delivered Directly to Lab: _____			Shipped _____ No.:		
Method of Shipment: _____			Number: _____		
Fed _____ Ex _____ Airbill _____			Analytical Lab: ALS 10450 Stancliff Rd. Suite 210 Houston, TX 77099 (281) 530-5656		
ATTN: SONIA WEST			Lab Recipient: _____ Delivery Date/Time: _____		

1.) Chain of Custody Number = date collected + custody number (e.g. 09-02-1999-01)
 2.) Sample Type (SA) Codes: N = Normal Sample, TB = Trip Blank (-c) Sample, FD = Field Duplicate (-a) Samples, FR = Field Replicate (-b) Samples, EB = Equipment Blank (-d) Samples, MS = Matrix Spike, SD = Matrix Spike Duplicate, AB = Ambient Blank (-e)
 3.) Sample Number: Unique sample number collected from a particular location per day. (e.g. Groundwater sample collected from MW-1 on 10/10/99 = 01, if sampled again on 10/10/99 = 02, etc.)
 4.) Matrix Codes: GS = Soil Gas, WG = Groundwater, WS = Surface Water, SO = Soil, SE = Sediment, SL = Sludge, SS = Surface Soil Samples, WQ = Aqueous Blank Samples (trip, equipment, ambient, etc), SQ = Soil Blanks
 5.) Sample Analysis Requested: Analytical method requested and number of containers provided for each.
 6.) Quality assurance samples are assigned by date (ddmmyy) and the sample number associated with the sample (01, 02, etc) (e.g. Equipment blank collected in association with MW-1 on 10/10/99 will be designated 10109901 in the Equipment Blank Lot Control

*Cooler - 44257
 Temp 2.2
 12/11
 CFOO*

 ALS 10450 Stancliff Rd., Suite 210 Houston, Texas 77099 Tel. +1 281 530 5656 Fax. +1 281 530 5887	CUSTODY SEAL		Seal Broken By: <i>SM</i>
	Date: <i>12/13/19</i>	Time: <i>11:00</i>	Date:
	Name: <i>Scott Beesinger</i>	Company: <i>BHATE</i>	<i>12/14/19</i>

44257 DEC 14 2019



Must Deliver Next Business Day
Time and Temperature Sensitive!

44257

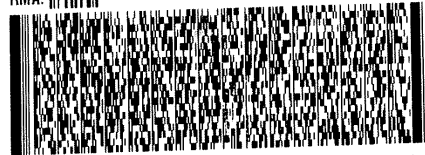
ORIGIN ID:SGRA (903) 930-6193
SCOTT BEESINER
BHATE ENVIRONMENTAL ASSOCIATES
1203-B EAST GRAND AVE. PHB202
MARSHALL, TX 75670
UNITED STATES US

SHIP DATE: 02DEC19
ACTWGT: 11.00 LB MAN
CAD: 300180/CAFE3211
DIMS: 26x14x14 IN

TO **CLIENT SERVICES**
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON TX 77099

(281) 530-5656
REF: LHAAP-18/24-BO 68900-RJ

RMA: ||| ||| |||



FedEx
Express



FedEx
1231 0292 4173

SATURDAY 12:00P
PRIORITY OVERNIGHT

XO SGRA

77099
TX-US
IAH



162/05 13DEC19 G6GA 56AC2/1800/85A2



Case Narrative

Method: 6850
Analysis: Perchlorate
Analysis SOP: LC-MS-CLO4
ALS WO ID(s): 1934851; 1935316; 1935343

Client: ALS Laboratories (Houston, TX)
Matrix: Water
ELMS Batch (HBN): 2330 (254116)

General Set Information: There were seventeen field samples in these Work Orders. The samples were analyzed for perchlorate.

Method Summary: Each sample was prepared as noted below and analyzed using an Agilent 1100 LC/MSD system in select ion monitoring (SIM) mode at m/z 83 and 85, which corresponds to the loss of one oxygen atom from the perchlorate molecule. ChemStation software was used for instrument control and data analysis. The ion ratio of m/z 83 to 85 was used to positively identify the response peak as perchlorate. Quantitation was performed using the m/z 83 peak area. An internal standard (ISTD) of ^{18}O labeled perchlorate was added to each sample to establish the perchlorate peak retention time and used in quantitation.

Sample Preparation: A 10.0mL aliquot of each sample was transferred into a 15-mL centrifuge tube. 50 μL of an ^{18}O labeled perchlorate solution was added to each sample as an internal standard. The samples were then capped, vortexed, and filtered into autosampler vial using Phenex PES membrane 0.45 μm Syringe filters.

Holding Times: Holding times were met for all analyses.

Dilutions: Field sample 1934851007 was analyzed and reported from a 1:100 dilution. Field sample 1935343005 was analyzed and reported from a 1:10 dilution. Field samples 1935343004/06 were analyzed and reported from 1:1,000 dilutions. The reporting limits have been adjusted accordingly.

Method QC data: The method blank (LMB 689411) was less than 1/2 the CRDL. The recovery for the LCS (689408) was within acceptable parameters.



MS/MSD Analysis: MS/MSD was performed on sample 1934851001 (Client ID: MW19_120919). 3.0 μ L of Working Standard Solution Horizon ID 49947 was added to 10.0mL of sample preparation. The spike target was 3. μ g/L. The MS/MSD percent recoveries and relative percent difference (RPD) were within the performance limits.

Instrument QC: Instrument initial and continuing calibrations were performed in accordance with published procedures.

NC/CAR(s): NA

Sample Calculation: Samples were reported in μ g/L. Results were calculated in μ g/L by the equation (A)x(B),

where: A = Analyte concentration from the standard curve (μ g/L)

B = Dilution performed at time of analysis

Miscellaneous Comments: These samples were analyzed in accordance with the requirements found in the DOD QSM Version 5.1.1. The Reporting Limit Verification Standard (RLVS – 689409) is reported from the analysis of the Laboratory Control Sample (LCS – 689408) at a level of 3.0 μ g/L. Due to limitations of the Chemstation Software, some of the chromatographic peaks may require manual integrations. A manual integration was performed for one of the Initial Calibration analyses (datafile: 20SEPI03) along with datafiles 20DEC19D14/16/18/19.

Thomas Bosch December 23, 2019
Analyst Date



ANALYTICAL REPORT

Report Date: December 23, 2019

RJ Modashia
ALS Environmental (Houston)
10450 Stancliff Road
Suite 210
Houston, TX 77099

Phone: 281 530-5656

E-mail: RJ.Modashia@ALSGlobal.com

Workorder: **34-1935343**

Project ID: HS19120843

Purchase Order: HS19120843

Project Manager Kevin W. Griffiths

Client Sample ID	Lab ID	Collect Date	Receive Date	Sampling Site
18CpTMW16_121319	1935343001	12/13/19	12/17/19	
AWD3_121319	1935343002	12/13/19	12/17/19	
AWD3_121319_a	1935343003	12/13/19	12/17/19	
MW5_121319	1935343004	12/13/19	12/17/19	
18CpTMW08DW_121319	1935343005	12/13/19	12/17/19	
18CpTMW08SW_121319	1935343006	12/13/19	12/17/19	



ANALYTICAL REPORT

Workorder: **34-1935343**Client: ALS Environmental
(Houston)

Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: 18CpTMW16_121319	Sampling Site: NA	Collected: 12/13/2019				
Lab ID: 1935343001	Media: 125 mL Nalgene	Received: 12/17/2019				
Matrix: Water	Sampling Parameter: NA					
Analysis Method - EPA 6850, DoD QSM						
Preparation: Not Applicable	Analysis: EPA 6850, DoD QSM Water Batch: ELMS/2330 (HBN: 254116) Analyzed: 12/20/2019 17:30	Instrument ID: LCMS04 %Solids: NA Report Basis: Wet				
Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Sample ID: AWD3_121319	Sampling Site: NA	Collected: 12/13/2019				
Lab ID: 1935343002	Media: 125 mL Nalgene	Received: 12/17/2019				
Matrix: Water	Sampling Parameter: NA					
Analysis Method - EPA 6850, DoD QSM						
Preparation: Not Applicable	Analysis: EPA 6850, DoD QSM Water Batch: ELMS/2330 (HBN: 254116) Analyzed: 12/20/2019 17:44	Instrument ID: LCMS04 %Solids: NA Report Basis: Wet				
Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	32	1.0	2.0	4.0	1	

Sample ID: AWD3_121319_a	Sampling Site: NA	Collected: 12/13/2019				
Lab ID: 1935343003	Media: 125 mL Nalgene	Received: 12/17/2019				
Matrix: Water	Sampling Parameter: NA					
Analysis Method - EPA 6850, DoD QSM						
Preparation: Not Applicable	Analysis: EPA 6850, DoD QSM Water Batch: ELMS/2330 (HBN: 254116) Analyzed: 12/20/2019 17:58	Instrument ID: LCMS04 %Solids: NA Report Basis: Wet				
Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	29	1.0	2.0	4.0	1	

Sample ID: MW5_121319	Sampling Site: NA	Collected: 12/13/2019				
Lab ID: 1935343004	Media: 125 mL Nalgene	Received: 12/17/2019				
Matrix: Water	Sampling Parameter: NA					
Analysis Method - EPA 6850, DoD QSM						
Preparation: Not Applicable	Analysis: EPA 6850, DoD QSM Water Batch: ELMS/2330 (HBN: 254116) Analyzed: 12/20/2019 18:12	Instrument ID: LCMS04 %Solids: NA Report Basis: Wet				
Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	32000	1000	2000	4000	1000	



ANALYTICAL REPORT

Workorder: 34-1935343

Client: ALS Environmental
(Houston)

Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: 18CpTMW08DW_121319	Sampling Site: NA	Collected: 12/13/2019				
Lab ID: 1935343005	Media: 125 mL Nalgene	Received: 12/17/2019				
Matrix: Water	Sampling Parameter: NA					
Analysis Method - EPA 6850, DoD QSM						
Preparation: Not Applicable	Analysis: EPA 6850, DoD QSM Water Batch: ELMS/2330 (HBN: 254116) Analyzed: 12/20/2019 18:25	Instrument ID: LCMS04 %Solids: NA Report Basis: Wet				
Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	310	10	20	40	10	

Sample ID: 18CpTMW08SW_121319	Sampling Site: NA	Collected: 12/13/2019				
Lab ID: 1935343006	Media: 125 mL Nalgene	Received: 12/17/2019				
Matrix: Water	Sampling Parameter: NA					
Analysis Method - EPA 6850, DoD QSM						
Preparation: Not Applicable	Analysis: EPA 6850, DoD QSM Water Batch: ELMS/2330 (HBN: 254116) Analyzed: 12/20/2019 18:39	Instrument ID: LCMS04 %Solids: NA Report Basis: Wet				
Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	24000	1000	2000	4000	1000	

Comments

Quality Control: EPA 6850, DoD QSM - (HBN: 254116)

Field sample 1934851007 was analyzed and reported from a 1:100 dilution. Field sample 1935343005 was analyzed and reported from a 1:10 dilution. Field samples 1935343004/06 were analyzed and reported from 1:1,000 dilutions. The reporting limits have been adjusted accordingly.

Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Method	Analyst	Peer Review
EPA 6850, DoD QSM	/S/ Thomas Bosch 12/23/2019 10:15	/S/ Stephen Brose 12/23/2019 13:19

Laboratory Contact Information

ALS Environmental
960 W Levoy Drive
Salt Lake City, Utah 84123

Phone: (801) 266-7700
Email: als@t.lab@ALSGlobal.com
Web: www.als@slc.com



ANALYTICAL REPORT

Workorder: 34-1935343

Client: ALS Environmental
(Houston)

Project Manager: Kevin W. Griffiths

General Lab Comments

The results provided in this report relate only to the items tested.
 Samples were received in acceptable condition unless otherwise noted.
 Samples have not been blank corrected unless otherwise noted.
 This test report shall not be reproduced, except in full, without written approval of ALS.

ALS provides professional analytical services for all samples submitted. ALS is not in a position to interpret the data and assumes no responsibility for the quality of the samples submitted.

All quality control samples processed with the samples in this report yielded acceptable results unless otherwise noted.

ALS is accredited for specific fields of testing (scopes) in the following testing sectors. The quality system implemented at ALS conforms to accreditation requirements and is applied to all analytical testing performed by ALS. The following table lists testing sector, accreditation body, accreditation number and website. Please contact these accrediting bodies or your ALS project manager for the current scope of accreditation that applies to your analytical testing.

Testing Sector	Accreditation Body (Standard)	Certificate Number	Website
Environmental	PJLA (DoD ELAP)	L17-506	http://www.pjlabs.com
	PJLA (ISO 17025)	L17-507-R1	http://www.pjlabs.com
	Utah (TNI)	UT00953	http://lams.nelac-institute.org/search
	Iowa (TNI)	IA# 376	http://www.shl.uiowa.edu/labcert/idnr/
	Kansas	E-10416	http://www.kdheks.gov/envlab/disclaimer.html
Industrial Hygiene	AIHA (ISO 17025 & AIHA IHLAP)	101574	http://www.aihaaccreditedlabs.org
	DOECAP-AP	L18-606	http://www.pjlabs.com
	Washington	C596	https://ecology.wa.gov/Regulations-Permits/Permits-certifications/Laboratory-Accreditation
Dietary Supplements	PJLA (ISO 17025)	L17-507-R1	http://www.pjlabs.com

Result Symbol Definitions

MDL = Method Detection Limit, a statistical estimate of method/media/instrument sensitivity.

RL = Reporting Limit, a verified value of method/media/instrument sensitivity.

CRDL = Contract Required Detection Limit

Reg. Limit = Regulatory Limit.

ND = Not Detected, testing result not detected above the MDL or RL.

< Means this testing result is less than the numerical value.

** No result could be reported, see sample comments for details.

Qualifier Symbol Definitions

U = Qualifier indicates that the analyte was not detected above the MDL.

J = Qualifier Indicates that the analyte value is between the MDL and the RL. It is also used to indicate an estimated value for tentatively identified compounds in mass spectrometry where a 1:1 response is assumed.

B = Qualifier indicates that the analyte was detected in the blank.

E = Qualifier indicates that the analyte result exceeds calibration range.

P = Qualifier indicates that the RPD between the two columns is greater than 40%.



Quality Control Sample Batch Report

00958326

Analysis Information

Workorder: 1935343

Limits: Client SOW/Contract Specified
Basis: DoD QSM

Preparation: NA
Batch: NA
Prepared By: NA

Analysis: EPA 6850, DoD QSM
Batch: ELMS/2330 (HBN: 254116)
Analyzed By: Thomas Bosch

Blank

LMB: 689411 Analyzed: 12/20/2019 14:02 Units: ug/L			
Analyte	Result	MDL	RL
Perchlorate	ND	1	2.00

Laboratory Control Sample

LCS: 689408 Analyzed: 12/20/2019 13:34 Dilution: 1 Units: ug/L				
Analyte	Result	Target	% Rec	QC Limits
Perchlorate	3.31	3.00	110	78.8 123.8

Matrix Spike - Matrix Spike Duplicate

Sample: 1934851001 Analyzed: 12/20/2019 14:15 Dilution: 1 Units: ug/L		MS: 689412 Analyzed: 12/20/2019 14:29 Dilution: 1 Units: ug/L				MSD: 689413 Analyzed: 12/20/2019 14:43 Dilution: 1 Units: ug/L			
Analyte	Result	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits
Perchlorate	ND	2.84	3	94.6	78.8 123.8	2.81	93.7	0.934	0.0 20.0

Comments

Field sample 1934851007 was analyzed and reported from a 1:100 dilution. Field sample 1935343005 was analyzed and reported from a 1:10 dilution. Field samples 1935343004/06 were analyzed and reported from 1:1,000 dilutions. The reporting limits have been adjusted accordingly.

QC Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Analyst	Peer Review
/S/ Thomas Bosch 12/23/2019 10:57	/S/ Stephen Brose 12/23/2019 13:19

Symbols and Definitions

- * - Analyte above reporting limit or outside of control limits
- ▲ - Sample result is greater than 4 times the spike added
- - Sample and Matrix Duplicate less than 5 times the reporting limit
- - Result is above the calibration range
- # - The Matrix Spike, Matrix Spike duplicate or Matrix Duplicate is reported for your information only. The sample matrix may be inappropriate for the method selected.

- RPD - Relative % Difference (Spike / Spike Duplicate)
- ND - Not Detected (U - Qualifier also flags analyte as not detected)
- NA - Not Applicable
- QC results are not adjusted for moisture correction, where applicable



1935343

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

18698/#2

SAMPLING STATE: Texas

COC ID: 12868

SUBCONTRACT TO:

ALS Laboratory Group
960 LeVoy Dr
Salt Lake City, UT 84123

1935343

Phone: +1 801 266 7700

CUSTOMER INFORMATION:

Company: ALS Houston
Contact: RJ Modashia
Address: 10450 Stancliff Rd, Ste 210
Phone: +1 281 530 5656
Email: RJ.Modashia@alsglobal.com
Alternate Contact:
Email:

INVOICE INFORMATION:

Company: ALS Houston
Contact: Accounts Payable
Address: 10450 Stancliff Rd, Ste 210
Phone: +1 281 530 5656
Reference: HS19120843
TSR: Danielle Winnings

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	HS19120843-01	18CpTMW16_121319	Groundwater	13 Dec 2019 07:55
	SUB_Perch-6850			24 Dec 2019
2.	HS19120843-02	AWD3_121319	Groundwater	13 Dec 2019 08:50
	SUB_Perch-6850			24 Dec 2019
3.	HS19120843-03	AWD3_121319_a	Groundwater	13 Dec 2019 08:50
	SUB_Perch-6850			24 Dec 2019
4.	HS19120843-04	MW5_121319	Groundwater	13 Dec 2019 09:40
	SUB_Perch-6850			24 Dec 2019
5.	HS19120843-05	18CpTMW08DW_121319	Groundwater	13 Dec 2019 10:25
	SUB_Perch-6850			24 Dec 2019
6.	HS19120843-06	18CpTMW08SW_121319	Groundwater	13 Dec 2019 11:10
	SUB_Perch-6850			24 Dec 2019

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

QC Level: DOD IV (DoD Data Package)

ALS GLOBAL INC. | 10450 STANCLIFF RD, STE 210, HOUSTON, TX 77099



Subcontract Chain of Custody

SAMPLING STATE: Texas

COC ID: 12868

Relinquished By: _____ *[Signature]*

Date/Time: _____ 12/16/19 1800

Received By: _____

Date/Time: _____

Cooler ID(s): _____

Temperature(s): _____



ALS Environmental CHAIN-OF-CUSTODY

Project / Job / Task: HS19120843		Split:		Workorder ID: 1935343		Level: ENV_LVL4		Requested Analysis	
Client: ALS Environmental (Houston)		Account: 8101		Type: 125Poly		EPA 6850, D+D GSM			
Comments:									
Item	Collect Date/Time	Sample ID	Lab ID	QC	Matrix	ID(s)	Containers	Count	
1	12/13/2019 07:55	18CPTMMW16_121319	1935343001		Water	A		1	
2	12/13/2019 08:50	AWD3_121319	1935343002		Water	A		1	
3	12/13/2019 08:50	AWD3_121319_a	1935343003		Water	A		1	
4	12/13/2019 09:40	MW5_121319	1935343004		Water	A		1	
5	12/13/2019 10:25	18CPTMMW08DW_121319	1935343005		Water	A		1	
6	12/13/2019 11:10	18CPTMMW08SW_121319	1935343006		Water	A		1	
7									
8									
9									
10									

ORIGINAL FIELD SAMPLE CHAIN-OF-CUSTODY				
Relinquished By: (Signature) <i>Warith/Julie</i>	Date / Time 12/17/2019 09:06	Received By: (Signature) ALS Sample Receiving	Reason for Transfer / Storage Location Sample Login	Sample Prep / Analysis for: _____ Lab Notebook No.: _____
<i>Julie Warith</i>	<i>12/19/1400</i>	<i>ic</i>	<i>storage</i>	Prepared / Analyzed by: _____ Date / Time: _____
<i>R-33.1</i>	<i>12/20/19/08.45</i>	<i>T. Board</i>	<i>clof analysis</i>	Relinquished By: (Signature) _____ Date / Time _____
				Received By: (Signature) _____ Date / Time _____
				Reason for Transfer / Storage Location _____

ALS-SALT LAKE CITY-RELATED INFORMATION REPORT (CRIR)

COOLER OR CONTAINER INFORMATION CHECKLIST (Fill In or Circle)

Client Name: ALS Houston Project/Task/Site: 1935343
 Date/Time of Receipt: 2/17/19 900 Number of Coolers Received: 1

Condition of Coolers: Acceptable/Unacceptable Temperature Control: Present/Not Included
 Cooler Custody Seals: Present/Absent/NA
 Intact/Broken/NA Location Temp Taken: Control/Between Samples
 Container Custody Seals: Present/Absent/NA
 Intact/Broken/NA Are all temperatures within project specific guidelines? Yes/No/NA
 Ice Present: Yes/No/NA VOA Headspace Present? Yes/No/NA
 Frozen/Melted/NA

pH Check Performed:	Metals	Yes/No/NA	Total Phenolics	Yes/No/NA	NO3/NO2	Yes/No/NA
	Cyanide	Yes/No/NA	TPH - 418.1	Yes/No/NA	Oil & Grease	Yes/No/NA
	Sulfide	Yes/No/NA	COD	Yes/No/NA	Total Phosphorous	Yes/No/NA
	Ammonia	Yes/No/NA	TKN	Yes/No/NA	Gross A.B, Gamma Spec	Yes/No/NA

Cooler Received	Cooler Condition	Temp.	Cooler Received	Cooler Condition	Temp.	Cooler Received	Cooler Condition	Temp.
1	<u>good</u>	<u>2</u> °C	4		°C	7		°C
2		°C	5		°C	8		°C
3		°C	6		°C	9		°C

Taken By: [Signature] [Signature] [Signature]
 Signature Printed Name Date

CLIENT-RELATED INFORMATION

- | | | | |
|--|---|--|---|
| <input type="checkbox"/> Missing Cooler | <input type="checkbox"/> Missing Samples/Bottles | <input type="checkbox"/> Incorrect Preservation | <input type="checkbox"/> Insufficient Sample Volume |
| <input type="checkbox"/> Cooler Conditions | <input type="checkbox"/> Broken/Leaking Samples | <input type="checkbox"/> pH Criteria Not Met | <input type="checkbox"/> Chain of Custody Problems |
| <input type="checkbox"/> Missing Paperwork | <input type="checkbox"/> Incorrect Bottle Type | <input type="checkbox"/> Residual Chlorine Present | <input type="checkbox"/> Other: |
| <input type="checkbox"/> Missing/Incorrect Bottle Labels | <input type="checkbox"/> Cooler Temperatures Out of Range | <input type="checkbox"/> Head Space in Bottles | |

BRIEFLY DESCRIBE THE PROBLEM AND THE ACTION TAKEN:

Client Notified? Yes No

Response Required Within 24 Hours

PROJECT MANAGEMENT

PROJECT MANAGER COMMENTS:

ALS Project Manager: _____ Returned to Sample Receipt by: _____ Date: _____
 Printed Name Signature

Must Deliver Next Business Day
Time and Temperature Sensitive!



ORIGIN ID:SGRA (281) 530-5656
CLIENT SERVICES
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON, TX 77099
UNITED STATES US

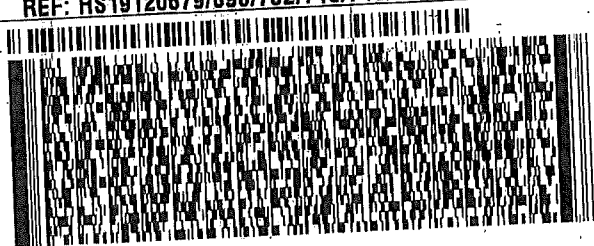
SHIP DATE: 16DEC19
ACTWGT: 47.30 LB
CAD: 300130/CAFE3211
DIMS: 26x14x14 IN
BILL THIRD PARTY

TO **SAMPLE RECEIVING
ALS ENVIRONMENTAL
960 W. LEVOY DRIVE**

SALT LAKE CITY UT 84123

(801) 288-7700

REF: HS19120679/696/702/715/745/765/843/844 --



**FedEx
Express**



JT81118060014

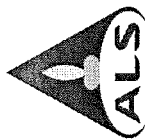
TRK# 1251 0292 9451
0201

**TUE - 17 DEC 3:00P
STANDARD OVERNIGHT**

AX BTFA

**84123
UT-US SLC**





Batch Worklist

HBN: 254116

Instrument:

Created: 12/20/2019 13:12

Batch: ELMS/2330



Status: WP

Analyst: T. Bosch

Rule: EPA 6850, DoD QSM Water

Workorder: 1934851 [ENV_LVL4]

Workorder: 1935316 [ENV_LVL4]

Workorder: 1935343 [ENV_LVL4]

Pos	Lab ID	Sample ID	Prep Initial	Prep Final	Dust Weight	Type	Mx	Container	Procedure	Mgr	Expire Date	Due Date	Run Date
1	689407	CCV for HBN 254116 [ELMS/2330]				CCV	3		E685041C3Q	5311		12/27/2019	
2	689408	LCS for HBN 254116 [ELMS/2330]				LCS	3		E6850Q413Q	5311		12/27/2019	
3	689409	RLVS for HBN 254116 [ELMS/2330]				RLVS	3		E685041C3Q	5311		12/27/2019	
4	689410	ICS for HBN 254116 [ELMS/2330]				ICS	3		E6850.D3Q	5311		12/27/2019	
5	689411	LMB for HBN 254116 [ELMS/2330]				LMB	3		E6850Q413Q	5311		12/27/2019	
6	1934851001	MW19_120919				SAMPLE	3	1934851001-A	E6850Q41.3	5480	1/6/2020	12/27/2019	
7	689412	MW19_120919(1934851001MS)				MS	3		E6850Q413Q	5311		12/27/2019	
8	689413	MW19_120919(1934851001MSD)				MSD	3		E6850Q413Q	5311		12/27/2019	
9	1934851002	18WW10_120919				SAMPLE	3	1934851002-A	E6850Q41.3	5480	1/6/2020	12/27/2019	
10	1934851003	18WW06_120919				SAMPLE	3	1934851003-A	E6850Q41.3	5480	1/6/2020	12/27/2019	
11	1934851004	18WW02_120919				SAMPLE	3	1934851004-A	E6850Q41.3	5480	1/6/2020	12/27/2019	
12	1934851005	MW16_120919				SAMPLE	3	1934851005-A	E6850Q41.3	5480	1/6/2020	12/27/2019	
13	1934851006	18CPTMW23_120919				SAMPLE	3	1934851006-A	E6850Q41.3	5480	1/6/2020	12/27/2019	
14	1934851007	18CPTMW14_120919				SAMPLE	3	1934851007-A	E6850Q41.3	5480	1/6/2020	12/27/2019	
15	1935316001	MW2_121319				SAMPLE	3	1935316001-A	E6850Q41.3	5480	1/10/2020	12/31/2019	
16	689414	CCV for HBN 254116 [ELMS/2330]				CCV	3		E685041C3Q	5311		12/27/2019	
17	1935316002	MW2_121319_a				SAMPLE	3	1935316002-A	E6850Q41.3	5480	1/10/2020	12/31/2019	
18	1935316003	18CPTMW01SW_121319				SAMPLE	3	1935316003-A	E6850Q41.3	5480	1/10/2020	12/31/2019	
19	1935316004	AWD1_121319				SAMPLE	3	1935316004-A	E6850Q41.3	5480	1/10/2020	12/31/2019	
20	1935343001	18CpTMW16_121319				SAMPLE	3	1935343001-A	E6850Q41.3	5480	1/10/2020	12/31/2019	
21	1935343002	AWD3_121319				SAMPLE	3	1935343002-A	E6850Q41.3	5480	1/10/2020	12/31/2019	
22	1935343003	AWD3_121319_a				SAMPLE	3	1935343003-A	E6850Q41.3	5480	1/10/2020	12/31/2019	
23	1935343004	MW5_121319				SAMPLE	3	1935343004-A	E6850Q41.3	5480	1/10/2020	12/31/2019	
24	1935343005	18CpTMW08DW_121319				SAMPLE	3	1935343005-A	E6850Q41.3	5480	1/10/2020	12/31/2019	
25	1935343006	18CpTMW08SW_121319				SAMPLE	3	1935343006-A	E6850Q41.3	5480	1/10/2020	12/31/2019	
26	689415	CCV for HBN 254116 [ELMS/2330]				CCV	3		E685041C3Q	5311		12/27/2019	



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Analytical Documentation

Analyst Write-upALS Work Order #'s & Sample #(')s: 1934851 (001-07); 1935316 (001-04); 1935343 (001-06)ELMS Batch/HBN ID: 2330 (254116)Prep Date: 12/19/2019 Analysis Date: 12/20/2019 Analyst: Tom BoschAnalyte: **Perchlorate** Matrix: **Water** Method: **6850**Sequence: \\HPCHEM\1\SEQUENCE\CLO4\2019\DEC\20DEC19D.sReported DL: **1.0µg/L** Reported LOD: **2.0µg/L** Reported LOQ: **4.0µg/L**SAMPLE PREPARATION/ANALYSIS:

Water: Samples were prepared by Tom Bosch. 10.0mL of each sample was pipetted into a 15-mL centrifuge tube, and 50µL of an oxygen-18 labeled perchlorate solution was added as an internal standard. The samples were capped, vortexed, and filtered with Phenex PES membrane 0.45µm Syringe filters prior to analysis.

REAGENTS: Eluent A1: 95% ASTM Type II water (ALS)/5%ACN (B&J Lot DU461-US)/0.1% glacial acetic acid (JT-Baker Lot 122550).
Eluent B1: 95% ACN (B&J Lot DU461-US)/5% ASTM Type II water (ALS)/0.1% glacial acetic acid (JT-Baker Lot 122550).

STANDARDS: Internal Standard Spiking Solution Horizon# 47863. Dilutions of Working Standards (Horizon: 49947/48) used for ICAL, CCV's, RLVS and ICS.

CALIBRATION CURVE: Used curve from 09/20/2019, sequence 20SEP19D.s Offline Quantitation Method: CLO4-DP3.M

INSTRUMENT CONDITIONS: Samples were analyzed with an Agilent 1100 LC/MSD system, in negative SIM mode, monitoring m/z 83, 85, and 89.

Instrument ID: LCMS04 Online Acquisition Method: CLO4-AQN.M Fragmentor: 160 Output Gain: 8 Injection Volume: 35µL
Column: KP-RPPX C8 separator, 250mm Mobile Phase: 70% Eluent A1; 30% Eluent B1 Run time: 12.0min.

FLOW GRADIENT:

Time (min.)	Flow (mL/min)
0	0.65
5.8	0.65
5.9	0.25
10.3	0.25
10.5	0.65
12.0	0.65

QC DATA: 3.0µL of QC Solution Horizon ID 47516 was used for LCS 689408; Target = 3.0µg/L. ASTM type II water was used for LMB 689411.

MS/MSD: The Matrix Spike and duplicate (MS/MSD) was performed on sample 1934851001 (Client ID's: MW19_120919). 3.0µl of Working Standard Solution Horizon ID 49947 was added to 10.0mL of sample preparation. Spike target = 3.0µg/L.

COMMENTS:

- 1) Results reported in µg/L. Field sample 1934851007 was analyzed and reported from a 1:100 dilution. Field sample 1935343005 was analyzed and reported from a 1:10 dilution. Field samples 1935343004/06 were analyzed and reported from 1:1,000 dilutions. The reporting limits have been adjusted accordingly.
- 2) All QC, Blank, CCV, and MS/MSD results were within method parameters.
- 3) Sample data can be viewed at two directories within the ALS system: \\ALSLTWS013\LCMS\LCMS04\2019\DEC\HBN# or through NuGenesis\Tree\PrintData\LCMS\DefaultView.
- 4) Notebook: \\alsltws013\ORGANIC\BOSCH\LCMS\Perchlorates\Waters\2019\254116-DoD-ALS-Hstn LCMS4 or through \\ALSLTWS013\DATA\REVIEW\HBN#
- 5) The Reporting Limit Verification Standard (RLVS – 689409) is reported from the analysis of the Laboratory Control Sample (LCS – 689408) at a level of 3.0µg/L.
- 6) Due to limitations of the Chemstation Software, some of the chromatographic peaks require manual integration. Manual Integrations were performed for one of the Initial Calibration analyses (datafile: 20SEPI03) along with datafile 20DEC19D14/16/18/19.

5.5 Chromatography (GC, HPLC and LC/MS) Technical Review

Note: It is the peer reviewer's responsibility to ensure that appropriate criteria are used as defined in the HORIZON PROFILE. The evaluation criteria are prioritized as per Section 2.2 of this SOP. These items must be checked for all projects. The following checklist will be completed by both the analyst and the peer reviewer and scanned into the HBN folder with the raw data.

Chromatography (GC, HPLC, LC/MS) Technical Review Criteria	Analyst Initials	Reviewer Initials
Batch(es)/SDG: <u>ELMS: 2330 HBN: 254116</u>		
Sample Set IDs if Applicable: <u>1934851 / 1935316 / 1935343</u>		
<u>Sample positions on autosampler verified against instrument sequence</u>	TB	NA
Calibration standards analyzed and meets criteria	TB	SB
Standards traceability checked and meets criteria	TB	SB
Standard curve coefficients evaluated and meet criteria	TB	SB
ICVs analyzed and meet acceptance criteria	TB	SB
CCVs analyzed and meet acceptance criteria	TB	SB
Retention Time Windows checked	TB	SB
For method 8081A, Endrin/DDT Breakdown is checked for compliance	—	—
Surrogate recoveries checked and appropriately addressed	—	—
Method Preparation Blanks analyzed and meet acceptance criteria	TB	SB
MSs, MSDs, and/or MDs analyzed and calculations checked; applicable	TB	SB
RLVS analyzed	TB	SB
Preparation and analysis hold times met	TB	SB
Preparation deviations and re-preparations noted when performed	TB	SB
Analysis deviations and re-analyses noted when performed	TB	SB
Sample dilution factors noted on reports	TB	SB
Electronic records in HBN transcription accuracy and completeness	TB	SB
Preparation and analysis calculations checked	TB	SB
NCRs are completed as necessary NC/CAR# _____	TB	SB
Report forms are complete and accurate	TB	SB
Manual integrations checked	TB	SB



STANDARD REPORT

Working Standard - CLO4ISTDWRK

CLO4ISTDWRK		Description - Perchlorate ISTD Wrk 1,000ug/L			
Standard: 49946		Created By: Thomas Bosch		Amount: 25 mL	
MFG: ALS/SLC		Create Date: 09/23/2019 03:09PM		Expires: 09/19/2020	
MFG Lot: TNB: 09/20/2019		Verified By: Thomas Bosch		Usable: Yes	
Pipette ID: Not Provided		Verify Date:		Lab Lot: CLO4ISTDWRK	
Pos.	Analyte	Name	Concentration		
1	14797-73-0-8385	Perchlorate 83:85 Ratio	1000 ug/L		
2	14797-73-0-89	Perchlorate 89	1000 ug/L		
Composition					
Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
47863	CLO4ISTDSTK	Perchlorate ISTD Stock	CLO4ISTDSTK	0.25 mL	12/05/2028



STANDARD REPORT

Constituent

Stock Standard - CLO4ISTDSTK

CLO4ISTDSTK		Description - Perchlorate ISTD Stock	
Standard: 47863		Created By: Thomas Bosch	Amount: 1 mL
MFG: Cambridge Isotope		Create Date: 05/23/2019 10:05AM	Expires: 12/05/2028
MFG Lot: SDIH-016		Verified By: Thomas Bosch	Usable: Yes
Part ID: OLM-7310-S		Verify Date:	Lab Lot: CLO4ISTDSTK
Pos.	Analyte	Name	Concentration
1	14797-73-0-8385	Perchlorate 83:85 Ratio	100 ug/mL
2	14797-73-0-89	Perchlorate 89	100 ug/mL



STANDARD REPORT

Working Standard - CLO4 WRK

CLO4 WRK		Description - 6850 WKG Std 100.ug/L			
Standard: 49948		Created By: Thomas Bosch		Amount: 10 mL	
MFG: ALS/SLC		Create Date: 09/20/2019 03:09PM		Expires: 07/25/2020	
MFG Lot: TNB: 09/20/2019				Usable: Yes	
Pipette ID: Not Provided				Lab Lot: CLO4 WRK	
Pos.	Analyte	Name	Concentration		
1	14797-73-0	Perchlorate	0.1 ug/mL		
2	14797-73-0-8385	Perchlorate 83:85 Ratio	0.1 ug/mL		
Composition					
Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
49947	CLO4 INT	6850 Intermdt AccStd 10.ug/mL	CLO4 INT	0.1 mL	07/25/2020



STANDARD REPORT

Constituent

Stock Standard - CLO4 STOCK

CLO4 STOCK		Description - 6850 Stock AccStd 1,000ug/mL	
Standard: 43659		Created By: Thomas Bosch	Amount: 100 mL
MFG: AccuStandard		Create Date: 09/17/2018 09:09AM	Expires: 07/25/2020
MFG Lot: 218065075			Usable: Yes
Part ID: IC-PER-10X-1			Lab Lot: CLO4 STOCK
Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	1000 ug/mL
2	14797-73-0-8385	Perchlorate 83:85 Ratio	1000 ug/mL



STANDARD REPORT

Constituent

Solvent Standard - ASTM H2O

ASTM H2O		Description - ASTM Type II Water	
Standard: 109	Created By: ALS Support (Lims)	Amount: 1000 L	
MFG: DCL In House	Create Date: 10/06/2005 09:10AM	Expires: 11/07/2025	
MFG Lot: Not Provided		Usable: Yes	
Part ID: Not Provided		Lab Lot: LAB 109	
Pos.	Analyte	Name	Concentration
Solvent - Analyte(s) not applicable			



STANDARD REPORT

Constituent

Working Standard - CLO4 INT

CLO4 INT		Description - 6850 Intermdt AccStd 10.ug/mL			
Standard: 49947		Created By: Thomas Bosch		Amount: 10 mL	
MFG: ALS/SLC		Create Date: 09/23/2019 03:09PM		Expires: 07/25/2020	
MFG Lot: TNB: 09/20/2019				Usable: Yes	
Pipette ID: Not Provided				Lab Lot: CLO4 INT	
Pos.	Analyte	Name	Concentration		
1	14797-73-0	Perchlorate	10 ug/mL		
2	14797-73-0-8385	Perchlorate 83:85 Ratio	10 ug/mL		
Composition					
Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
43659	CLO4 STOCK	6850 Stock AccStd 1,000ug/mL	CLO4 STOCK	0.1 mL	07/25/2020



STANDARD REPORT

Working Standard - CLO4 QC WRK

CLO4 QC WRK		Description - 6850 QC WKG STD 100ug/L			
Standard: 47516		Created By: Thomas Bosch		Amount: 10 mL	
MFG: ALS/SLC		Create Date: 05/06/2019 03:05PM		Expires: 03/31/2020	
MFG Lot: TNB: 05/06/2019				Usable: Yes	
Pipette ID: Not Provided		Lab Lot: CLO4 QC WRK 100.ug/L			
Pos.	Analyte	Name	Concentration		
1	14797-73-0	Perchlorate	100 ug/L		
Composition					
Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
47515	CLO4 QC INT	6850 QC Intrmdt Std-QC 10ug/mL	CLO4 QC INT 10.ug/mL	0.1 mL	03/31/2020



STANDARD REPORT

Constituent

Solvent Standard - ASTM H2O

ASTM H2O		Description - ASTM Type II Water	
Standard: 109	Created By: ALS Support (Lims)	Amount: 1000 L	
MFG: DCL In House	Create Date: 10/06/2005 09:10AM	Expires: 11/07/2025	
MFG Lot: Not Provided		Usable: Yes	
Part ID: Not Provided		Lab Lot: LAB 109	
Pos.	Analyte	Name	Concentration
Solvent - Analyte(s) not applicable			



STANDARD REPORT

Constituent

Stock Standard - CLO4 QCSTOCK

CLO4 QCSTOCK		Description - 6850 QC Stock STD 1,000ug/mL	
Standard: 36748	Created By: Thomas Bosch	Amount: 100 mL	
MFG: Ultra Scientific	Create Date: 05/11/2017 01:05PM	Expires: 03/31/2020	
MFG Lot: CP-0860		Usable: Yes	
Part ID: ICC-013		Lab Lot: CLO4 QC STOCK	
Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	1000 ug/mL



STANDARD REPORT

Constituent

Working Standard - CLO4 QC INT

CLO4 QC INT		Description - 6850 QC Intrmdt Std-QC 10ug/mL			
Standard: 47515		Created By: Thomas Bosch		Amount: 10 mL	
MFG: ALS/SLC		Create Date: 05/06/2019 03:05PM		Expires: 03/31/2020	
MFG Lot: TNB: 05/06/2019				Usable: Yes	
Pipette ID: Not Provided				Lab Lot: CLO4 QC INT 10.ug/mL	
Pos.	Analyte	Name	Concentration		
1	14797-73-0	Perchlorate	10 ug/mL		
Composition					
Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
36748	CLO4 QCSTOCK	6850 QC Stock STD 1,000ug/mL	CLO4 QC STOCK	0.1 mL	03/31/2020

125 Market Street
New Haven, CT 06513
USA



AccuStandard®

Tel (203)786-5290
Fax (203)786-5287
www.AccuStandard.com

CERTIFICATE OF ANALYSIS



43659

AccuTrace™ Reference Standard

Catalog No: IC-PER-10X-1
Description: Perchlorate Standard
Element: Perchlorate (ClO₄)
SRM: Ind. Std.
Lot: 218065075
Matrix: Water
Hazards: Refer to SDS for complete safety information

Date Certified: Jun 25, 2018
Expiration: Jul 25, 2020
Sample Size: 100 mL
Components: 1
Storage Condition: Ambient (>5 °C)
Included on ISO/IEC 17025 Scope of Accreditation: Yes
Included on ISO 17034 Scope of Accreditation: Yes



Signal Word: None

Component	SRM #	Prepared Concentration (µg/mL)
ClO ₄ Perchlorate	Ind. Std.	1000

The gravimetric uncertainty for this product is $\pm 0.24\%$.

The final solution was checked against an independent standard to verify its concentration.

We use the highest purity raw materials available to minimize impurity levels in the final solution. Typically 99.999%+ pure starting materials are used as well as ASTM Type I 18 megohm deionized water.

All solutions are filtered through a 0.2 µm filter prior to being bottled.

All glassware used in preparation is Class A and calibrated regularly.

All weights are traceable through NIST; Test No. 822-275872-11

All bottles are triple rinsed with deionized water prior to use.

Shake bottle prior to use and do not pipette directly out of the bottle. Use only cleaned Class A volumetric glassware.

We certify the accuracy of this standard to be $\pm 0.5\%$ of the stated value until its expiration date provided it is kept tightly capped and stored under the conditions stated above.

Certified By:

Meigan O'Leary

Meigan O'Leary, Inorganic QC Manager



Certificate of Analysis



ISO Guide 34 Reference Material

Product Number: ICC-013
Lot Number: CP-0860



Lot Issue Date: 29-Feb 2016
Expiration Date: 31-Mar 2020

Product Name: Perchlorate IC Standard

Description:

This Reference Material (RM) was gravimetrically prepared in accordance with ISO Guide 34 and under ULTRA Scientific's ISO 9001 registered quality system. The neat materials used for this product have been verified by ULTRA's ISO 17025 laboratory and under ULTRA's ISO Guide 34 accreditation. The analyte concentrations were verified by ULTRA's ISO 17025 accredited laboratory. For each analyte, the true value, with its uncertainty value calculated at the 95% confidence level, is reported below.

Analyte	Starting Material	Lot Number	Purity (%)	Calculated Value	True Value	Traceability & Method
perchlorate	potassium perchlorate	RM07987	100	1001 ± 5 µg/mL	976 ± 6 µg/mL	NIST SRM 3141A; ICP-OES

Solvent: water (low TOC, < 50 ppb)

Storage: Store at Room Temperature (15° to 30°C).

Traceability:

Traceability has been established through an unbroken chain of comparisons, each having stated uncertainties. Comparisons are based on appropriate physical or chemical measurements, including gravimetric or volumetric dilution, where the mass or volume of a solution before and after dilution is measured. The balances used for these measurements are calibrated with weights traceable to NIST in compliance with ANSI/NCCL Z-540-1, ISO 9001, ISO 17025, and ISO Guide 34. Calibrated Class A glassware is used for volumetric measurements. Thermometers are calibrated against a NIST traceable thermometer in accordance with NIST Special Publication 819.

Estimation of Uncertainties:

The true value is reported, with its uncertainty value calculated at the 95% confidence level.

Homogeneity:

This RM was formulated and unitized according to an in-house procedure and is guaranteed to be homogeneous. There is no minimum sub-sample size required.

Intended Use:

This RM is intended for the preparation of working reference samples for use in routine laboratory analyses, calibration of instruments, validation of analytical methods, assessments of measurement methods and continuing calibration verification.

Instructions for Use:

Sample aliquots for analysis should be withdrawn at 20°C to 25°C immediately after opening and should be processed without delay for the true value to be valid within the stated uncertainties. Do not pipet from the bottle. Do not return any material removed for pipetting to the bottle. Tightly cap the bottle after removing any material and store according to the instructions noted above.

Hazards:

Refer to the Safety Data Sheet for information regarding this RM.

Expiration of Certification:

The certification of this RM is valid, within the measurement uncertainty specified, until the expiration date specified above, provided the RM is handled and stored in accordance with the instructions given in this certificate. This certification is nullified if the RM is damaged, contaminated, or otherwise modified.



ISO 9001 Registered Quality System – TUV USA

Page 1 of 2



Certificate of Analysis



ISO Guide 34 Reference Material

Product Number: ICC-013

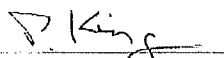
Lot Issue Date: 29-Feb 2016


Lot Number: CP-0860

Expiration Date: 31-Mar 2020

Maintenance of Certification:

The real-time, long term stability of the RM may be monitored over the lifetime of the certification. If substantive changes occur that affect the certification before the expiration of this certificate, ULTRA Scientific will notify the purchaser.


Peter A. King, Ph.D.
VP, Technical Operations


Daniel J. Lamendola
Director of QA/RA



ISO 9001 Registered Quality System – TUV USA

Page 2 of 2



Product Name: PERCHLORIC ACID, SODIUM SALT
(Isotopic Label & Enrichment Specification) (18O4, 90%+) 100 UG/ML IN WATER

Lot Number: SDIH-016

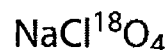
Catalog Number: OLM-7310-S

Product Information

Chemical Purity Specification: $\geq 98\%$

MW*: 130.44
* For isotopically labeled compounds, MW listed is for the fully enriched product.

Labeled CAS Number: NA



Unlabeled CAS Number: 7601-89-0

Chemical Formula: NaCl*O4

Storage: Store at room temperature away from light and moisture.

Stability: See storage and expiration date.

Certification

Cambridge Isotope Laboratories, Inc. guarantees that this material meets or exceeds the specifications stated. Absolute identity as well as chemical and isotopic purities are assured by the use of unambiguous synthetic routes and multiple chemical analyses whenever possible. Results are representative of QC testing at time of release from Quality Control unless otherwise stated. CIL Certificates of Analysis are occasionally updated with new data following recertification. We recommend checking the website for the latest version.

Volumetric measurements were made with Class A glassware. Gravimetry is traceable to the NIST through calibrated balances and certified, calibrated, standard weights. The calibrations are traceable to the NIST under Test No. 822/270236-04. The calibrations also meet specifications outlined in ISO 9001, ISO/IEC 17025, ANSI/NSCL Z540-1-1994, NCR Document 10CFR50 Appendix B, and applicable subdocuments.

This COA references the bulk catalog number before packaging. The COA also applies to the CIL finished good catalog number. Some possible packaging sizes and their corresponding suffix are -1.2, -1, -0.5, -10, or -0.1.

Approved by: Sashi Sivendran-Basak

Sashi Sivendran-Basak, Ph.D., Quality Review

Quality Control Tests and Results

QC Release Date	12/05/2018
Expiration Date	12/05/2028
Concentration Based on Gravimetry	100.0 \pm 1.0 $\mu\text{g/mL}$ (k=2)
Chemical Purity of Neat Material(s)	98%
LC/MS for Concentration	105.4 \pm 1.1 $\mu\text{g/mL}$ (k=2)



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Batch Review Method:

C:\HPCHEM\1\METHODS\CLO4-DP3.M

['#' ==> Run has not been reprocessed with Batch Review Method
 '*' ==> Run has been saved with batch file]

#*	Sample	Location	Inj	SampleType	Run	Perchlorate Area	Perchlorat RT	Perchlorate Amount		
*	689407	CCV@25	Vial 71	1	Control	1	2.04111e6	7.471	26.70894	
*	689408	QC@3.0	Vial 72	1	Control	2	2.12147e5	7.304	3.31347	
*	689410	ICS@3.0	Vial 73	1	Control	3	1.66491e5	7.340	3.40481	
*	689411	LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000	
*	1934851001		Vial 75	1	Sample	5	0.00000	0.000	0.00000	
*	689412	348511S	Vial 76	1	Sample	6	1.38253e5	7.037	2.83835	
*	689413	348511D	Vial 77	1	Sample	7	1.40128e5	7.058	2.81186	
*	1934851002		Vial 78	1	Sample	8	0.00000	0.000	0.00000	
*	1934851003		Vial 79	1	Sample	9	0.00000	0.000	0.00000	
*	1934851004		Vial 80	1	Sample	10	0.00000	0.000	0.00000	
*	1934851005		Vial 81	1	Sample	11	9.83459e4	7.243	1.78789	
*	1934851006		Vial 82	1	Sample	12	5.44257e6	7.287	72.53538	
*	1934851007	100	Vial 83	1	Sample	13	1.73953e6	7.475	2605.96119	
*	1935316001		Vial 84	1	Sample	14	3.52468e4	7.247	5.74894e-1	<RL
*	689414	CCV@25	Vial 71	1	Control	15	1.84036e6	7.451	26.75450	
*	1935316002		Vial 85	1	Sample	16	3.77116e4	7.221	6.01872e-1	
*	1935316003		Vial 86	1	Sample	17	0.00000	0.000	0.00000	
*	1935316004		Vial 87	1	Sample	18	7.95168e4	7.352	1.36838	
*	1935343001		Vial 88	1	Sample	19	4.74847e4	7.368	6.12339e-1	<RL
*	1935343002		Vial 89	1	Sample	20	2.21821e6	7.450	31.67406	
*	1935343003		Vial 90	1	Sample	21	2.24522e6	7.455	28.95321	
*	1935343004	1K	Vial 91	1	Sample	22	2.15597e6	7.560	3.16912e4	
*	1935343005	10X	Vial 92	1	Sample	23	2.14251e6	7.460	306.28091	
*	1935343006	1K	Vial 93	1	Sample	24	1.59545e6	7.560	2.44498e4	
*	689415	CCV@25	Vial 71	1	Control	26	1.93976e6	7.449	27.06627	

#*	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount	
*	689407	CCV@25	Vial 71	1	Control	1	2.59291e5	7.493	5.00000
*	689408	QC@3.0	Vial 72	1	Control	2	2.35842e5	7.331	5.00000
*	689410	ICS@3.0	Vial 73	1	Control	3	1.80164e5	7.367	5.00000
*	689411	LMB	Vial 74	1	Control	4	2.03065e5	7.582	5.00000
*	1934851001		Vial 75	1	Sample	5	1.95221e5	7.066	5.00000
*	689412	348511S	Vial 76	1	Sample	6	1.79080e5	7.059	5.00000
*	689413	348511D	Vial 77	1	Sample	7	1.83192e5	7.075	5.00000
*	1934851002		Vial 78	1	Sample	8	1.96897e5	7.325	5.00000
*	1934851003		Vial 79	1	Sample	9	2.13267e5	7.369	5.00000
*	1934851004		Vial 80	1	Sample	10	2.55178e5	7.427	5.00000
*	1934851005		Vial 81	1	Sample	11	1.99854e5	7.262	5.00000
*	1934851006		Vial 82	1	Sample	12	2.13698e5	7.303	5.00000
*	1934851007	100	Vial 83	1	Sample	13	2.27091e5	7.495	500.00000
*	1935316001		Vial 84	1	Sample	14	2.04618e5	7.262	5.00000
*	689414	CCV@25	Vial 71	1	Control	15	2.33347e5	7.471	5.00000
*	1935316002		Vial 85	1	Sample	16	2.10291e5	7.237	5.00000
*	1935316003		Vial 86	1	Sample	17	2.35612e5	7.318	5.00000
*	1935316004		Vial 87	1	Sample	18	2.08671e5	7.360	5.00000
*	1935343001		Vial 88	1	Sample	19	2.60797e5	7.401	5.00000
*	1935343002		Vial 89	1	Sample	20	2.32847e5	7.471	5.00000
*	1935343003		Vial 90	1	Sample	21	2.60703e5	7.474	5.00000
*	1935343004	1K	Vial 91	1	Sample	22	2.26176e5	7.573	5000.00000
*	1935343005	10X	Vial 92	1	Sample	23	2.33572e5	7.478	50.00000
*	1935343006	1K	Vial 93	1	Sample	24	2.23474e5	7.585	5000.00000
*	689415	CCV@25	Vial 71	1	Control	26	2.42807e5	7.466	5.00000

Batch Report: C:\HPCHEM\1\DATA\20DEC19D\20DEC19S.B

#*	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount	
*	689407	CCV@25	Vial 71	1	Control	1	5.93972e5	7.487	25.61044
*	689408	QC@3.0	Vial 72	1	Control	2	6.76074e4	7.319	3.37214
*	689410	ICS@3.0	Vial 73	1	Control	3	5.88058e4	7.363	3.85429
*	689411	LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
*	1934851001		Vial 75	1	Sample	5	0.00000	0.000	0.00000
*	689412	348511S	Vial 76	1	Sample	6	4.66372e4	7.052	3.05269
*	689413	348511D	Vial 77	1	Sample	7	4.60206e4	7.076	2.94032
*	1934851002		Vial 78	1	Sample	8	0.00000	0.000	0.00000
*	1934851003		Vial 79	1	Sample	9	0.00000	0.000	0.00000
*	1934851004		Vial 80	1	Sample	10	0.00000	0.000	0.00000
*	1934851005		Vial 81	1	Sample	11	3.27990e4	7.260	1.87240
*	1934851006		Vial 82	1	Sample	12	1.62653e6	7.303	72.09762
*	1934851007	100	Vial 83	1	Sample	13	5.14969e5	7.496	2537.47075
*	1935316001		Vial 84	1	Sample	14	1.31713e4	7.258	6.37095e-1
*	689414	CCV@25	Vial 71	1	Control	15	5.38679e5	7.465	25.79127
*	1935316002		Vial 85	1	Sample	16	1.63168e4	7.250	8.01605e-1
*	1935316003		Vial 86	1	Sample	17	0.00000	0.000	0.00000
*	1935316004		Vial 87	1	Sample	18	2.26779e4	7.376	1.18748
*	1935343001		Vial 88	1	Sample	19	1.63337e4	7.429	6.15421e-1
*	1935343002		Vial 89	1	Sample	20	6.46838e5	7.469	30.49596
*	1935343003		Vial 90	1	Sample	21	6.55399e5	7.466	27.86984
*	1935343004	1K	Vial 91	1	Sample	22	6.33070e5	7.573	3.07034e4
*	1935343005	10X	Vial 92	1	Sample	23	6.46073e5	7.474	303.78698
*	1935343006	1K	Vial 93	1	Sample	24	4.66349e5	7.577	2.35134e4
*	689415	CCV@25	Vial 71	1	Control	26	5.67687e5	7.463	26.09198

*** End of Report ***

Sequence Table:

Method and Injection Info Part:

Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
====	=====	=====	=====	===	=====	=====	=====
1	Vial 71	689407	CCV@25	CLO4-AQN	1	Ctrl Samp	
2	Vial 72	689408	QC@3.0	CLO4-AQN	1	Ctrl Samp	
3	Vial 73	689410	ICS@3.0	CLO4-AQN	1	Ctrl Samp	
4	Vial 74	689411	LMB	CLO4-AQN	1	Ctrl Samp	
5	Vial 75	1934851001		CLO4-AQN	1	Sample	
6	Vial 76	689412	348511S	CLO4-AQN	1	Sample	
7	Vial 77	689413	348511D	CLO4-AQN	1	Sample	
8	Vial 78	1934851002		CLO4-AQN	1	Sample	
9	Vial 79	1934851003		CLO4-AQN	1	Sample	
10	Vial 80	1934851004		CLO4-AQN	1	Sample	
11	Vial 81	1934851005		CLO4-AQN	1	Sample	
12	Vial 82	1934851006		CLO4-AQN	1	Sample	
13	Vial 83	1934851007	100	CLO4-AQN	1	Sample	
14	Vial 84	1935316001		CLO4-AQN	1	Sample	
15	Vial 71	689414	CCV@25	CLO4-AQN	1	Ctrl Samp	
16	Vial 85	1935316002		CLO4-AQN	1	Sample	
17	Vial 86	1935316003		CLO4-AQN	1	Sample	
18	Vial 87	1935316004		CLO4-AQN	1	Sample	
19	Vial 88	1935343001		CLO4-AQN	1	Sample	
20	Vial 89	1935343002		CLO4-AQN	1	Sample	
21	Vial 90	1935343003		CLO4-AQN	1	Sample	
22	Vial 91	1935343004	1K	CLO4-AQN	1	Sample	
23	Vial 92	1935343005	10X	CLO4-AQN	1	Sample	
24	Vial 93	1935343006	1K	CLO4-AQN	1	Sample	
25	Vial 94	1934851006	10X	CLO4-AQN	1	Sample	
26	Vial 71	689415	CCV@25	CLO4-AQN	1	Ctrl Samp	

Data file: C:\HPCHEM\1\DATA\20DEC19D\20DEC19D01.D

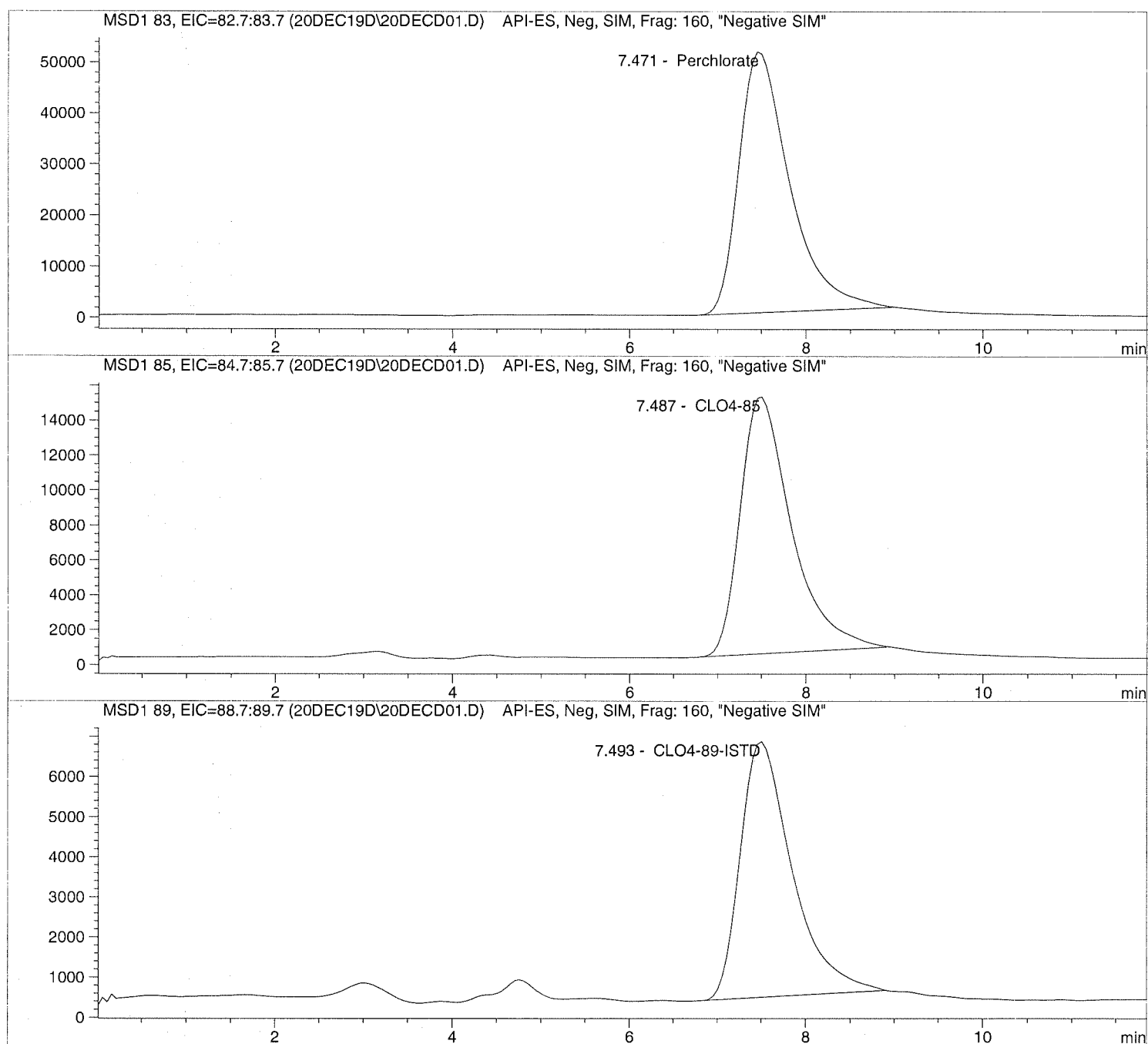
Sample Name: 689407 CCV@25

=====
Injection Date: 12/20/2019 13:20:20
Sample Name: 689407 CCV@25
Acq Operator: TNB

Seq Line: 1
Location: Vial 71
Inj. No.: 1
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20DEC19D\20DECD01.D Sample Name: 689407 CCV@25

```

=====
Injection Date: 12/20/2019 13:20:20      Seq Line: 1
Sample Name: 689407 CCV@25              Location: Vial 71
Acq Operator: TNB                       Inj. No.: 1
                                           Inj. Vol.: 35 µl
=====

```

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Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By: Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 25.000
=====

```

```

=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.471	PBA	2041110.1	26.7089	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.487	PBA	593972.4	25.6104	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.493	PBA	259291.4	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\20DEC19D\20DECD02.D

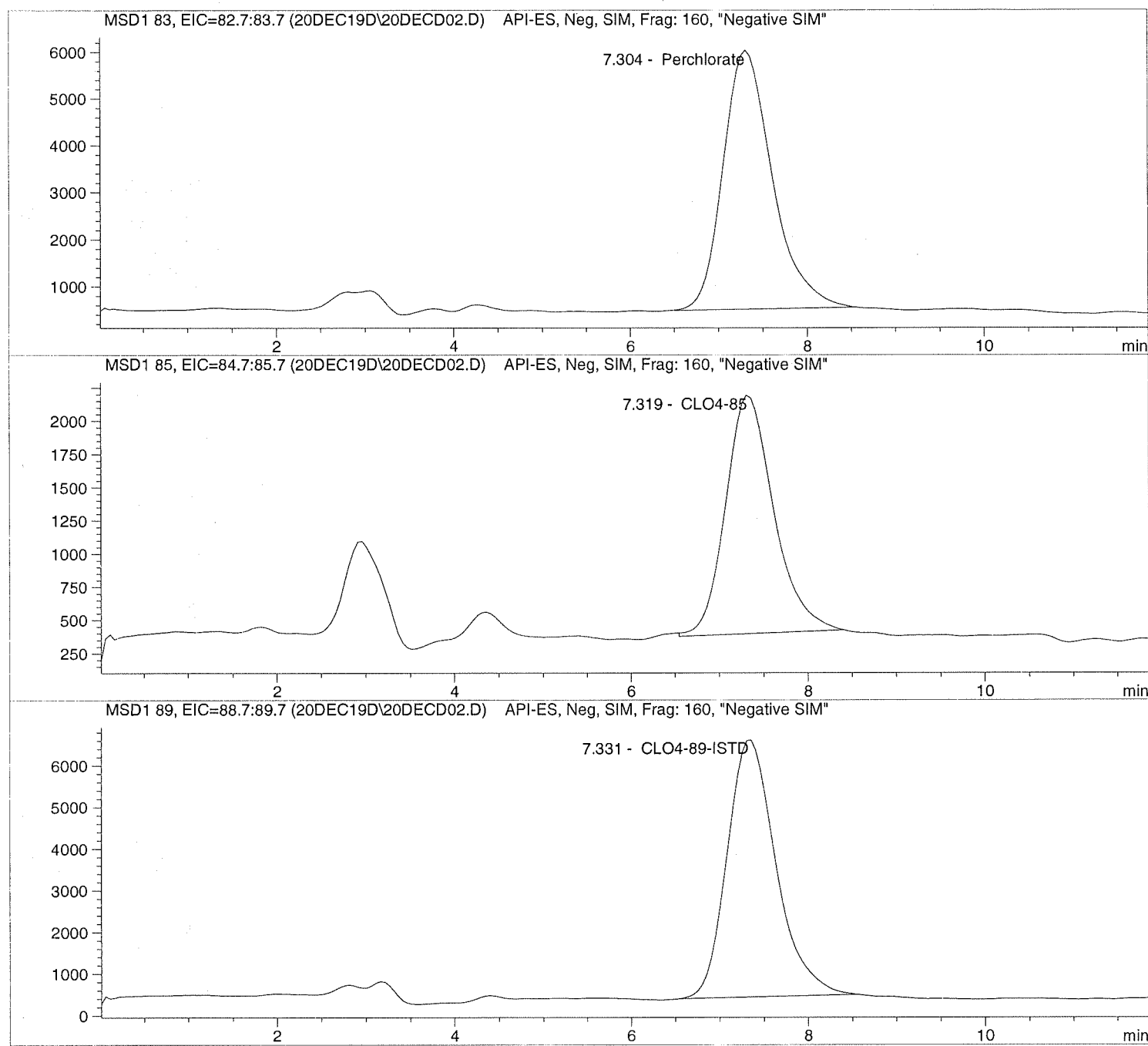
Sample Name: 689408 QC@3.0

Injection Date: 12/20/2019 13:34:12
Sample Name: 689408 QC@3.0
Acq Operator: TNB

Seq Line: 2
Location: Vial 72
Inj. No.: 1
Inj. Vol.: 35 μ l

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20DEC19D\20DECD02.D Sample Name: 689408 QC@3.0

```

=====
Injection Date: 12/20/2019 13:34:12      Seq Line: 2
Sample Name:    689408 QC@3.0           Location:  Vial 72
Acq Operator:   TNB                     Inj. No.: 1
                                           Inj. Vol.: 35 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   11/5/2019 08:44:45
=====

```

Perchlorate analysis

Sample Information

```

=====
Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:    1.000000
Dilution:      1.000000
Sample Amount: 3.000
=====

```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.304	BBA	212146.7	3.3135	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.319	BBA	67607.4	3.3721	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.331	PBA	235841.7	5.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\20DEC19D\20DEC19D03.D

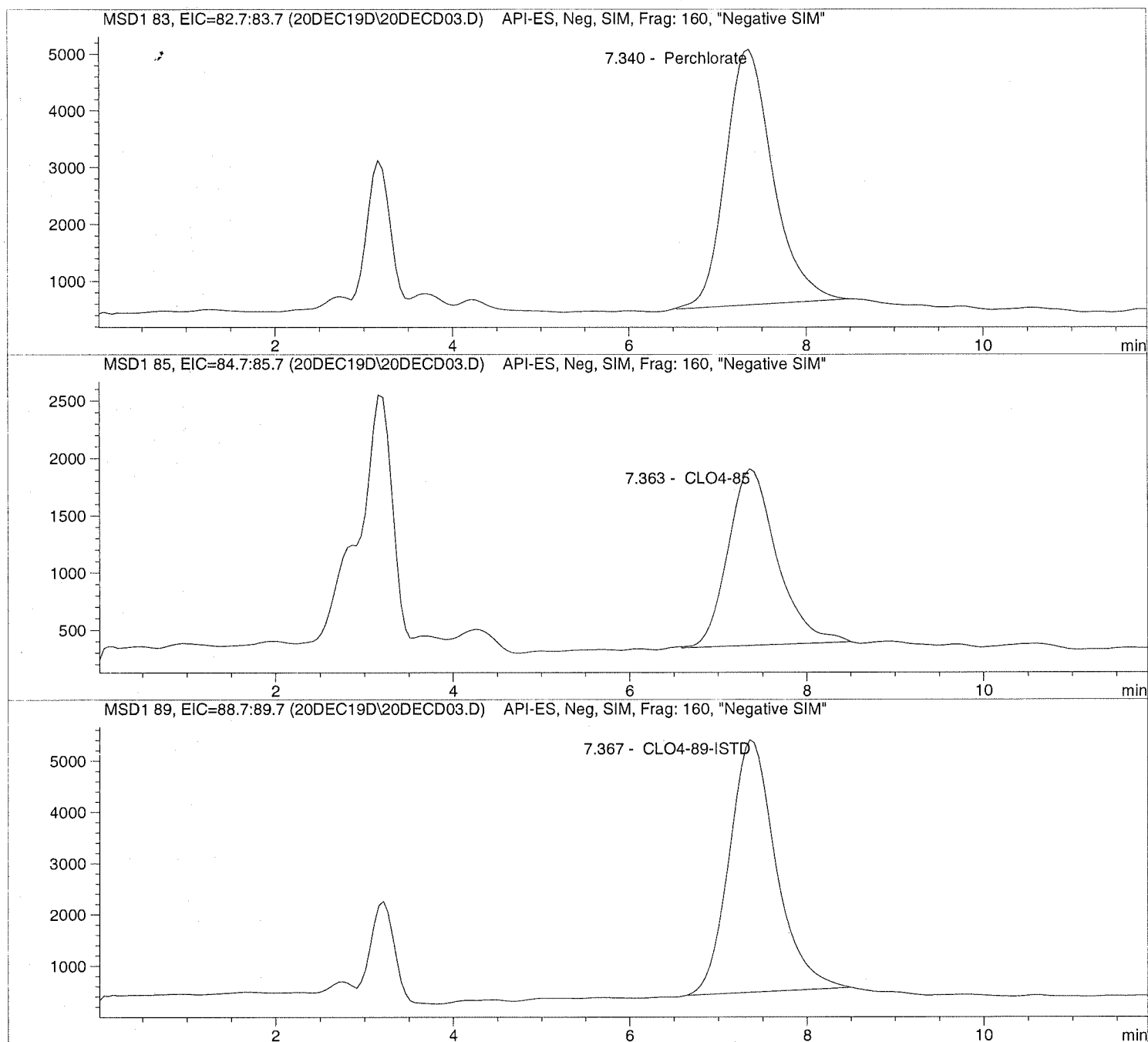
Sample Name: 689410 ICS@3.0

Injection Date: 12/20/2019 13:48:05
Sample Name: 689410 ICS@3.0
Acq Operator: TNB

Seq Line: 3
Location: Vial 73
Inj. No.: 1
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20DEC19D\20DECD03.D Sample Name: 689410 ICS@3.0

```

=====
Injection Date: 12/20/2019 13:48:05      Seq Line:          3
Sample Name:    689410 ICS@3.0           Location:          Vial 73
Acq Operator:   TNB                      Inj. No.:         1
                                           Inj. Vol.:        35 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   11/5/2019 08:44:45
=====

```

Perchlorate analysis

Sample Information

```

=====
Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  3.000
=====

```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.340	BBA	166491.5	3.4048	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.363	BBA	58805.8	3.8543	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.367	BBA	180164.4	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```


Data file: C:\HPCHEM\1\DATA\20DEC19D\20DECD04.D

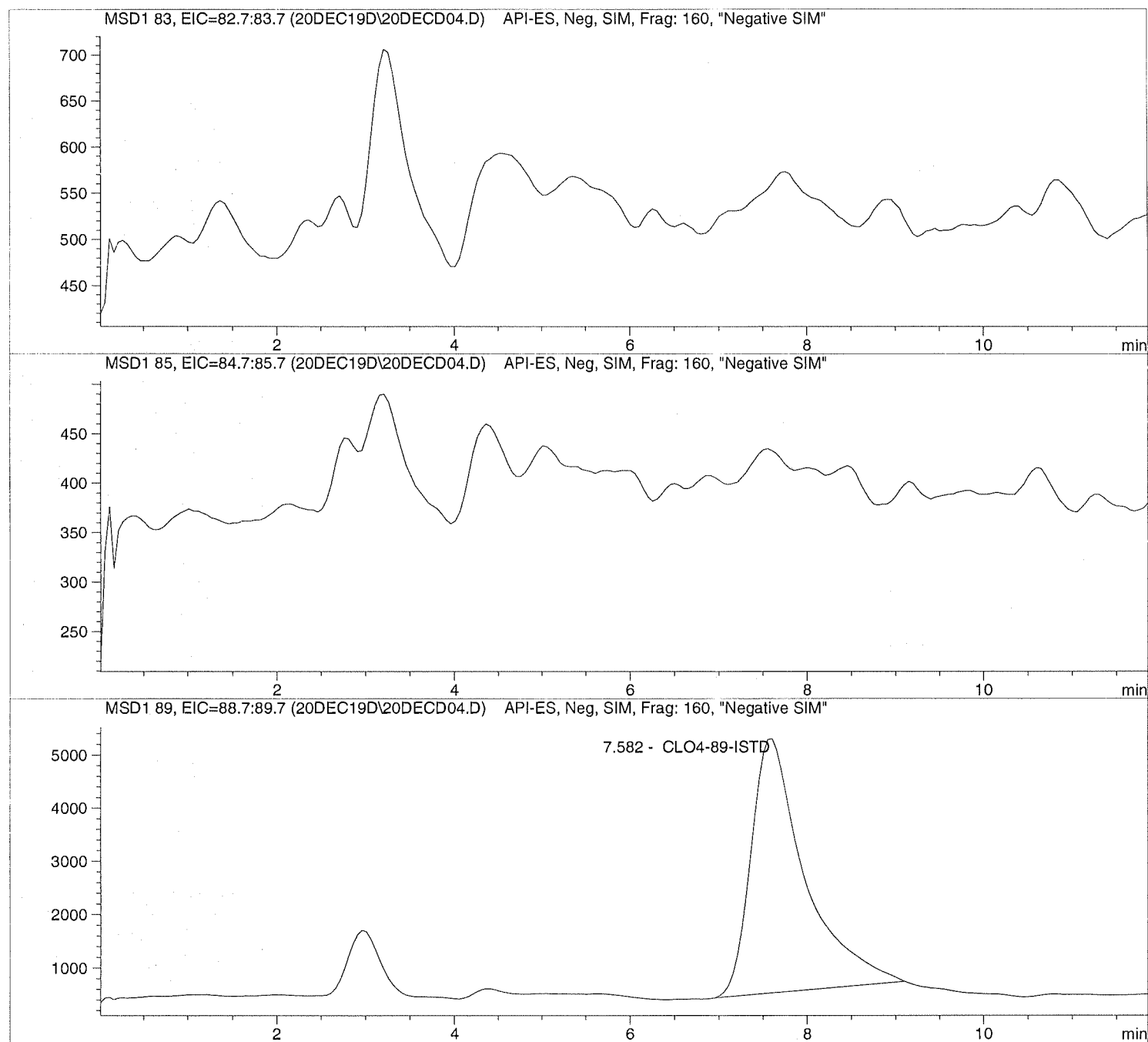
Sample Name: 689411 LMB

=====
Injection Date: 12/20/2019 14:02:00
Sample Name: 689411 LMB
Acq Operator: TNB

Seq Line: 4
Location: Vial 74
Inj. No.: 1
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20DEC19D\20DEC19D04.D Sample Name: 689411 LMB

```

=====
Injection Date: 12/20/2019 14:02:00      Seq Line: 4
Sample Name: 689411 LMB                  Location: Vial 74
Acq Operator: TNB                        Inj. No.: 1
                                           Inj. Vol.: 35 µl
=====

```

```

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By: Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 0.000
=====

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=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.582	PBA	203064.9	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

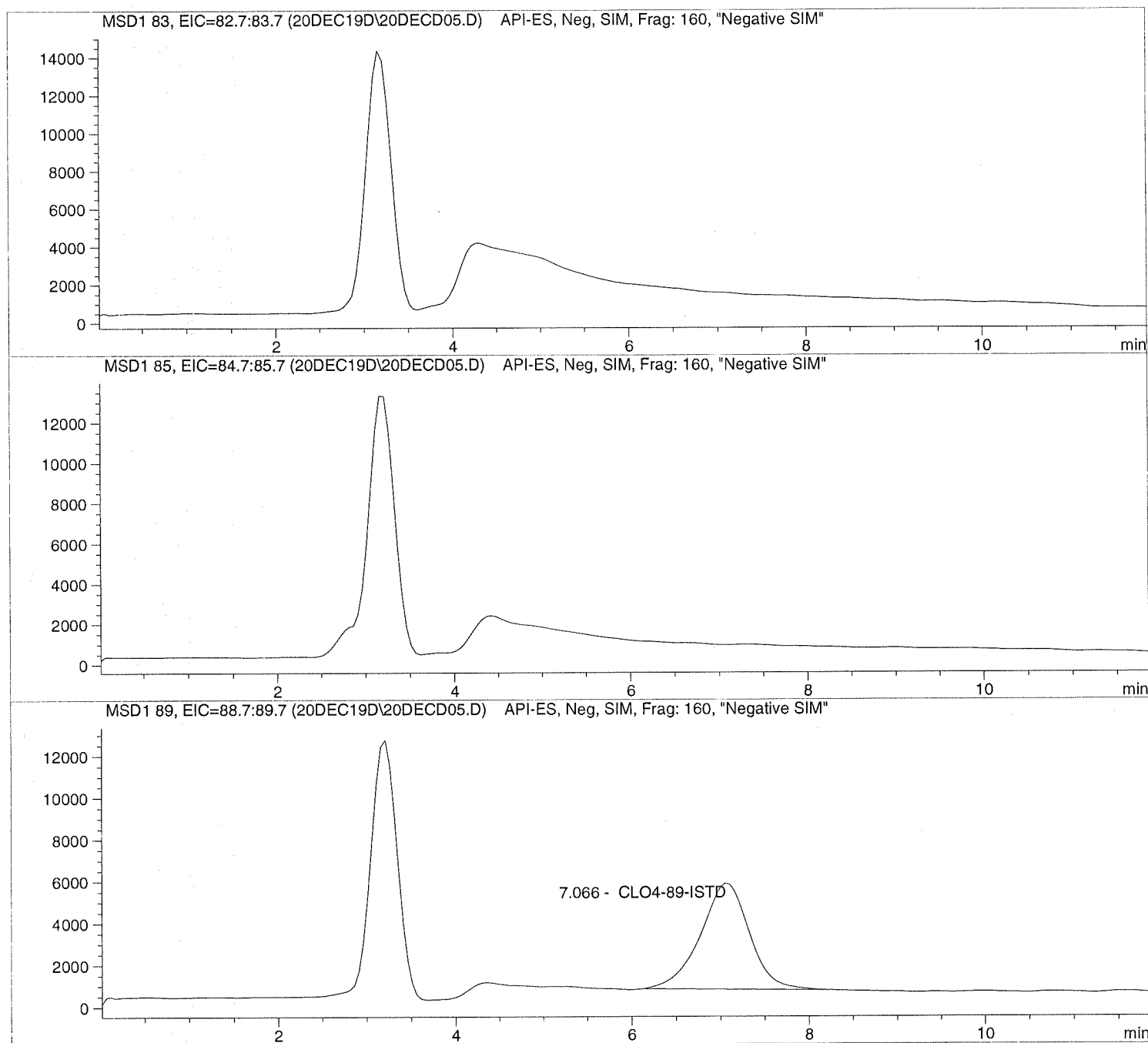
```

Data file: C:\HPCHEM\1\DATA\20DEC19D\20DEC19D05.D Sample Name: 1934851001

```
=====
Injection Date: 12/20/2019 14:15:58      Seq Line:      5
Sample Name:    1934851001                Location:      Vial 75
Acq Operator:   TNB                       Inj. No.:     1
                                           Inj. Vol.:    35 µl
=====
```

```
Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   11/5/2019 08:44:45
=====
```

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20DEC19D\20DEC05.D Sample Name: 1934851001

```

=====
Injection Date: 12/20/2019 14:15:58      Seq Line:          5
Sample Name:   1934851001                Location:         Vial 75
Acq Operator:  TNB                       Inj. No.:        1
                                           Inj. Vol.:       35 µl

```

```

Acq. Method:   CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:  11/5/2019 08:44:45

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:    1.000000
Dilution:      1.000000
Sample Amount: 0.000

```

```

=====
                          LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.066	PBA	195221.4	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***

```

Data file: C:\HPCHEM\1\DATA\20DEC19D\20DECD06.D

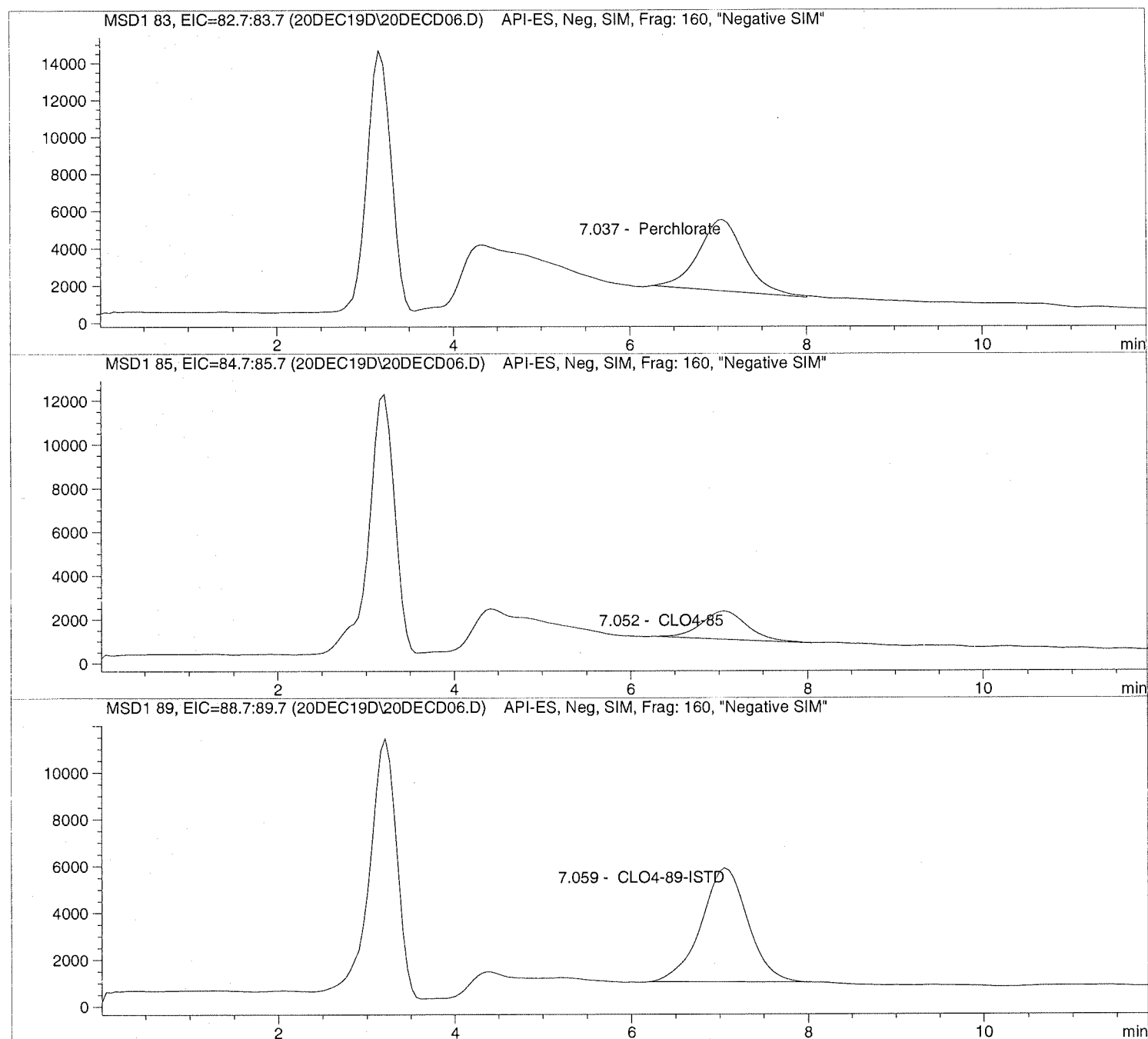
Sample Name: 689412 348511S

Injection Date: 12/20/2019 14:29:51
Sample Name: 689412 348511S
Acq Operator: TNB

Seq Line: 6
Location: Vial 76
Inj. No.: 1
Inj. Vol.: 35 μ l

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20DEC19D\20DECD06.D Sample Name: 689412 348511S

```

=====
Injection Date: 12/20/2019 14:29:51      Seq Line:          6
Sample Name:    689412 348511S           Location:          Vial 76
Acq Operator:   TNB                      Inj. No.:         1
                                           Inj. Vol.:        35 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  0.000
=====

```

```

=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.037	PBA	138252.7	2.8383	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.052	PBA	46637.2	3.0527	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.059	PBA	179079.6	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

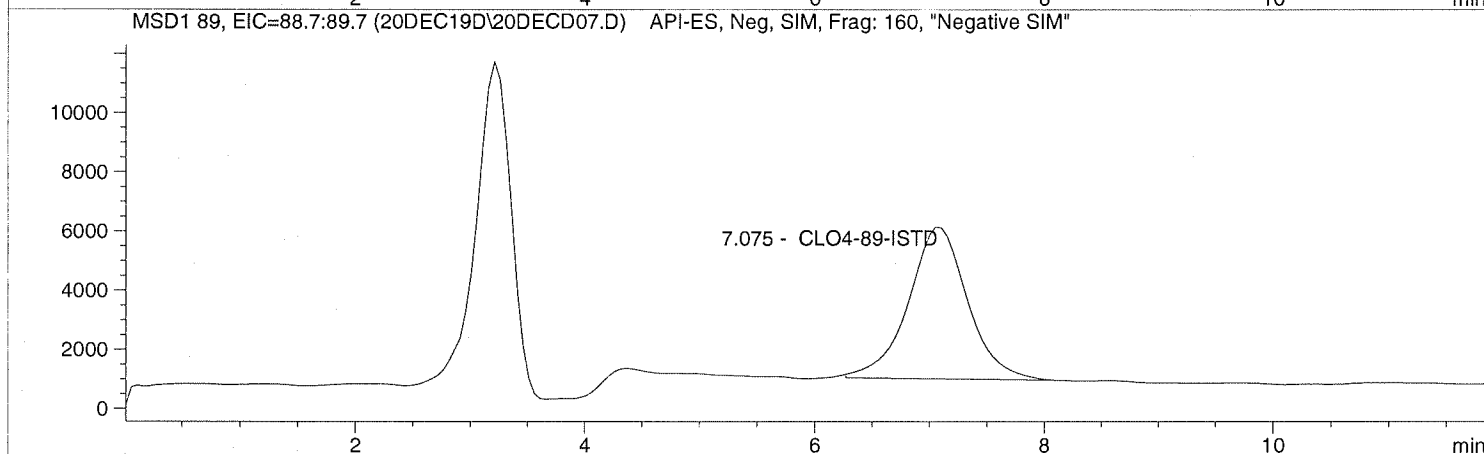
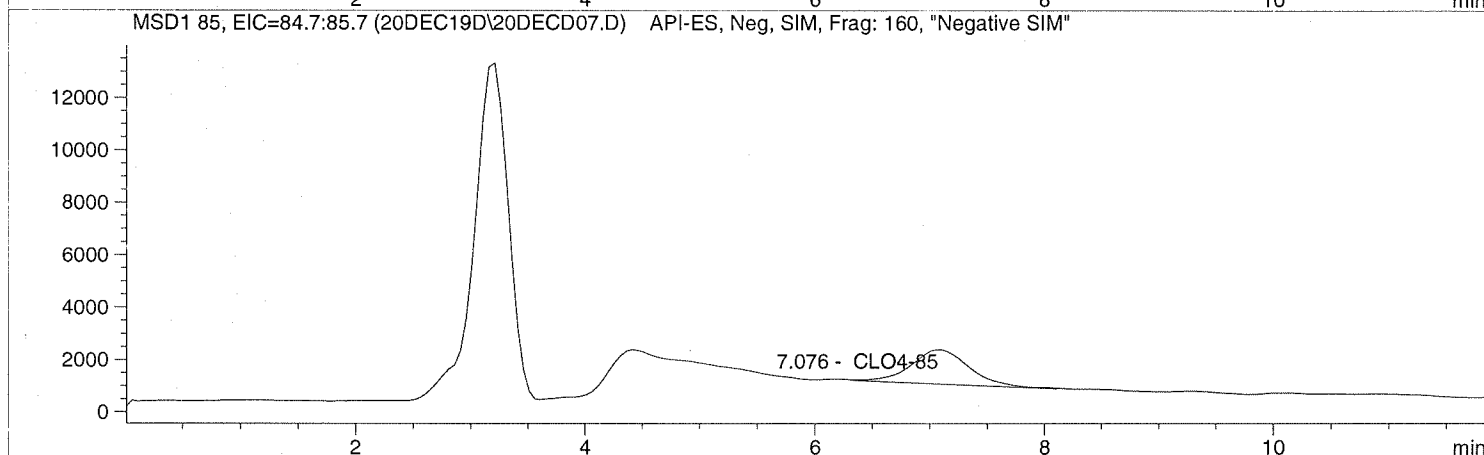
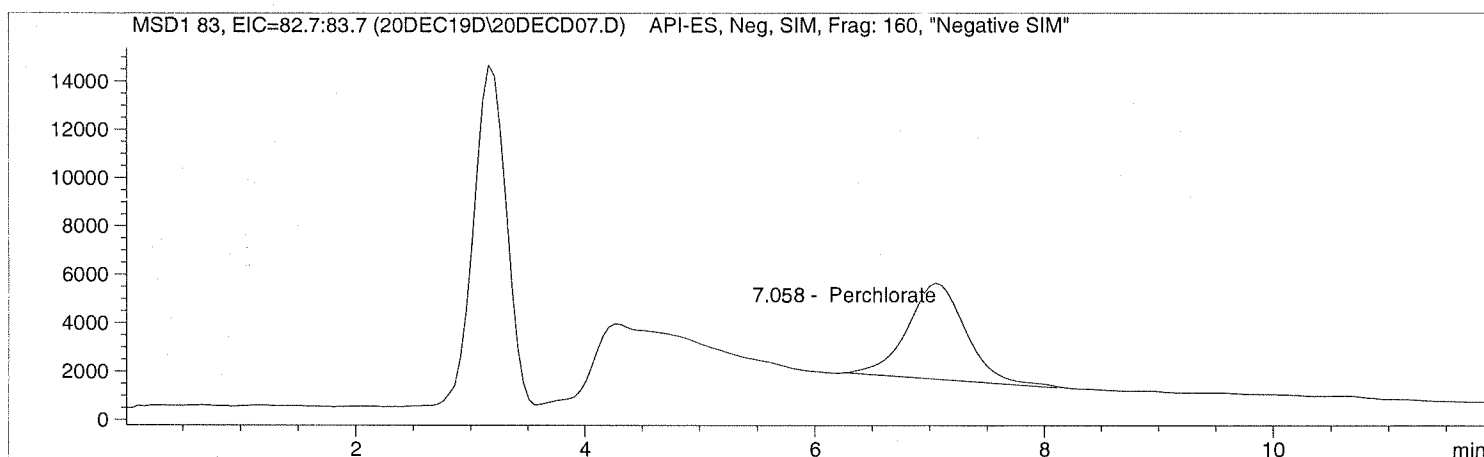
```

Data file: C:\HPCHEM\1\DATA\20DEC19D\20DECD07.D Sample Name: 689413 348511D

```
=====
Injection Date: 12/20/2019 14:43:48      Seq Line: 7
Sample Name:    689413 348511D          Location: Vial 77
Acq Operator:   TNB                     Inj. No.: 1
                                           Inj. Vol.: 35 µl
=====
```

```
Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   11/5/2019 08:44:45
```

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20DEC19D\20DEC19D07.D Sample Name: 689413 348511D

```

=====
Injection Date: 12/20/2019 14:43:48      Seq Line: 7
Sample Name: 689413 348511D             Location: Vial 77
Acq Operator: TNB                        Inj. No.: 1
                                           Inj. Vol.: 35 µl
=====

```

```

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By: Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 0.000
=====

```

```

=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.058	PBA	140128.3	2.8119	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.076	BBA	46020.6	2.9403	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.075	BBA	183191.7	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```


Data file: C:\HPCHEM\1\DATA\20DEC19D\20DEC19D08.D

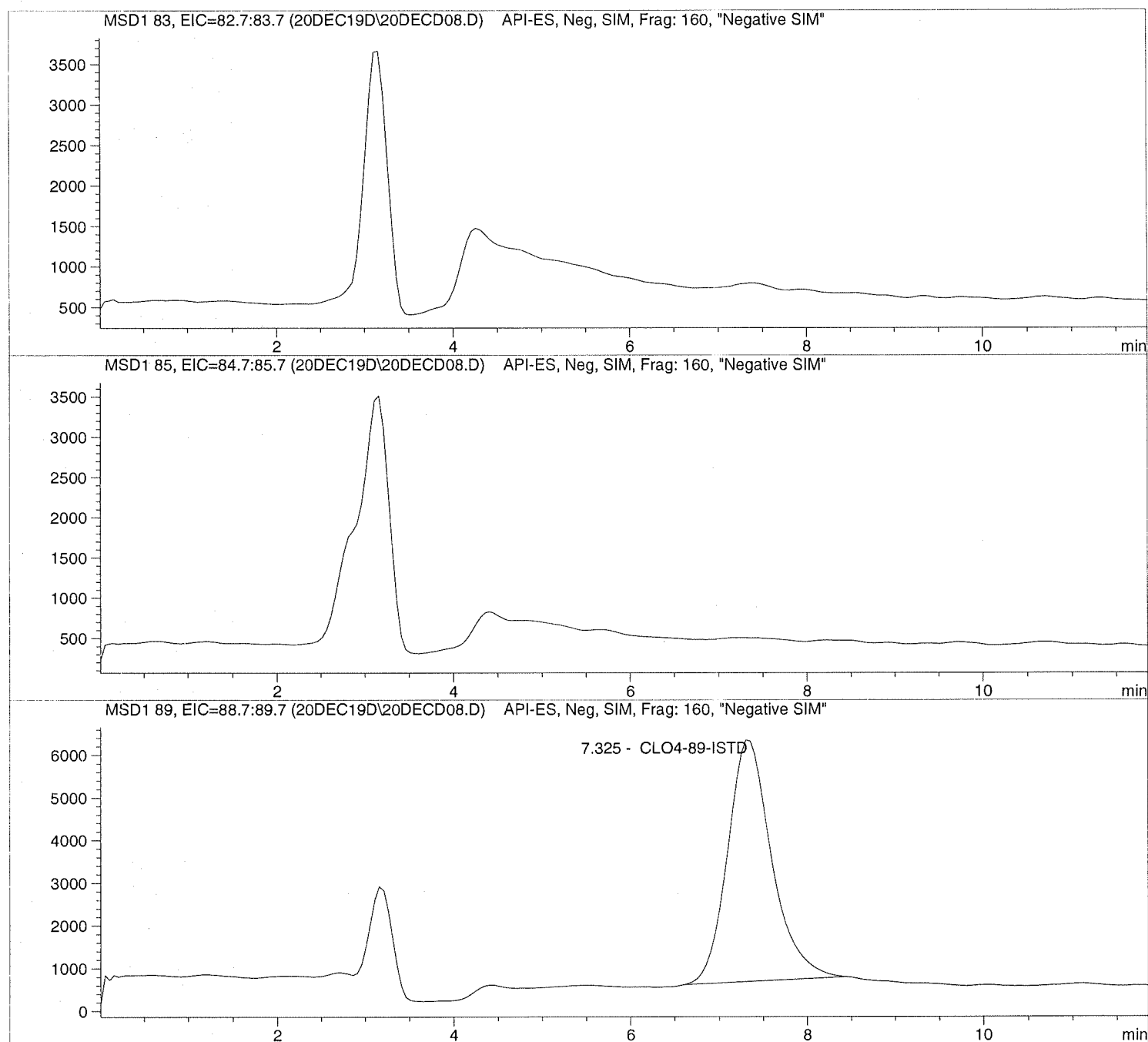
Sample Name: 1934851002

Injection Date: 12/20/2019 14:57:42
Sample Name: 1934851002
Acq Operator: TNB

Seq Line: 8
Location: Vial 78
Inj. No.: 1
Inj. Vol.: 35 μ l

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20DEC19D\20DEC19D.D

Sample Name: 1934851002

```

=====
Injection Date: 12/20/2019 14:57:42      Seq Line:      8
Sample Name:   1934851002                Location:      Vial 78
Acq Operator:  TNB                       Inj. No.:     1
                                           Inj. Vol.:    35 µl
=====

```

```

Acq. Method:   CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:  11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:    1.000000
Dilution:      1.000000
Sample Amount: 0.000
=====

```

```

=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.325	PBA	196897.1	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\20DEC19D\20DECD09.D

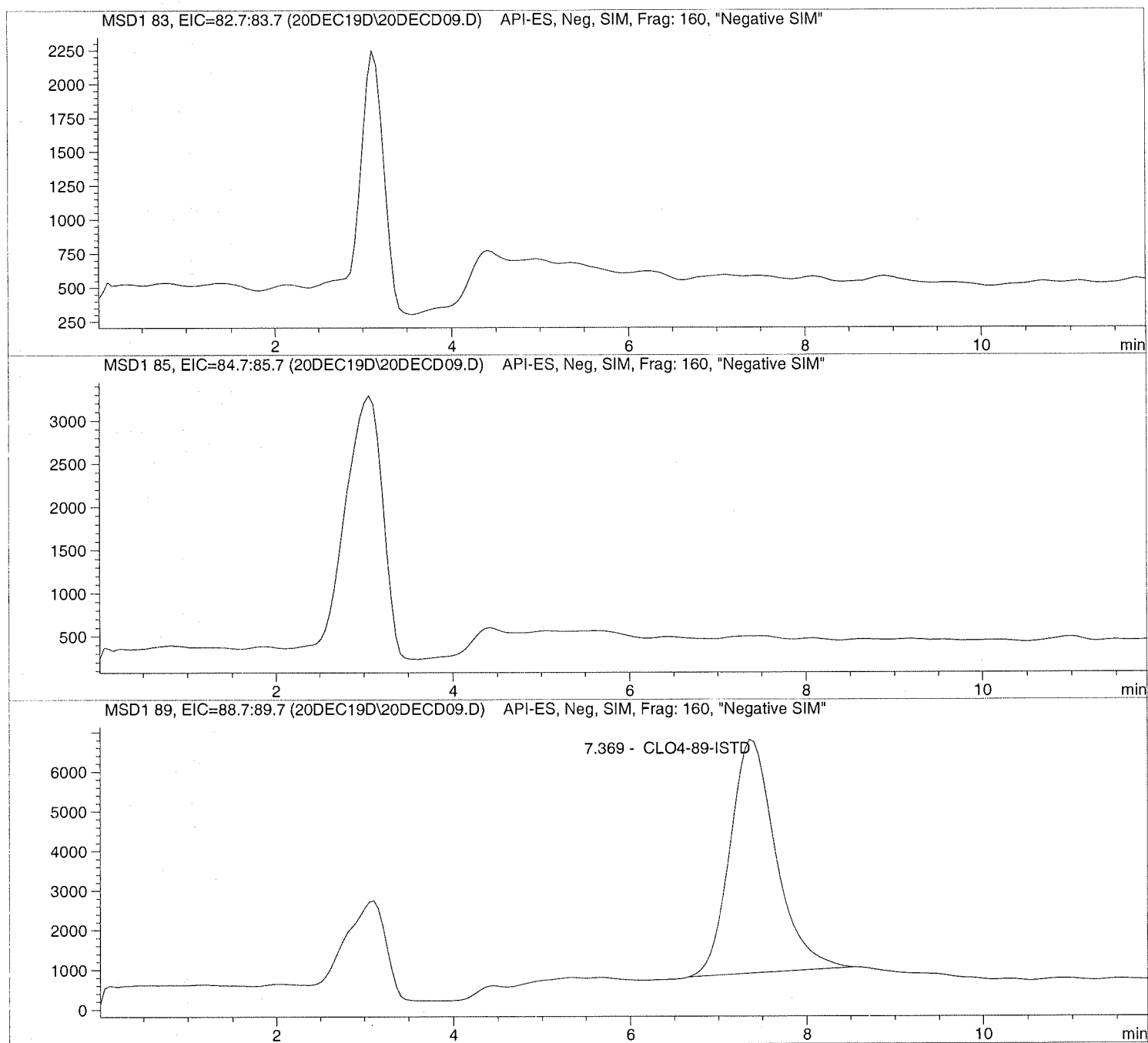
Sample Name: 1934851003

=====
Injection Date: 12/20/2019 15:11:34
Sample Name: 1934851003
Acq Operator: TNB

Seq Line: 9
Location: Vial 79
Inj. No.: 1
Inj. Vol.: 35 μ l

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20DEC19D\20DEC19D.D

Sample Name: 1934851003

```

=====
Injection Date: 12/20/2019 15:11:34      Seq Line:          9
Sample Name:    1934851003                Location:          Vial 79
Acq Operator:   TNB                       Inj. No.:         1
                                           Inj. Vol.:        35 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  0.000
=====

```

```

=====
                          LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.369	PBA	213267.4	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\20DEC19D\20DECD10.D

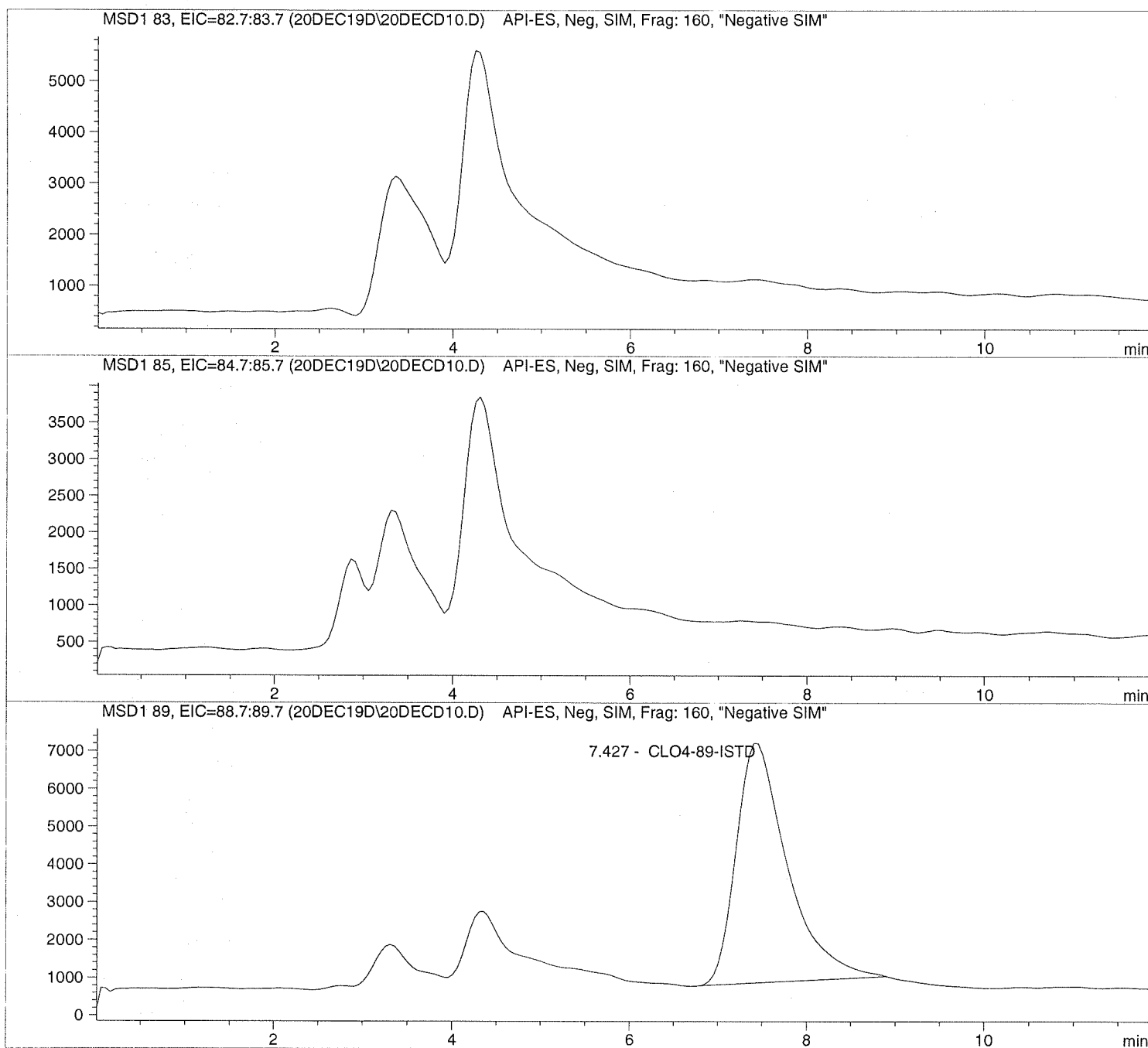
Sample Name: 1934851004

=====
Injection Date: 12/20/2019 15:25:34
Sample Name: 1934851004
Acq Operator: TNB

Seq Line: 10
Location: Vial 80
Inj. No.: 1
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20DEC19D\20DECD10.D Sample Name: 1934851004

```

=====
Injection Date: 12/20/2019 15:25:34      Seq Line: 10
Sample Name: 1934851004                  Location: Vial 80
Acq Operator: TNB                         Inj. No.: 1
                                           Inj. Vol.: 35 µl
=====

```

```

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By: Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 0.000
=====

```

```

=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.427	PBA	255177.9	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\20DEC19D\20DECD11.D

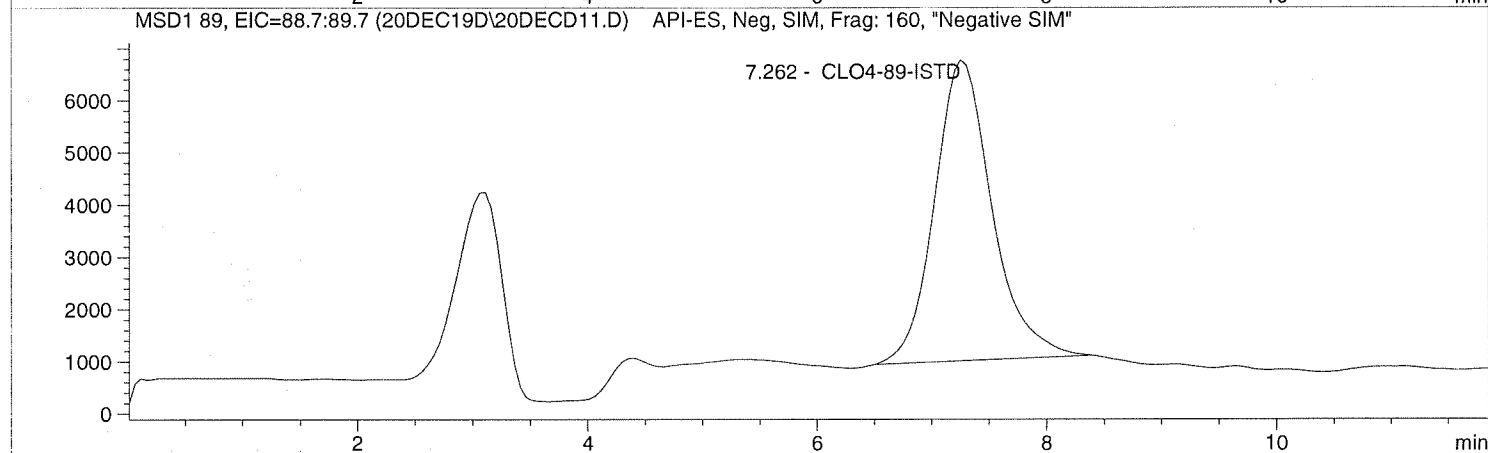
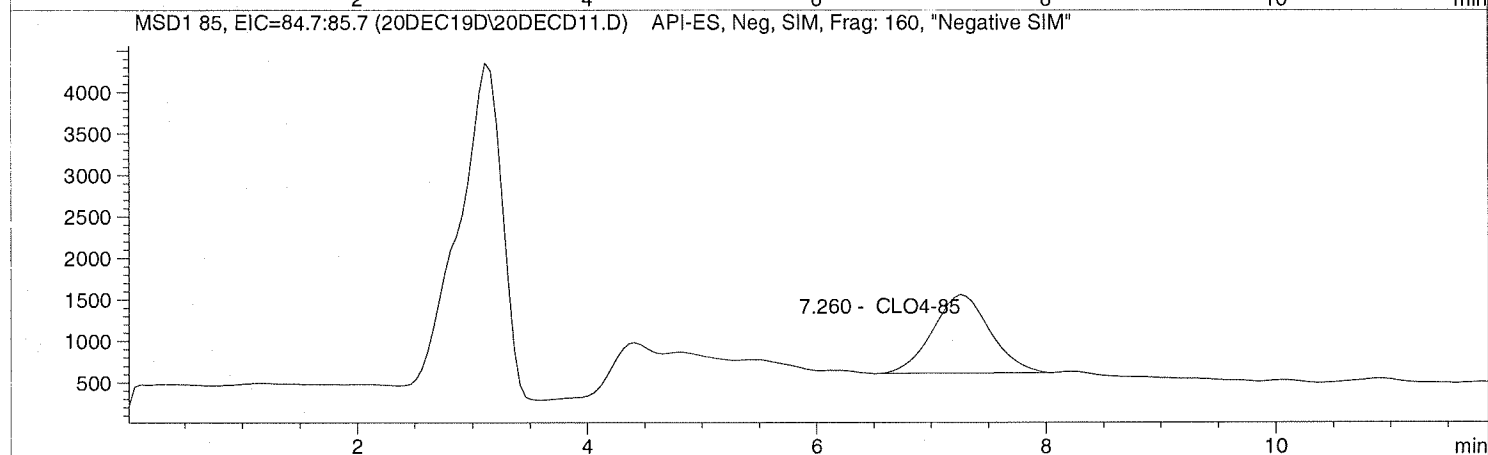
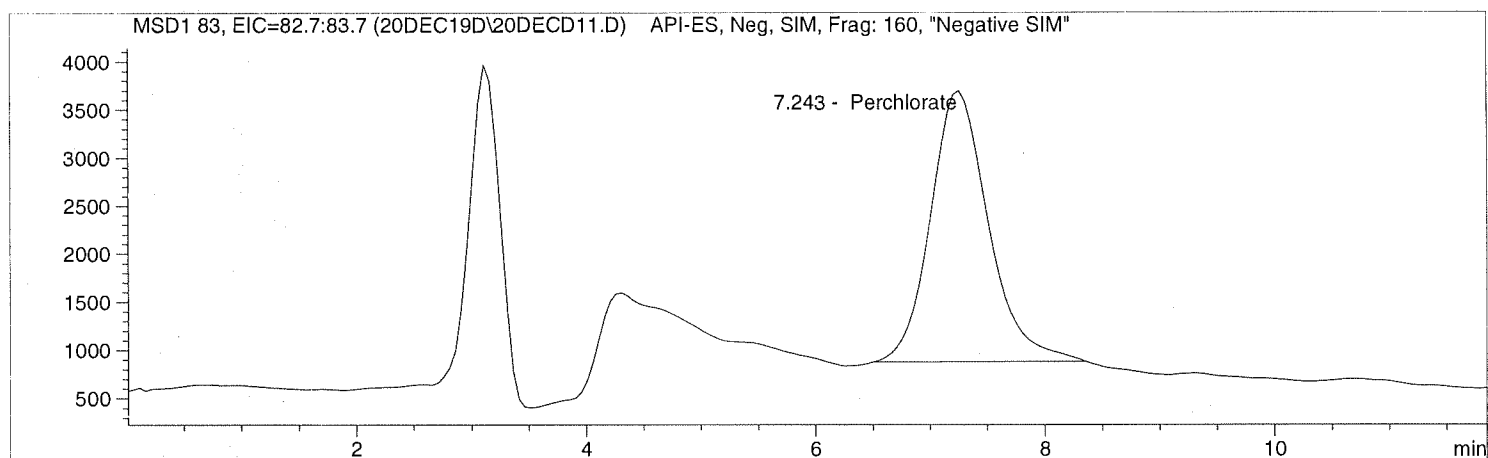
Sample Name: 1934851005

Injection Date: 12/20/2019 15:39:24
Sample Name: 1934851005
Acq Operator: TNB

Seq Line: 11
Location: Vial 81
Inj. No.: 1
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20DEC19D\20DEC11.D

Sample Name: 1934851005

```

=====
Injection Date: 12/20/2019 15:39:24      Seq Line:      11
Sample Name:   1934851005                 Location:      Vial 81
Acq Operator:  TNB                        Inj. No.:     1
                                           Inj. Vol.:    35 µl
=====

```

```

Acq. Method:   CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:  11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:    1.000000
Dilution:      1.000000
Sample Amount: 0.000
=====

```

```

=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.243	PBA	98345.9	1.7879	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.260	PBA	32799.0	1.8724	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.262	PBA	199853.9	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```


Data file: C:\HPCHEM\1\DATA\20DEC19D\20DEC12.D

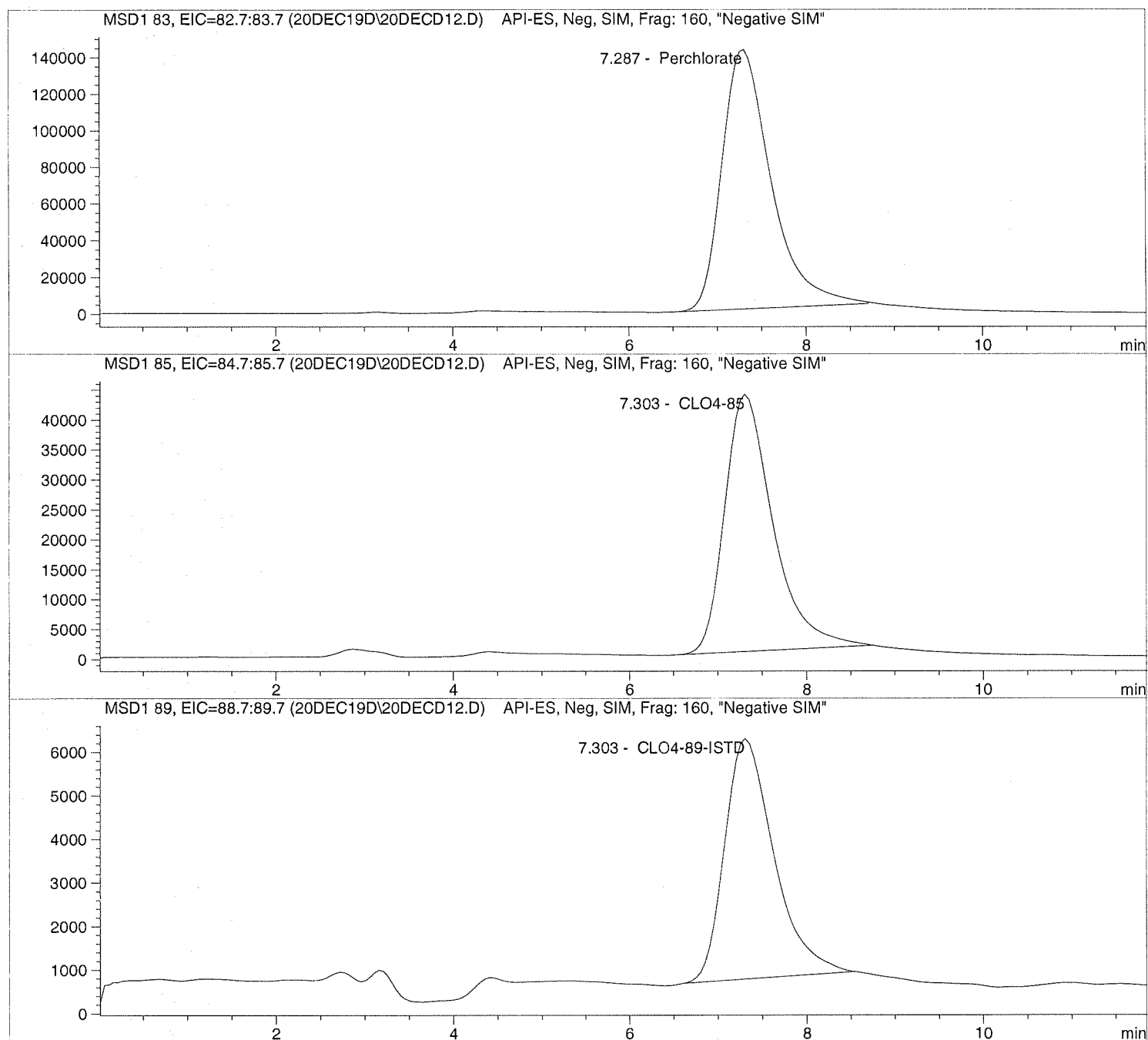
Sample Name: 1934851006

=====
Injection Date: 12/20/2019 15:53:16
Sample Name: 1934851006
Acq Operator: TNB

Seq Line: 12
Location: Vial 82
Inj. No.: 1
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20DEC19D\20DECD12.D Sample Name: 1934851006

```

=====
Injection Date: 12/20/2019 15:53:16      Seq Line:          12
Sample Name:   1934851006                Location:          Vial 82
Acq Operator:  TNB                       Inj. No.:         1
                                           Inj. Vol.:        35 µl
=====

```

```

Acq. Method:   CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:  11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:          Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:         1.000000
Dilution:           1.000000
Sample Amount:      0.000
=====

```

```

=====
                          LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.287	PBA	5442572.0	72.5354	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.303	PBA	1626533.5	72.0976	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.303	PBA	213698.1	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\20DEC19D\20DECD13.D

Sample Name: 1934851007 100

Injection Date: 12/20/2019 16:07:07

Seq Line: 13

Sample Name: 1934851007 100

Location: Vial 83

Acq Operator: TNB

Inj. No.: 1

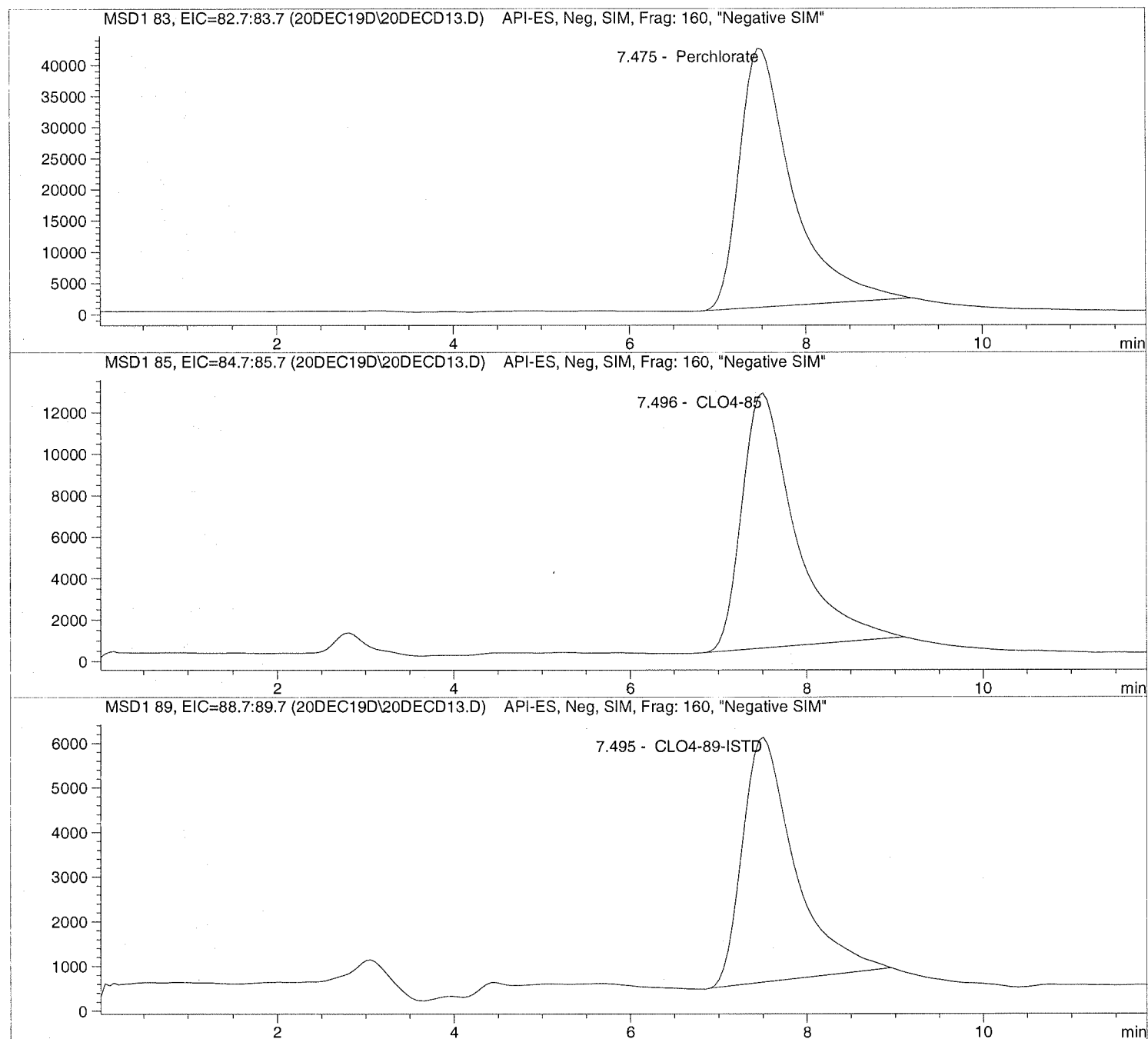
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M

Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20DEC19D\20DEC13.D Sample Name: 1934851007 100

```

=====
Injection Date: 12/20/2019 16:07:07      Seq Line:      13
Sample Name:   1934851007 100             Location:      Vial 83
Acq Operator:  TNB                       Inj. No.:     1
                                           Inj. Vol.:    35 µl

```

```

Acq. Method:   CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:  11/5/2019 08:44:45

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:    1.000000
Dilution:      100.000000
Sample Amount: 0.000

```

```

=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.475	PBA	1739525.5	2605.9612	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.496	PBA	514969.0	2537.4708	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.495	PBA	227091.5	500.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\20DEC19D\20DECD14.D

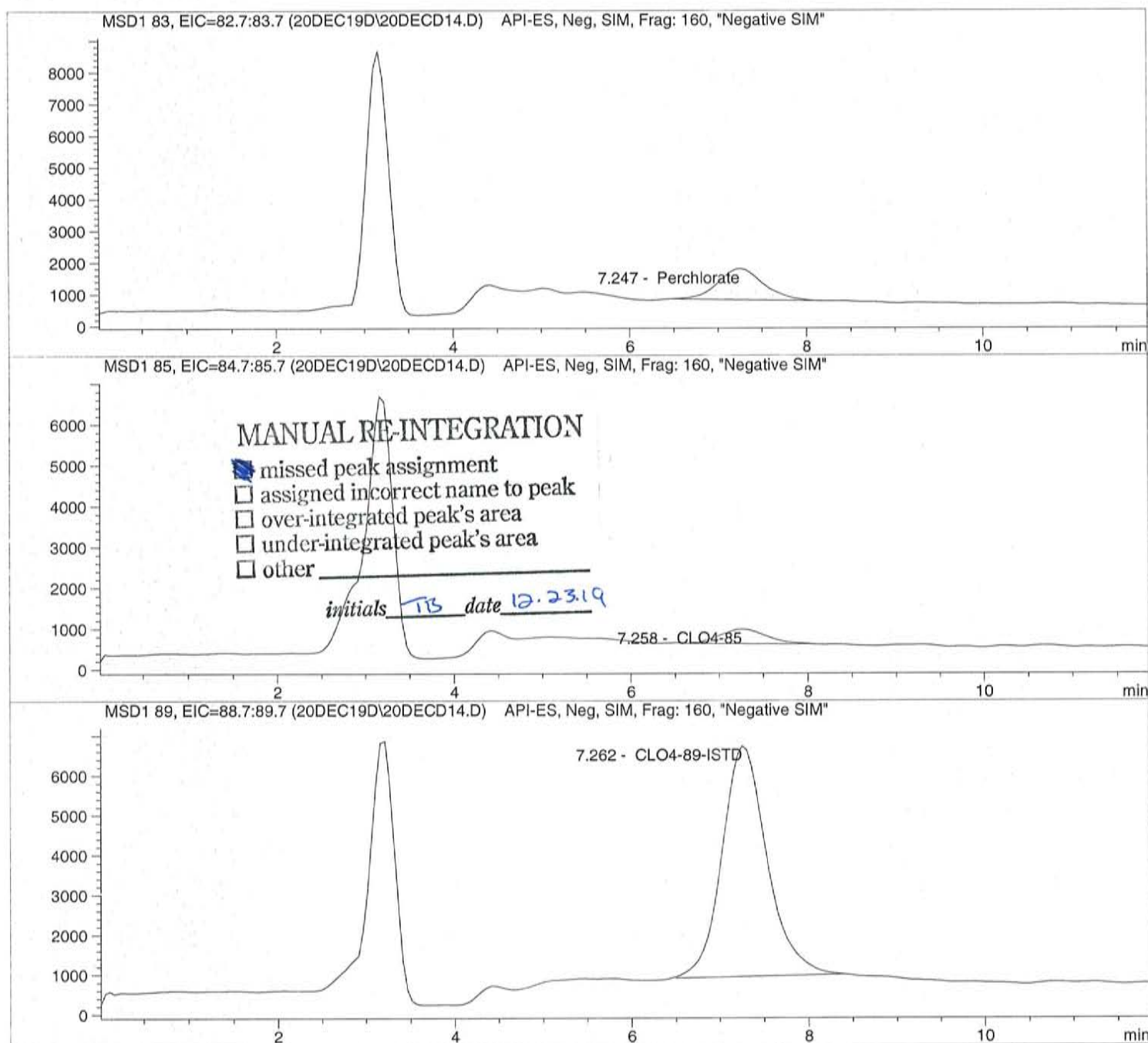
Sample Name: 1935316001

=====
 Injection Date: 12/20/2019 16:20:57
 Sample Name: 1935316001
 Acq Operator: TNB

Seq Line: 14
 Location: Vial 84
 Inj. No.: 1
 Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M
 Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
 Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20DEC19D\20DECD14.D Sample Name: 1935316001

```

=====
Injection Date: 12/20/2019 16:20:57      Seq Line:          14
Sample Name:    1935316001                Location:          Vial 84
Acq Operator:   TNB                       Inj. No.:         1
                                           Inj. Vol.:        35 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  0.000
=====

```

```

=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.247	PBA	35246.8	0.5749	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.258	MM	13171.3	0.6371	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.262	BBA	204617.7	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\20DEC19D\20DECD15.D

Sample Name: 689414 CCV@25

Injection Date: 12/20/2019 16:34:50

Seq Line: 15

Sample Name: 689414 CCV@25

Location: Vial 71

Acq Operator: TNB

Inj. No.: 1

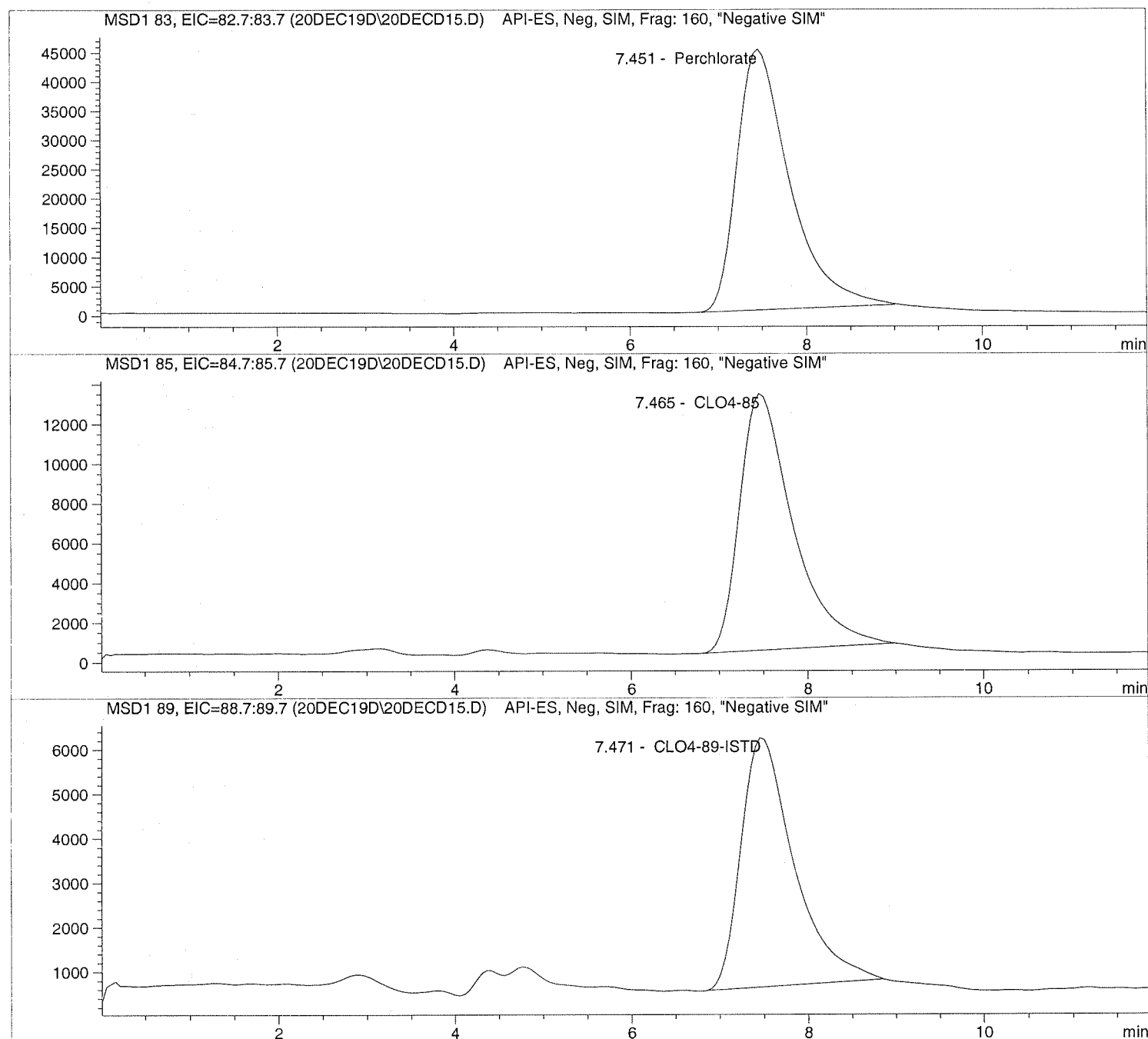
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M

Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20DEC19D\20DECD15.D Sample Name: 689414 CCV@25

```

=====
Injection Date: 12/20/2019 16:34:50      Seq Line:          15
Sample Name:   689414   CCV@25           Location:         Vial 71
Acq Operator:  TNB                               Inj. No.:        1
                                           Inj. Vol.:       35 µl
=====

```

```

Acq. Method:   CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:  11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:    1.000000
Dilution:      1.000000
Sample Amount: 25.000
=====

```

```

=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.451	PBA	1840359.7	26.7545	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.465	PBA	538678.8	25.7913	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.471	PBA	233347.4	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```


Data file: C:\HPCHEM\1\DATA\20DEC19D\20DEC16.D

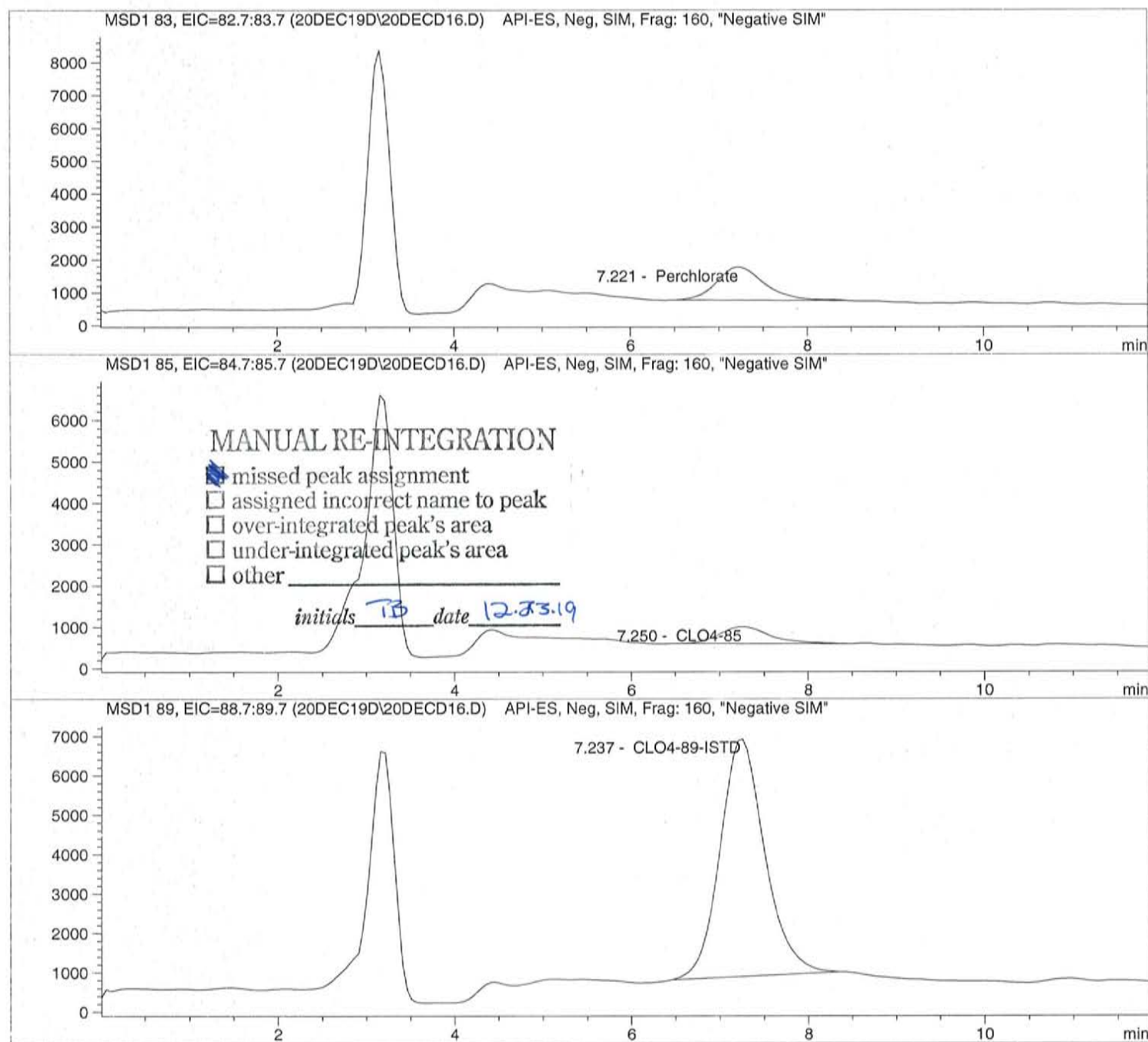
Sample Name: 1935316002

Injection Date: 12/20/2019 16:48:43
Sample Name: 1935316002
Acq Operator: TNB

Seq Line: 16
Location: Vial 85
Inj. No.: 1
Inj. Vol.: 35 μ l

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20DEC19D\20DECD16.D

Sample Name: 1935316002

```

=====
Injection Date: 12/20/2019 16:48:43      Seq Line:          16
Sample Name:   1935316002                Location:          Vial 85
Acq Operator:  TNB                       Inj. No.:         1
                                           Inj. Vol.:        35 µl
=====

```

```

Acq. Method:   CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:  11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:          Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:        1.000000
Dilution:          1.000000
Sample Amount:     0.000
=====

```

```

=====
                          LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.221	PBA	37711.6	0.6019	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.250	MM	16316.8	0.8016	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.237	PBA	210291.4	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\20DEC19D\20DEC17.D

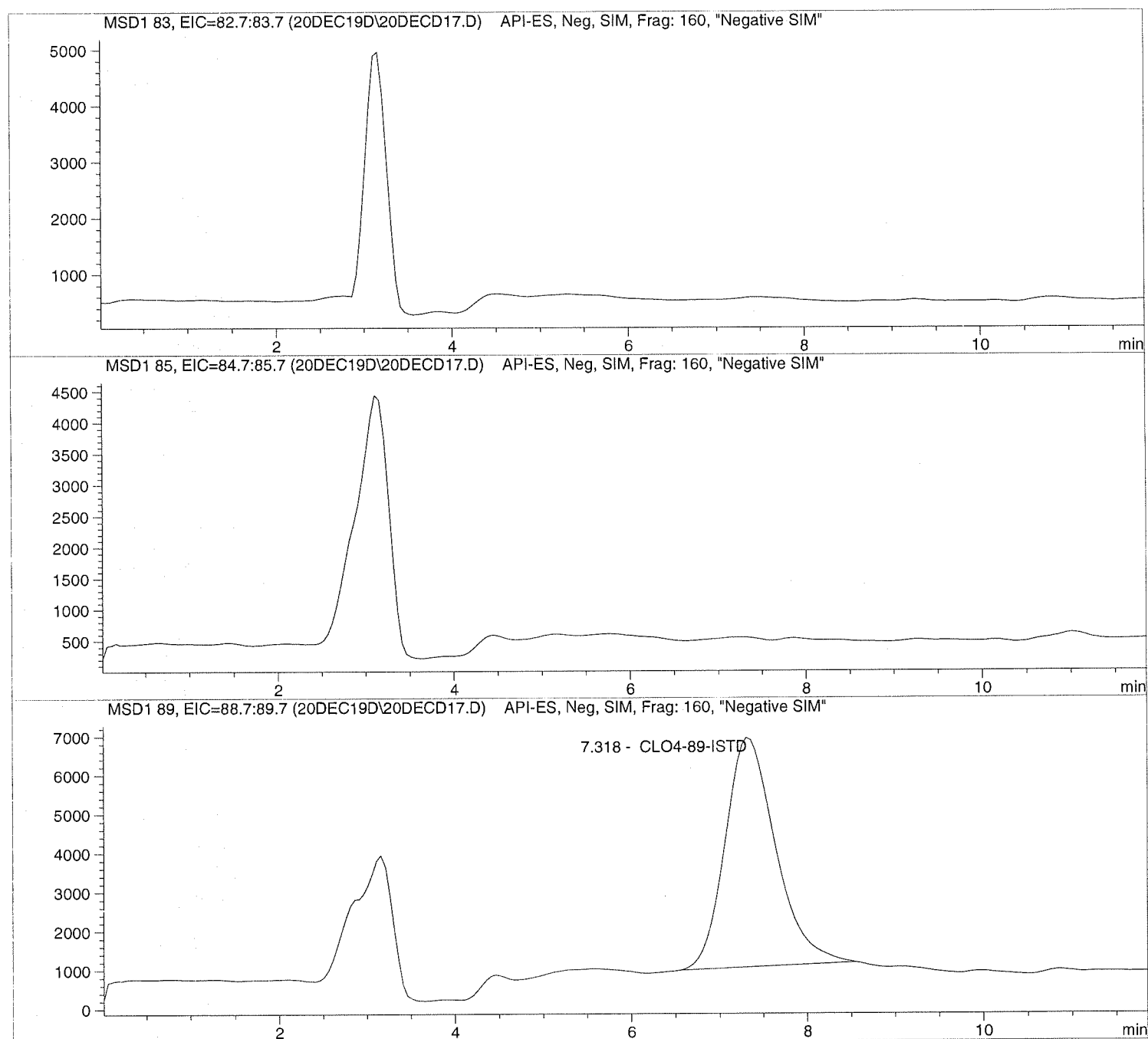
Sample Name: 1935316003

=====
Injection Date: 12/20/2019 17:02:35
Sample Name: 1935316003
Acq Operator: TNB

Seq Line: 17
Location: Vial 86
Inj. No.: 1
Inj. Vol.: 35 μ l

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20DEC19D\20DECD17.D

Sample Name: 1935316003

```

=====
Injection Date: 12/20/2019 17:02:35      Seq Line:          17
Sample Name:   1935316003                Location:          Vial 86
Acq Operator:  TNB                       Inj. No.:         1
                                           Inj. Vol.:       35 µl
=====

```

```

Acq. Method:   CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:  11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:    1.000000
Dilution:      1.000000
Sample Amount: 0.000
=====

```

```

=====
                          LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.318	PBA	235611.6	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\20DEC19D\20DEC18.D

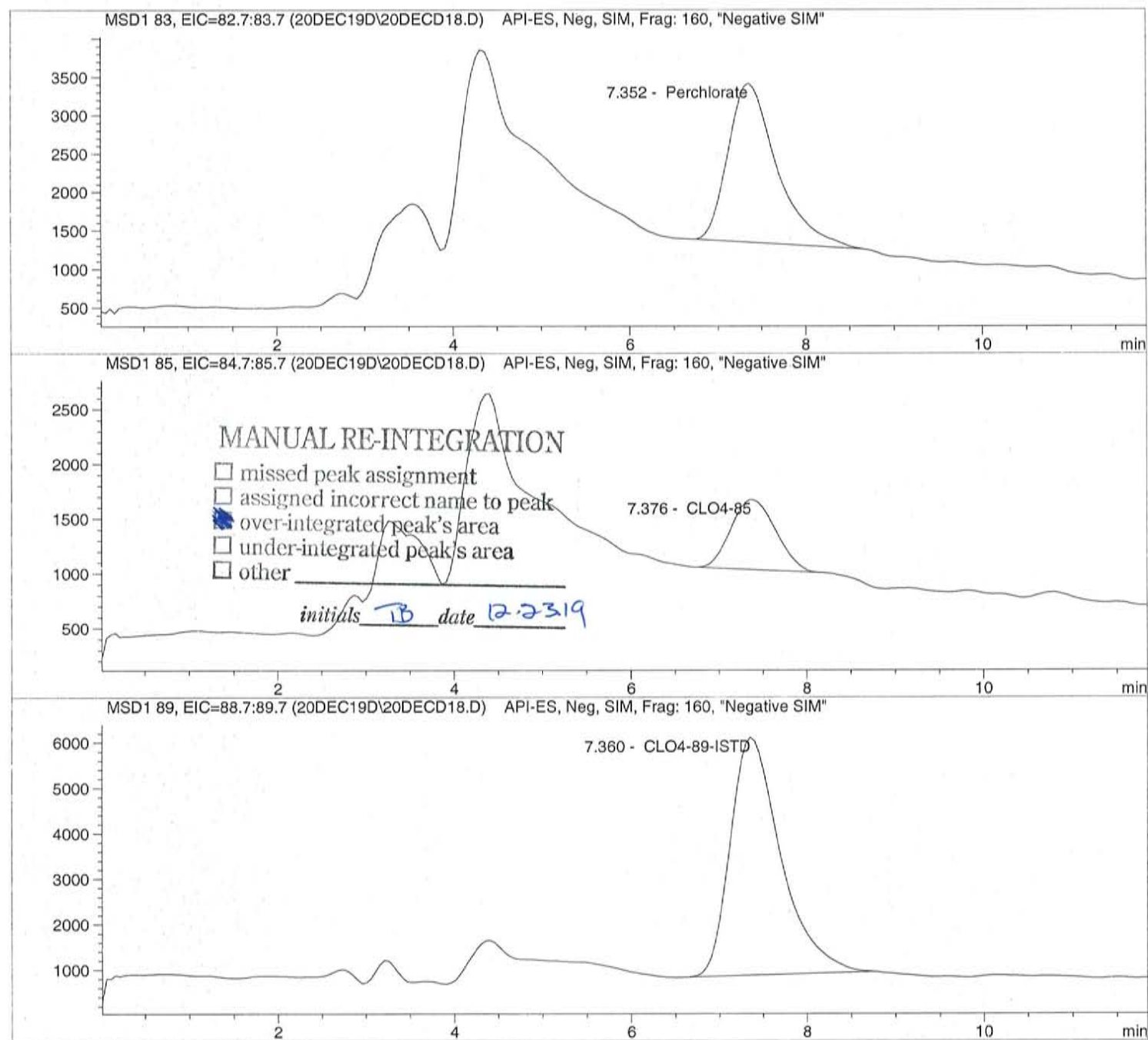
Sample Name: 1935316004

=====
Injection Date: 12/20/2019 17:16:32
Sample Name: 1935316004
Acq Operator: TNB

Seq Line: 18
Location: Vial 87
Inj. No.: 1
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20DEC19D\20DECD18.D

Sample Name: 1935316004

```

=====
Injection Date: 12/20/2019 17:16:32      Seq Line:          18
Sample Name:   1935316004                Location:          Vial 87
Acq Operator:  TNB                       Inj. No.:         1
                                           Inj. Vol.:        35 µl
=====

```

```

Acq. Method:   CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:  11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  0.000
=====

```

```

=====
                          LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.352	PBA	79516.8	1.3684	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.376	MM	22677.9	1.1875	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.360	PBA	208671.3	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\20DEC19D\20DEC19.D

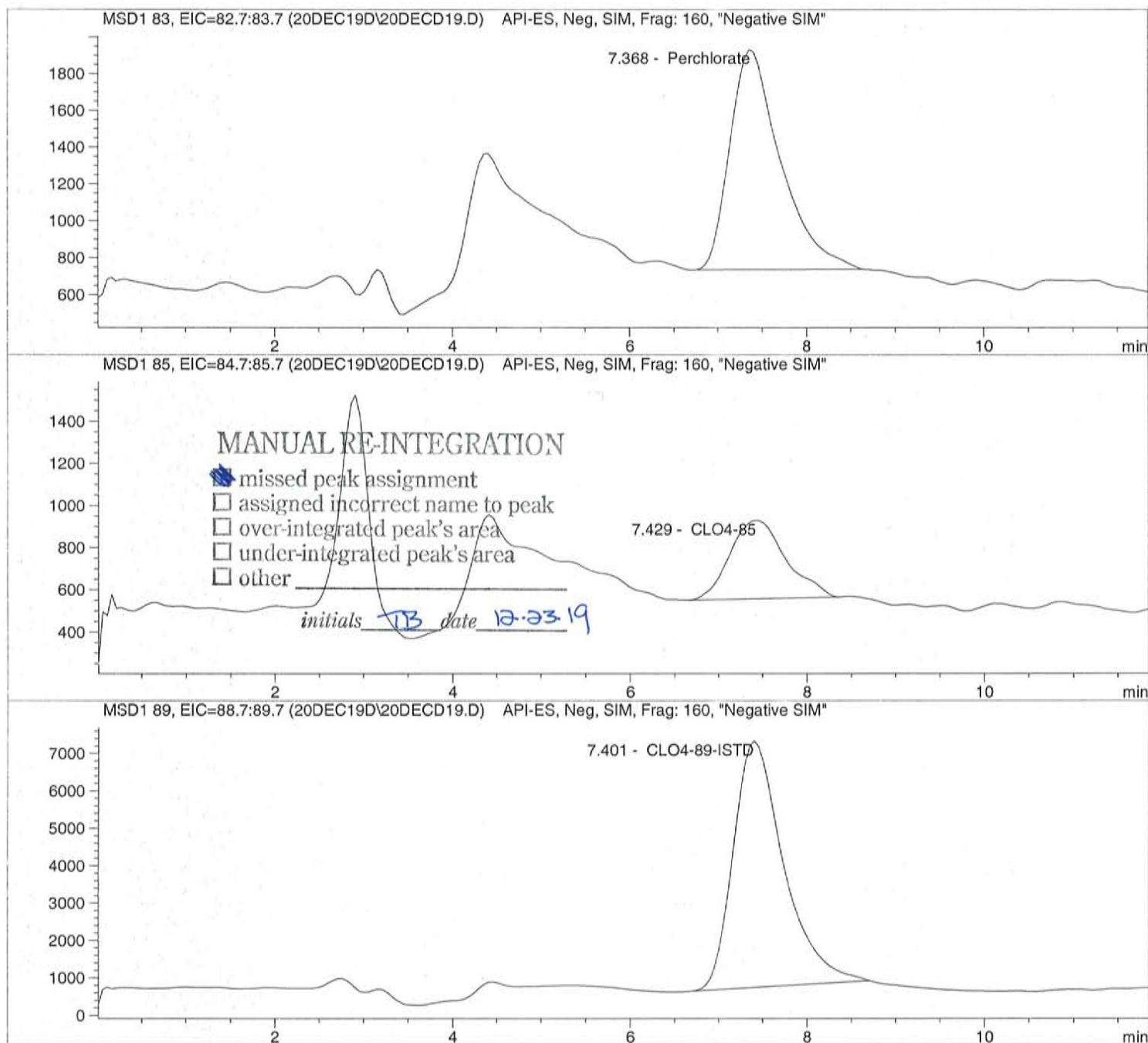
Sample Name: 1935343001

Injection Date: 12/20/2019 17:30:23
Sample Name: 1935343001
Acq Operator: TNB

Seq Line: 19
Location: Vial 88
Inj. No.: 1
Inj. Vol.: 35 μ l

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20DEC19D\20DEC19.D Sample Name: 1935343001

```

=====
Injection Date: 12/20/2019 17:30:23      Seq Line: 19
Sample Name: 1935343001                  Location: Vial 88
Acq Operator: TNB                         Inj. No.: 1
                                           Inj. Vol.: 35 µl
=====

```

```

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By: Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 0.000
=====

```

```

=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.368	PBA	47484.7	0.6123	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.429	MM	16333.7	0.6154	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.401	PBA	260797.0	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```


Data file: C:\HPCHEM\1\DATA\20DEC19D\20DECD20.D

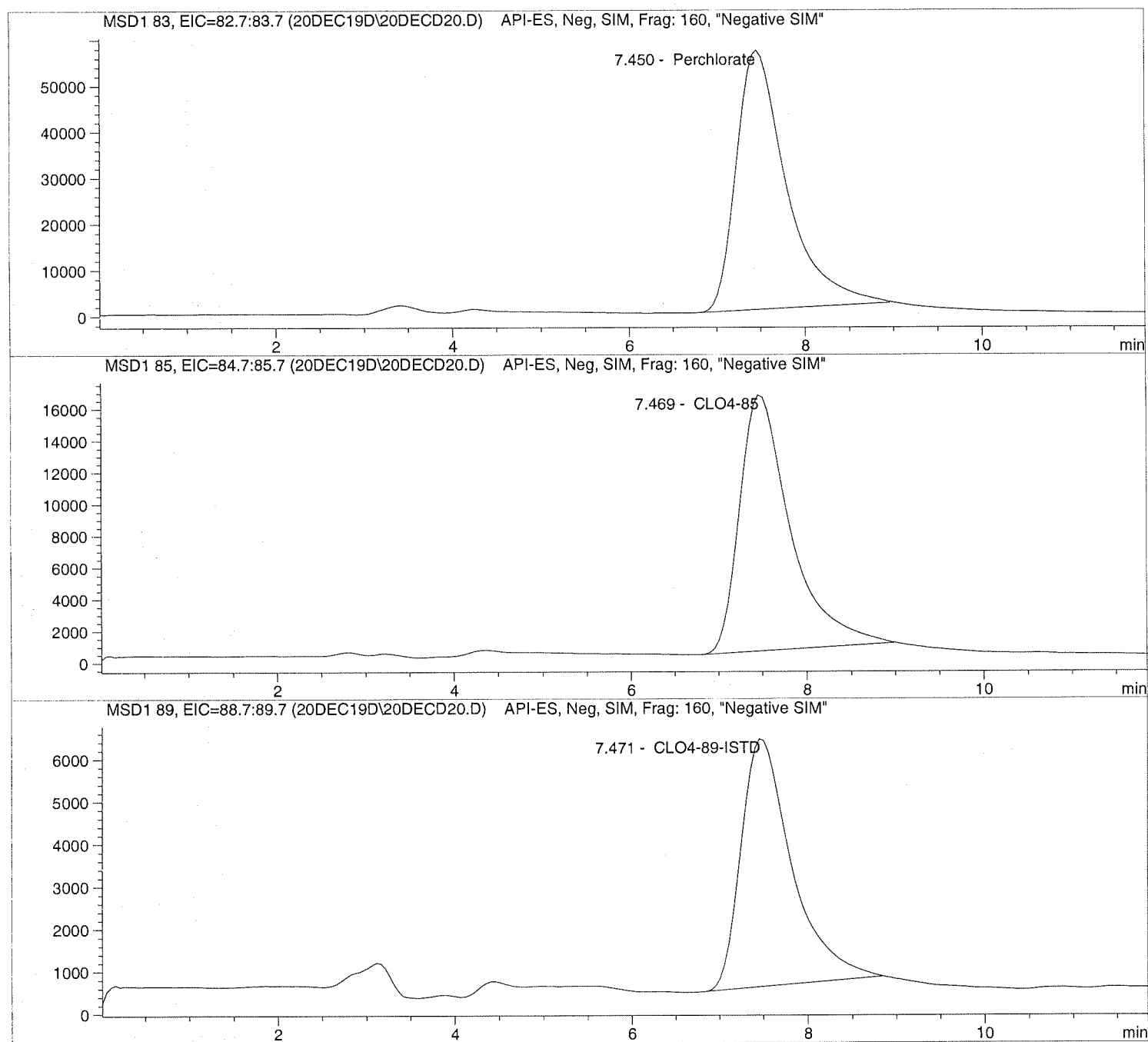
Sample Name: 1935343002

Injection Date: 12/20/2019 17:44:18
Sample Name: 1935343002
Acq Operator: TNB

Seq Line: 20
Location: Vial 89
Inj. No.: 1
Inj. Vol.: 35 μ l

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20DEC19D\20DECD20.D Sample Name: 1935343002

```

=====
Injection Date: 12/20/2019 17:44:18      Seq Line: 20
Sample Name:    1935343002                Location:  Vial 89
Acq Operator:   TNB                       Inj. No.: 1
                                           Inj. Vol.: 35 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:    1.000000
Dilution:      1.000000
Sample Amount: 0.000
=====

```

```

=====
                          LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.450	PBA	2218208.3	31.6741	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.469	PBA	646837.8	30.4960	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.471	PBA	232847.2	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\20DEC19D\20DECD21.D

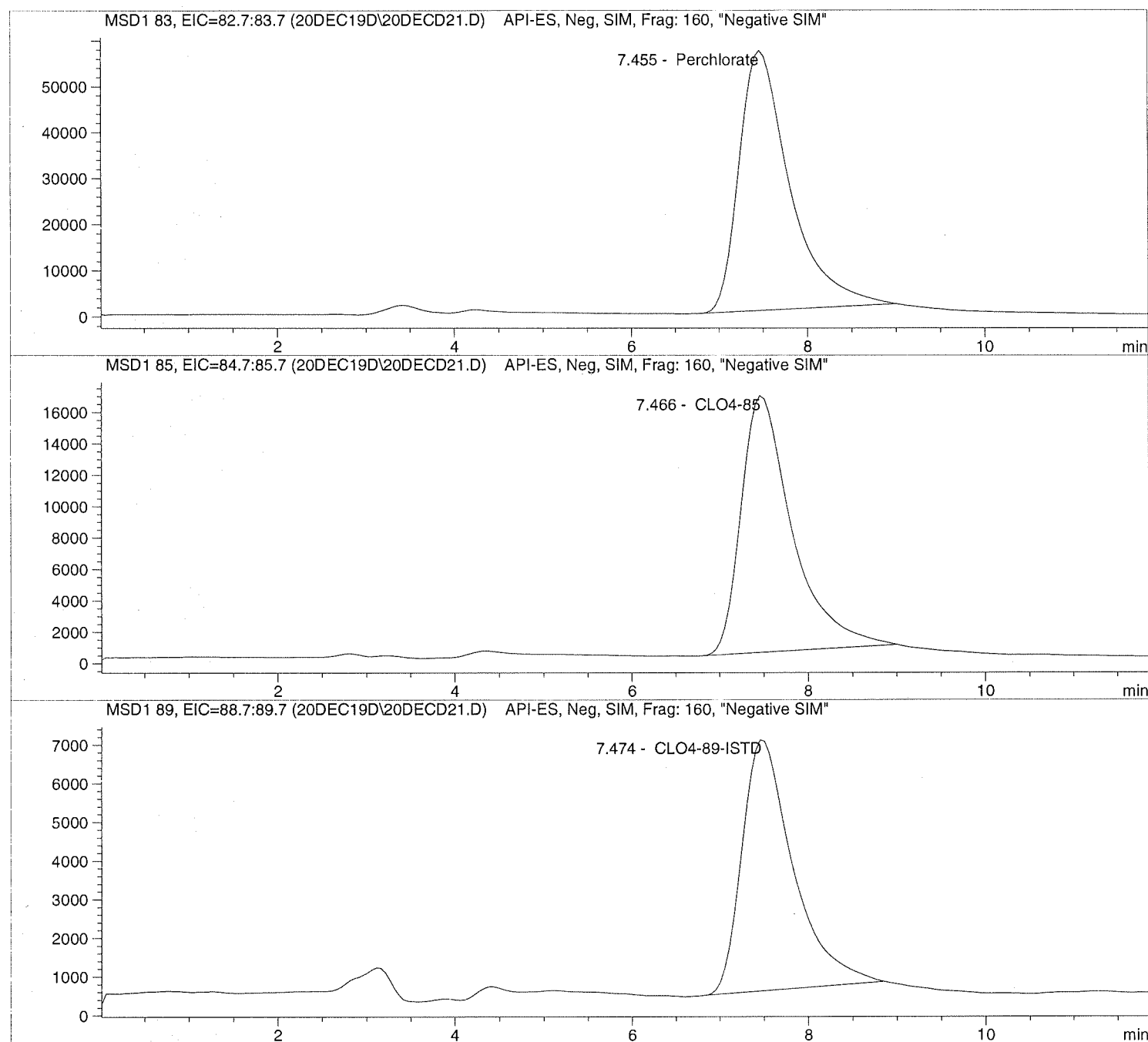
Sample Name: 1935343003

=====
Injection Date: 12/20/2019 17:58:10
Sample Name: 1935343003
Acq Operator: TNB

Seq Line: 21
Location: Vial 90
Inj. No.: 1
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20DEC19D\20DECD21.D Sample Name: 1935343003

```

=====
Injection Date: 12/20/2019 17:58:10      Seq Line:          21
Sample Name:    1935343003                Location:          Vial 90
Acq Operator:   TNB                       Inj. No.:         1
                                           Inj. Vol.:       35 µl

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   11/5/2019 08:44:45

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  0.000

```

```

=====
                          LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.455	PBA	2245223.3	28.9532	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.466	PBA	655399.1	27.8698	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.474	PBA	260703.4	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***

```

Data file: C:\HPCHEM\1\DATA\20DEC19D\20DECD22.D

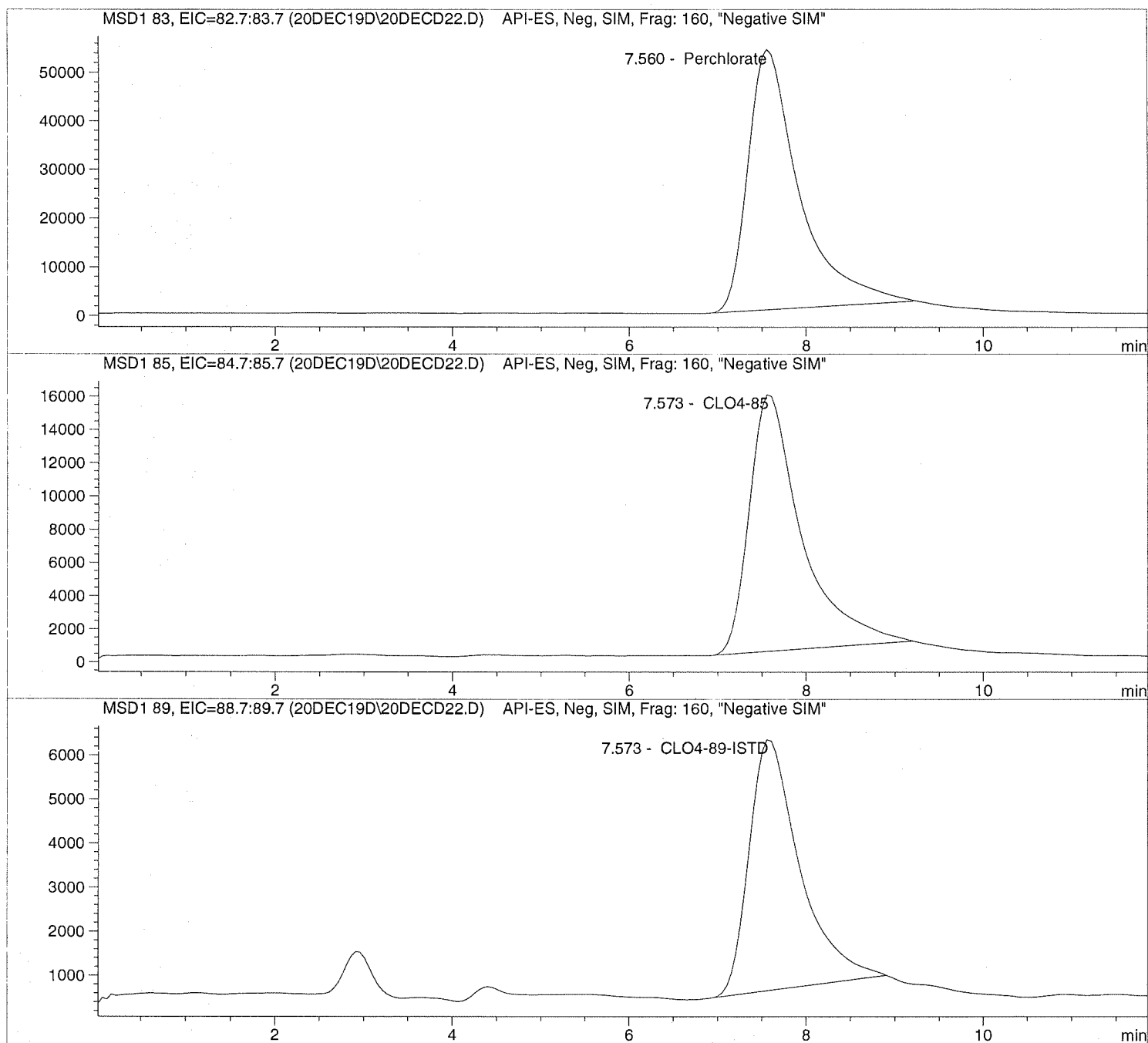
Sample Name: 1935343004 1K

=====
Injection Date: 12/20/2019 18:12:05
Sample Name: 1935343004 1K
Acq Operator: TNB

Seq Line: 22
Location: Vial 91
Inj. No.: 1
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20DEC19D\20DECD22.D Sample Name: 1935343004 1K

```

=====
Injection Date: 12/20/2019 18:12:05      Seq Line:      22
Sample Name:   1935343004 1K             Location:      Vial 91
Acq Operator:  TNB                       Inj. No.:     1
                                           Inj. Vol.:    35 µl
=====

```

```

Acq. Method:   CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:  11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:    1.000000
Dilution:      1000.000000
Sample Amount: 0.000
=====

```

```

=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.560	PBA	2155972.7	31691.1790	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.573	PBA	633070.0	30703.4059	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.573	PBA	226176.3	5000.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

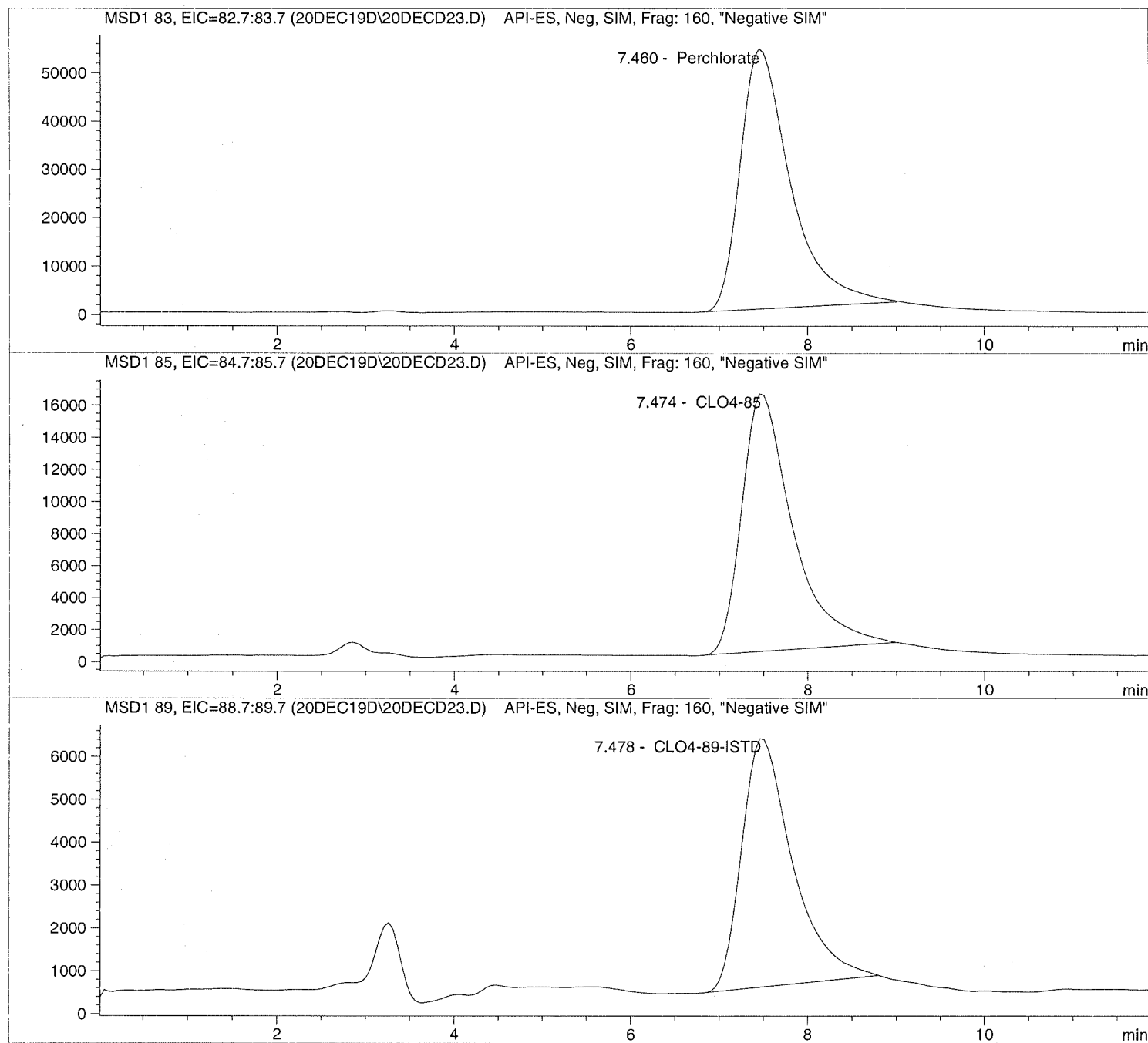
```

Data file: C:\HPCHEM\1\DATA\20DEC19D\20DECD23.D Sample Name: 1935343005 10X

```
=====
Injection Date: 12/20/2019 18:25:57      Seq Line:      23
Sample Name:    1935343005 10X           Location:      Vial 92
Acq Operator:   TNB                      Inj. No.:     1
                                           Inj. Vol.:    35 µl
=====
```

```
Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   11/5/2019 08:44:45
=====
```

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20DEC19D\20DECD23.D Sample Name: 1935343005 10X

```

=====
Injection Date: 12/20/2019 18:25:57      Seq Line:          23
Sample Name:   1935343005 10X           Location:         Vial 92
Acq Operator:  TNB                      Inj. No.:        1
                                           Inj. Vol.:       35 µl
=====

```

```

Acq. Method:   CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:  11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:    1.000000
Dilution:     10.000000
Sample Amount: 0.000
=====

```

```

=====
                          LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.460	PBA	2142509.0	306.2809	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.474	PBA	646073.3	303.7870	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.478	PBA	233571.8	50.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

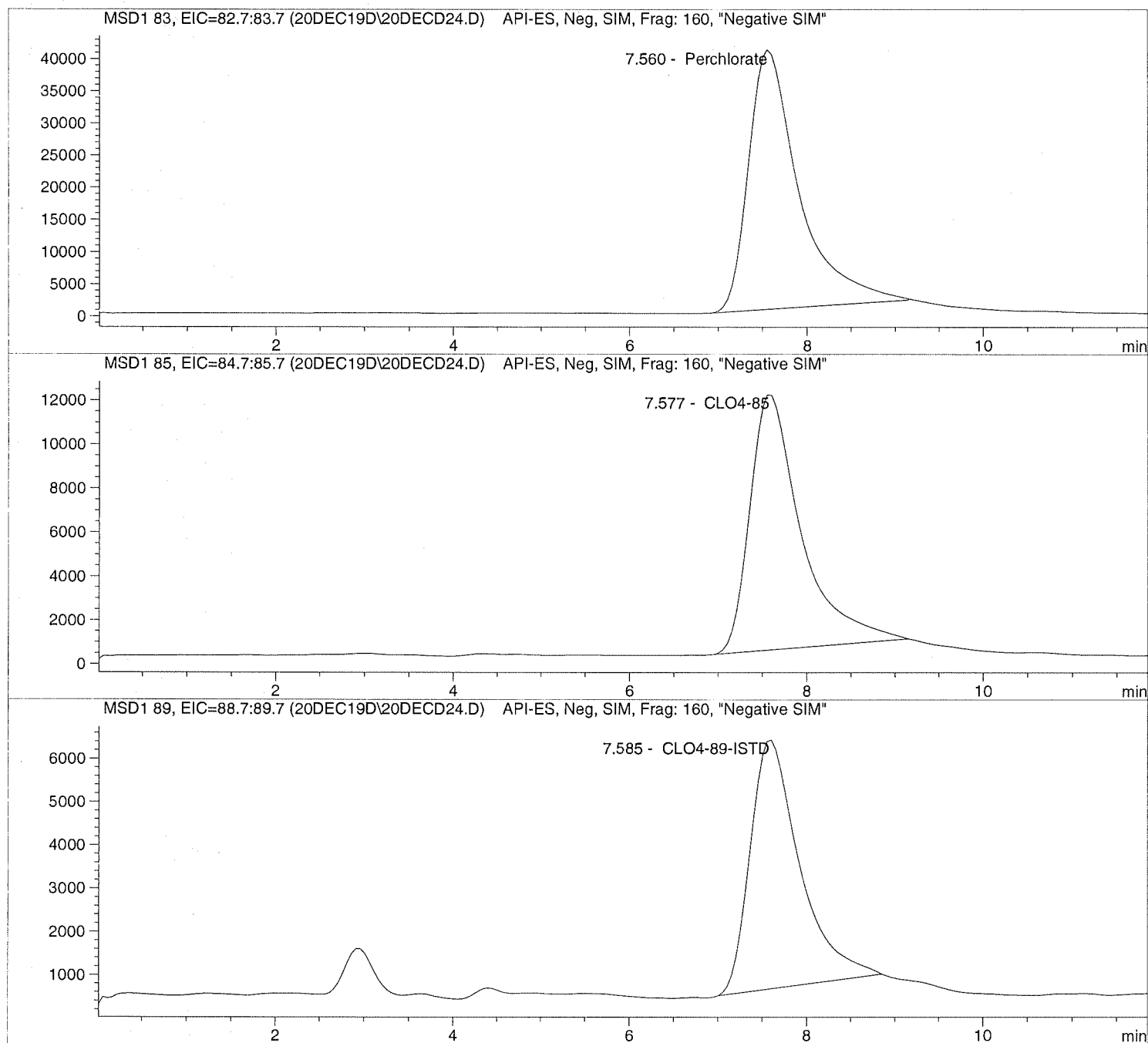
```


Data file: C:\HPCHEM\1\DATA\20DEC19D\20DECD24.D Sample Name: 1935343006 1K

```
=====
Injection Date: 12/20/2019 18:39:48      Seq Line:      24
Sample Name:    1935343006 1K            Location:      Vial 93
Acq Operator:   TNB                      Inj. No.:     1
                                           Inj. Vol.:    35 µl
=====
```

```
Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   11/5/2019 08:44:45
```

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20DEC19D\20DECD24.D Sample Name: 1935343006 1K

```

=====
Injection Date: 12/20/2019 18:39:48      Seq Line:      24
Sample Name:    1935343006 1K           Location:      Vial 93
Acq Operator:   TNB                     Inj. No.:     1
                                           Inj. Vol.:    35 µl
  
```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   11/5/2019 08:44:45
  
```

Perchlorate analysis

Sample Information

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1000.000000
Sample Amount:  0.000
  
```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.560	PBA	1595449.5	24449.8022	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.577	PBA	466349.3	23513.4271	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.585	PBA	223474.0	5000.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\20DEC19D\20DECD26.D

Sample Name: 689415 CCV@25

Injection Date: 12/20/2019 19:07:32

Seq Line: 26

Sample Name: 689415 CCV@25

Location: Vial 71

Acq Operator: TNB

Inj. No.: 1

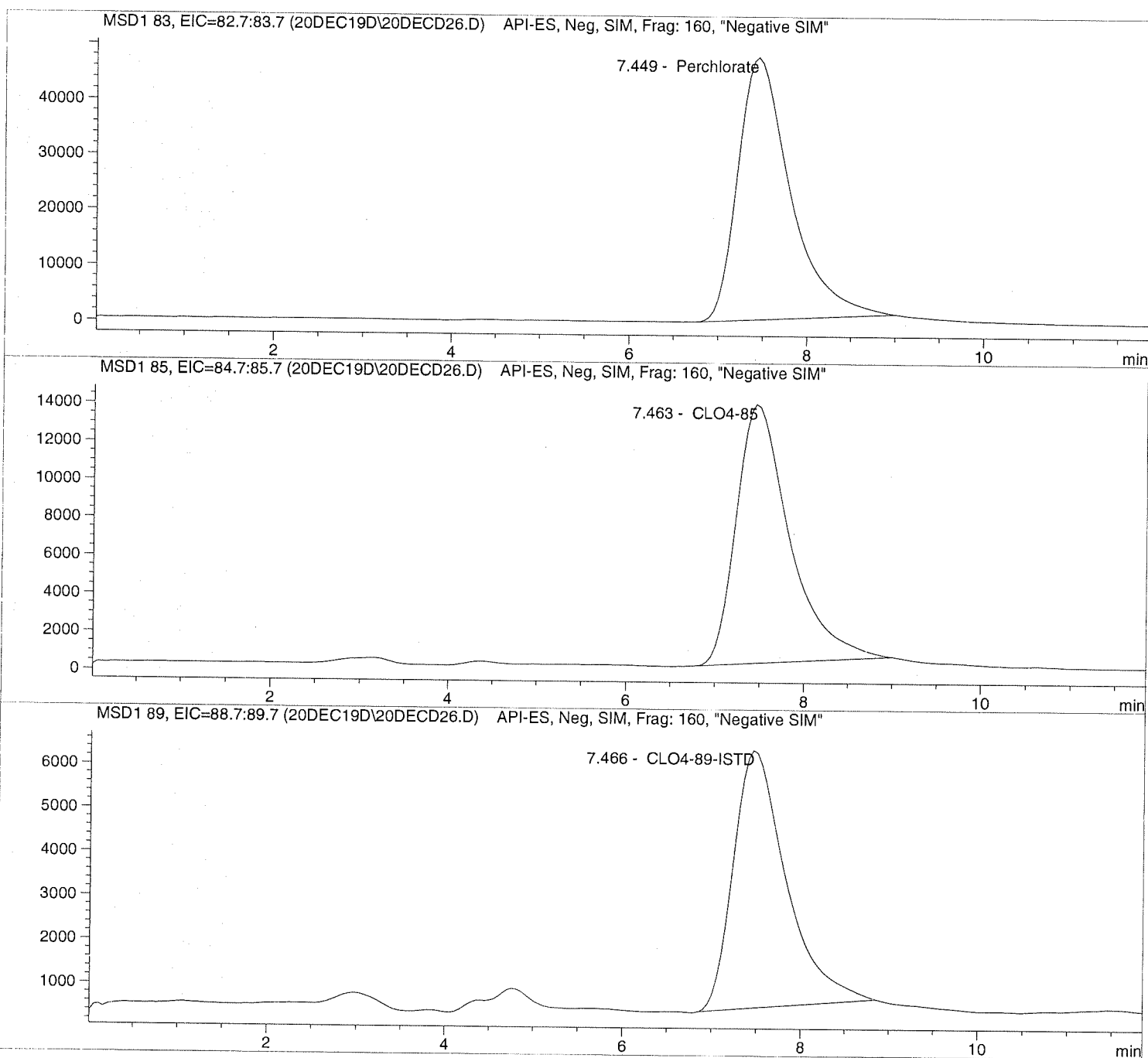
Inj. Vol.: 35 μ l

Acq. Method: CLO4-AQN.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M

Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20DEC19D\20DEC19D26.D Sample Name: 689415 CCV@25

```
=====
Injection Date: 12/20/2019 19:07:32      Seq Line:           26
Sample Name:    689415  CCV@25           Location:           Vial 71
Acq Operator:   TNB                       Inj. No.:          1
                                           Inj. Vol.:         35 µl
=====
```

```
Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   11/5/2019 08:44:45
=====
```

Perchlorate analysis

```
=====
                          Sample Information
=====
```

```
Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  25.000
```

```
=====
                          LCMS Results
=====
```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.449	PBA	1939760.0	27.0663	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.463	PBA	567687.4	26.0920	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.466	PBA	242806.7	5.0000	CLO4-89-ISTD

```
=====
*** End of Report ***
=====
```



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

**Initial
Calibration**

```

=====
                        Calibration Table
=====

```

Perchlorate

Calib. Data Modified : 9/23/2019 12:20:59 PM

Calculate : Internal Standard

Based on : Peak Area

Rel. Reference Window : 20.000 %

Abs. Reference Window : 0.000 min

Rel. Non-ref. Window : 20.000 %

Abs. Non-ref. Window : 0.000 min

Use Multiplier & Dilution Factor with ISTDs

Uncalibrated Peaks : not reported

Partial Calibration : No recalibration if peaks missing

Curve Type : Quadratic (some peaks differ, see below)

Origin : Ignored (some peaks differ, see below)

Weight : Linear (Amnt) (some peaks differ, see below)

Recalibration Settings:

Average Response : Average all calibrations

Average Retention Time: Floating Average New 75%

Calibration Report Options :

Printout of recalibrations within a sequence:

Calibration Table after Recalibration

Normal Report after Recalibration

If the sequence is done with bracketing:

Results of first cycle (ending previous bracket)

Default Sample ISTD Information (if not set in sample table):

ISTD ISTD Amount Name

#

```

-----|-----|-----
 1      5.00000  CLO4-89-ISTD

```

Signal 1: MSD1 83, EIC=82.7:83.7

Signal 2: MSD1 85, EIC=84.7:85.7

Signal 3: MSD1 89, EIC=88.7:89.7

RetTime	Lvl	Amount	Area	Amt/Area	Ref Grp	Name
[min]	Sig					
7.750	1 3	1.00000	5.39218e4	1.85454e-5	1	Perchlorate
	4	2.00000	1.32825e5	1.50574e-5		
	5	5.00000	2.76271e5	1.80982e-5		
	6	10.00000	5.61298e5	1.78159e-5		
	7	25.00000	1.51820e6	1.64669e-5		
	8	50.00000	3.31156e6	1.50986e-5		
	9	75.00000	5.23914e6	1.43153e-5		
7.767	3 3	5.00000	2.14568e5	2.33026e-5	+I1	CLO4-89-ISTD
	4	5.00000	2.04758e5	2.44190e-5		
	5	5.00000	2.13407e5	2.34294e-5		
	6	5.00000	2.09246e5	2.38953e-5		
	7	5.00000	2.07403e5	2.41077e-5		
	8	5.00000	2.02929e5	2.46391e-5		
	9	5.00000	1.97933e5	2.52611e-5		
7.778	2 3	1.00000	1.70436e4	5.86732e-5	1	CLO4-85
	4	2.00000	4.20754e4	4.75337e-5		
	5	5.00000	9.24707e4	5.40712e-5		
	6	10.00000	1.68622e5	5.93041e-5		
	7	25.00000	4.63724e5	5.39114e-5		
	8	50.00000	9.95933e5	5.02042e-5		

RetTime [min]	Lvl Sig	Amount	Area	Amt/Area	Ref Grp Name
-----	-----	-----	-----	-----	-----
9		75.00000	1.58066e6	4.74484e-5	

More compound-specific settings:

Compound: Perchlorate

Time Window : From 3.581 min To 11.899 min
Curve Type : Quadratic
Origin : Ignored
Calibration Level Weights:/
Level 3 : 1
Level 4 : 0.5
Level 5 : 0.2
Level 6 : 0.1
Level 7 : 0.04
Level 8 : 0.02
Level 9 : 0.013333

Compound: CLO4-89-ISTD

Time Window : From 3.581 min To 11.896 min
Curve Type : Linear
Origin : Included
Calibration Level Weights:/
Level 3 : 1
Level 4 : 1
Level 5 : 1
Level 6 : 1
Level 7 : 1
Level 8 : 1
Level 9 : 1

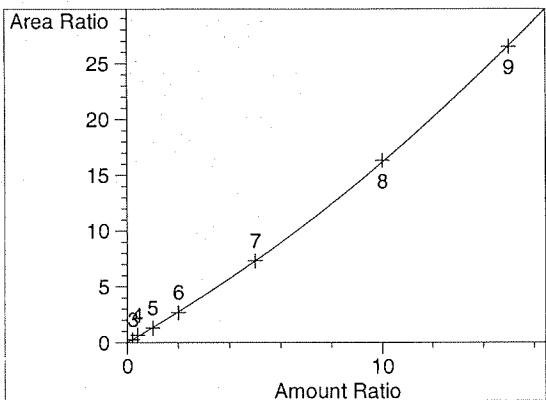
Compound: CLO4-85

Time Window : From 3.601 min To 11.913 min
Curve Type : Quadratic
Origin : Ignored
Calibration Level Weights:/
Level 3 : 1
Level 4 : 0.5
Level 5 : 0.2
Level 6 : 0.1
Level 7 : 0.04
Level 8 : 0.02
Level 9 : 0.013333

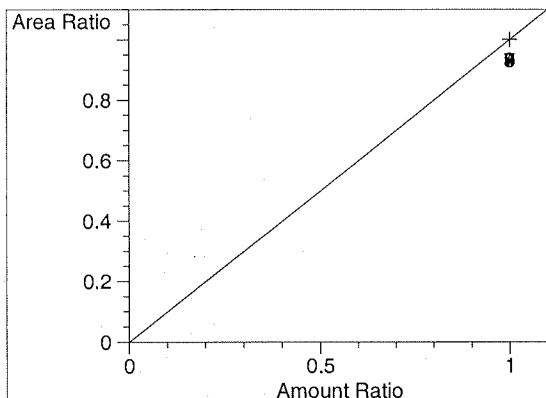
=====
Peak Sum Table
=====

No Entries in table
=====

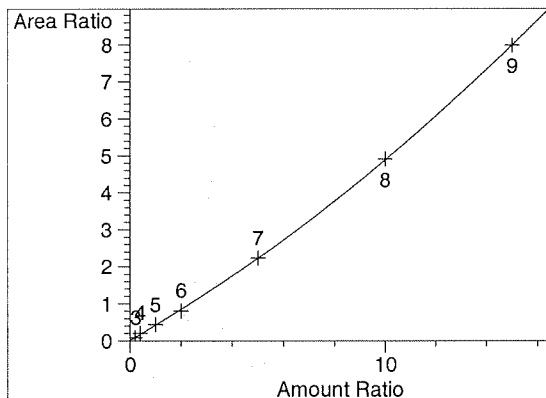
=====
 Calibration Curves
 =====



Perchlorate at exp. RT: 7.750
 MSD1 83, EIC=82.7:83.7
 Correlation: 0.99975
 Residual Std. Dev.: 0.10284
 Formula: $y = ax^2 + bx + c$
 a: 3.10463e-2
 b: 1.30369
 c: 2.19496e-2
 x: Amount Ratio
 y: Area Ratio
 Calibration Level Weights:
 Level 3 : 1
 Level 4 : 0.5
 Level 5 : 0.2
 Level 6 : 0.1
 Level 7 : 0.04
 Level 8 : 0.02
 Level 9 : 0.013333



CLO4-89-ISTD at exp. RT: 7.767
 MSD1 89, EIC=88.7:89.7
 Correlation: 1.00000
 Residual Std. Dev.: 0.00000
 Formula: $y = mx + b$
 m: 1.00000
 b: 0.00000
 x: Amount Ratio
 y: Area Ratio
 Calibration Level Weights:
 Level 3 : 1
 Level 4 : 1
 Level 5 : 1
 Level 6 : 1
 Level 7 : 1
 Level 8 : 1
 Level 9 : 1



CLO4-85 at exp. RT: 7.778
 MSD1 85, EIC=84.7:85.7
 Correlation: 0.99969
 Residual Std. Dev.: 0.02601
 Formula: $y = ax^2 + bx + c$
 a: 8.85207e-3
 b: 3.99283e-1
 c: 1.33505e-2
 x: Amount Ratio
 y: Area Ratio
 Calibration Level Weights:
 Level 3 : 1
 Level 4 : 0.5
 Level 5 : 0.2
 Level 6 : 0.1
 Level 7 : 0.04
 Level 8 : 0.02
 Level 9 : 0.013333

Batch Review Method:

C:\HPCHEM\1\METHODS\CLO4-DP3.M

['#' ==> Run has not been reprocessed with Batch Review Method

['*' ==> Run has been saved with batch file]

#*	Sample	Location	Inj	SampleType	Run	Perchlorate Area	Perchlorat RT	Perchlorate Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	5.39218e4	7.750	8.75982e-1
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	1.32825e5	7.797	2.37682
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	2.76271e5	7.770	4.77237
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	5.61298e5	7.785	9.75097
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	1.51820e6	7.741	25.01082
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	3.31156e6	7.775	50.40300
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	5.23914e6	7.736	74.79107
#*	ICAL Verf@10ug/L	Vial 80	1	Control	11	5.74879e5	7.756	10.11855

#*	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	2.14568e5	7.767	5.00000
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	2.04758e5	7.816	5.00000
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	2.13407e5	7.793	5.00000
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	2.09246e5	7.798	5.00000
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	2.07403e5	7.763	5.00000
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	2.02929e5	7.800	5.00000
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	1.97933e5	7.765	5.00000
#*	ICAL Verf@10ug/L	Vial 80	1	Control	11	2.06243e5	7.776	5.00000

#*	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	1.70436e4	7.778	8.24488e-1
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	4.20754e4	7.805	2.38090
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	9.24707e4	7.787	5.14166
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	1.68622e5	7.781	9.52209
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	4.63724e5	7.760	25.04916
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	9.95933e5	7.793	50.14223
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	1.58066e6	7.758	74.93659
#*	ICAL Verf@10ug/L	Vial 80	1	Control	11	1.71000e5	7.760	9.79043

*** End of Report ***

Sequence Table:

Method and Injection Info Part:

Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
====	=====	=====	=====	===	=====	=====	=====
1	Vial 71	CLO4@ 0.2ug/L	CLO4-AQN	1	Ctrl Samp		
2	Vial 72	CLO4@ 0.5ug/L	CLO4-AQN	1	Ctrl Samp		
3	Vial 73	CLO4@ 1.0ug/L	CLO4-AQN	1	Ctrl Samp		
4	Vial 74	CLO4@ 2.0ug/L	CLO4-AQN	1	Ctrl Samp		
5	Vial 75	CLO4@ 5.0ug/L	CLO4-AQN	1	Ctrl Samp		
6	Vial 76	CLO4@ 10.ug/L	CLO4-AQN	1	Ctrl Samp		
7	Vial 77	CLO4@ 25.ug/L	CLO4-AQN	1	Ctrl Samp		
8	Vial 78	CLO4@ 50.ug/L	CLO4-AQN	1	Ctrl Samp		
9	Vial 79	CLO4@ 75.ug/L	CLO4-AQN	1	Ctrl Samp		
10	Vial 71	CLO4@ 0.2ug/L	CLO4-AQN	1	Ctrl Samp		
11	Vial 80	ICAL Verf@10ug/L	CLO4-AQN	1	Ctrl Samp		

Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI03.D

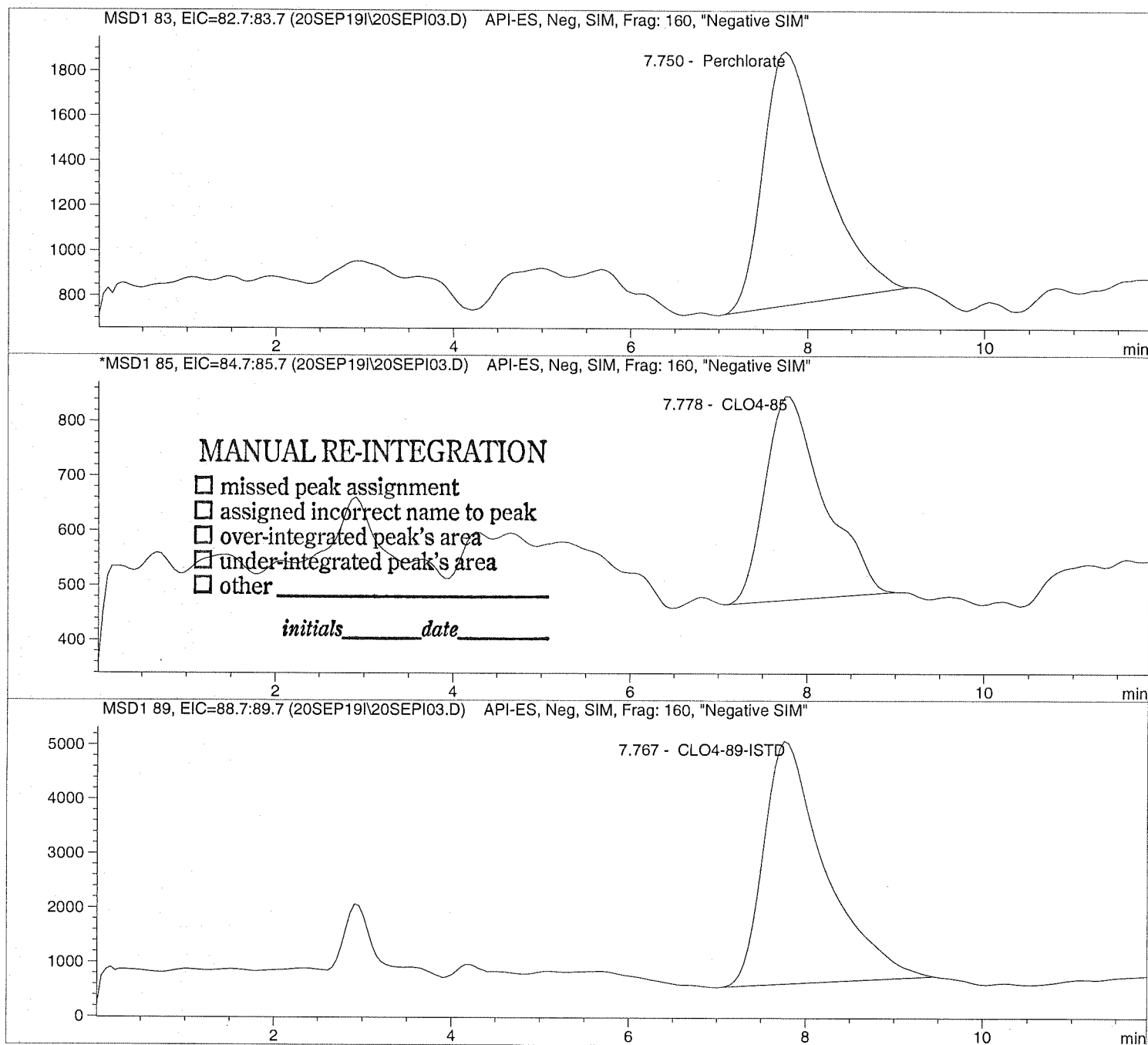
Sample Name: CLO4@ 1.0ug/L

Injection Date: 9/20/2019 09:24:05
Sample Name: CLO4@ 1.0ug/L
Acq Operator: TNB

Seq Line: 3
Location: Vial 73
Inj. No.: 1
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:21:47

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI03.D Sample Name: CLO4@ 1.0ug/L

```

=====
Injection Date: 9/20/2019 09:24:05      Seq Line:      3
Sample Name:   CLO4@ 1.0ug/L           Location:      Vial 73
Acq Operator:  TNB                     Inj. No.:     1
                                           Inj. Vol.:    30 µl
=====

```

```

Acq. Method:   CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:  9/23/2019 12:21:47
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  1.000
=====

```

```

=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.750	PBA	53921.8	0.8760	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.778	MM	17043.6	0.8245	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.767	PBA	214568.1	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI04.D

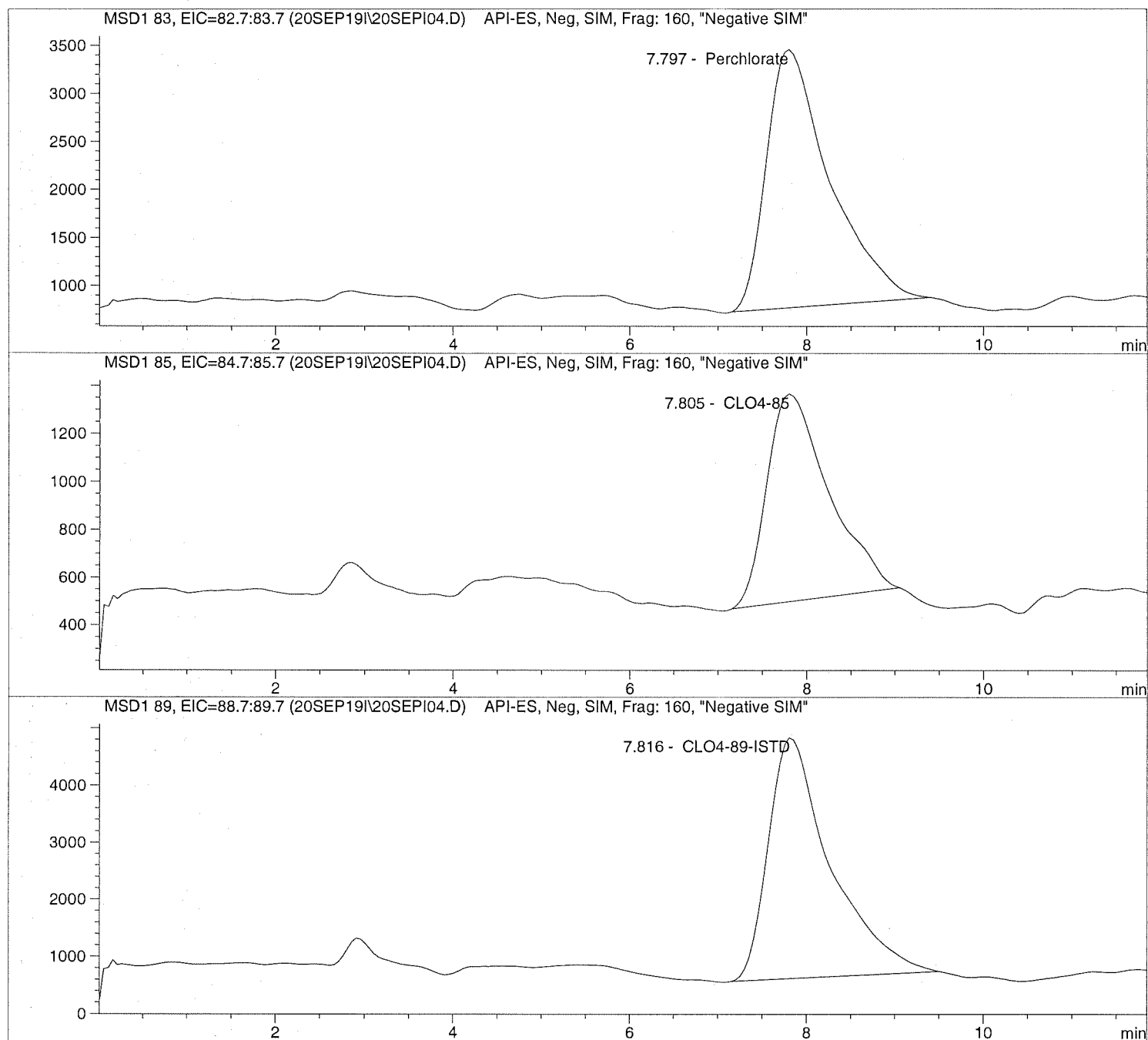
Sample Name: CLO4@ 2.0ug/L

Injection Date: 9/20/2019 09:37:58
Sample Name: CLO4@ 2.0ug/L
Acq Operator: TNB

Seq Line: 4
Location: Vial 74
Inj. No.: 1
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:21:47

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI04.D Sample Name: CLO4@ 2.0ug/L

```

=====
Injection Date: 9/20/2019 09:37:58      Seq Line:          4
Sample Name:    CLO4@ 2.0ug/L           Location:          Vial 74
Acq Operator:   TNB                     Inj. No.:         1
                                           Inj. Vol.:        30 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   9/23/2019 12:21:47
=====

```

Perchlorate analysis

Sample Information

```

=====
Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  2.000
=====

```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.797	PBA	132825.2	2.3768	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.805	PBA	42075.4	2.3809	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.816	PBA	204758.3	5.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI05.D

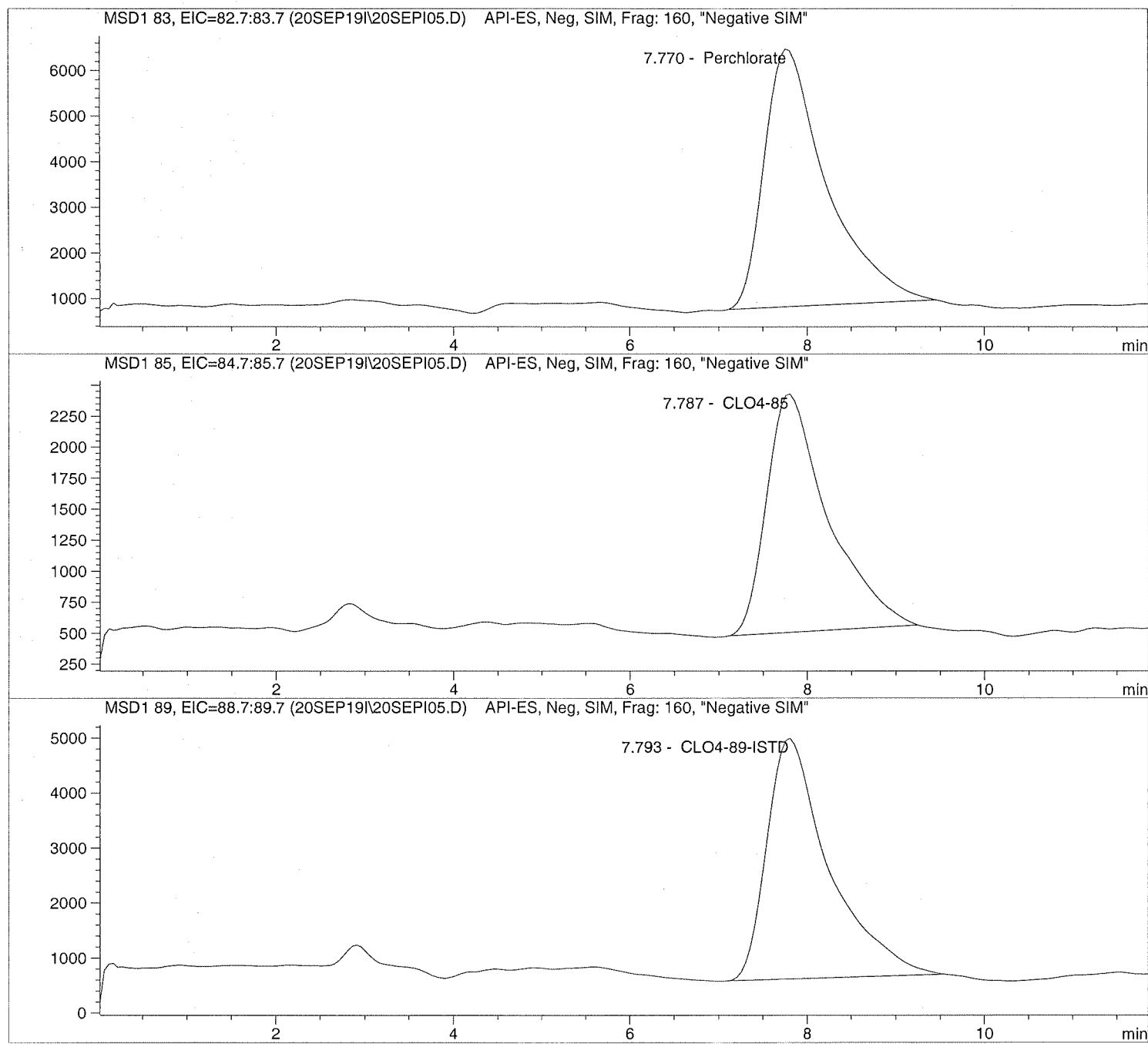
Sample Name: CLO4@ 5.0ug/L

Injection Date: 9/20/2019 09:51:49
Sample Name: CLO4@ 5.0ug/L
Acq Operator: TNB

Seq Line: 5
Location: Vial 75
Inj. No.: 1
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:21:47

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI05.D Sample Name: CLO4@ 5.0ug/L

```
=====
Injection Date:   9/20/2019  09:51:49           Seq Line:           5
Sample Name:     CLO4@ 5.0ug/L           Location:           Vial 75
Acq Operator:    TNB                     Inj. No.:           1
                                           Inj. Vol.:          30 µl
=====
```

```
Acq. Method:     CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:    9/23/2019  12:21:47
=====
```

Perchlorate analysis

Sample Information

```
=====
Sorted By:       Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:      1.000000
Dilution:        1.000000
Sample Amount:   5.000
=====
```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.770	PBA	276270.7	4.7724	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.787	PBA	92470.7	5.1417	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.793	PBA	213407.0	5.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\20SEP19\20SEPI06.D

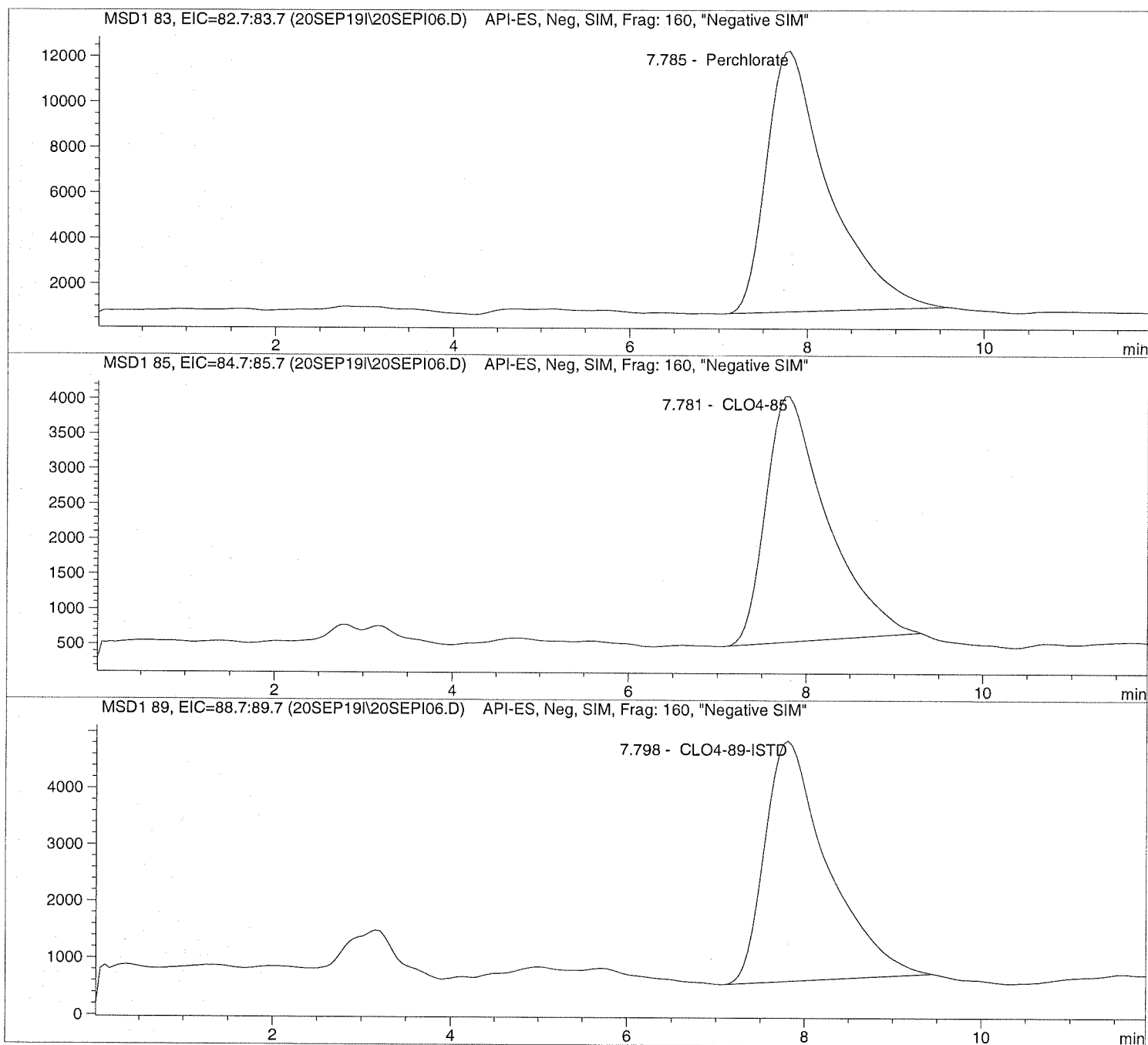
Sample Name: CLO4@ 10.ug/L

Injection Date: 9/20/2019 10:05:36
Sample Name: CLO4@ 10.ug/L
Acq Operator: TNB

Seq Line: 6
Location: Vial 76
Inj. No.: 1
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:21:47

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI06.D Sample Name: CLO4@ 10.ug/L

```

=====
Injection Date: 9/20/2019 10:05:36      Seq Line:          6
Sample Name:    CLO4@ 10.ug/L           Location:          Vial 76
Acq Operator:   TNB                     Inj. No.:         1
                                           Inj. Vol.:        30 µl
  
```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   9/23/2019 12:21:47
  
```

Perchlorate analysis

Sample Information

```

=====
Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  10.000
  
```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.785	PBA	561297.7	9.7510	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.781	PBA	168622.4	9.5221	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.798	PBA	209246.3	5.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\20SEP19\20SEPI07.D

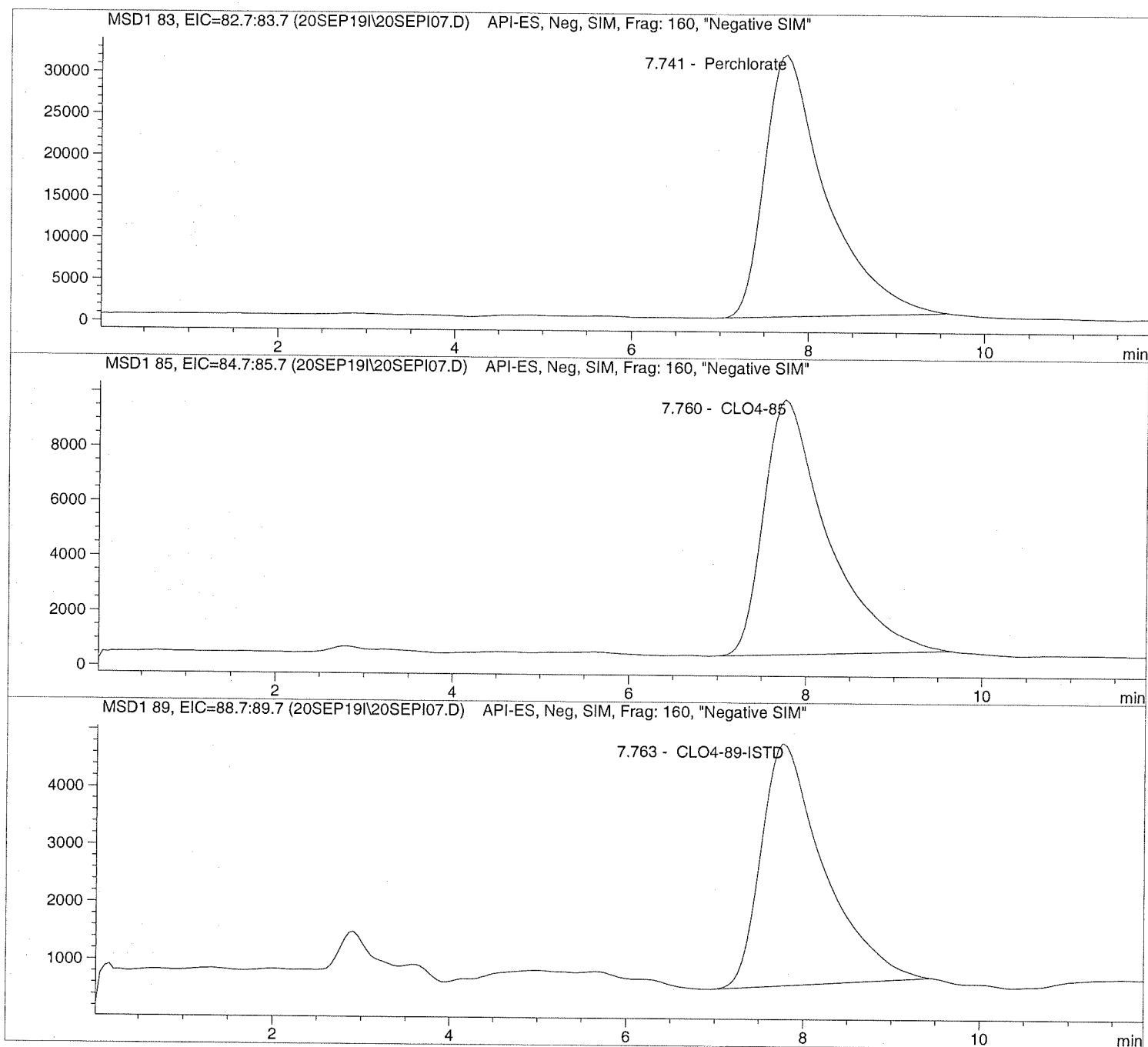
Sample Name: CLO4@ 25.ug/L

=====
Injection Date: 9/20/2019 10:19:23
Sample Name: CLO4@ 25.ug/L
Acq Operator: TNB

Seq Line: 7
Location: Vial 77
Inj. No.: 1
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:21:47

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI07.D Sample Name: CLO4@ 25.ug/L

```
=====
Injection Date: 9/20/2019 10:19:23      Seq Line:          7
Sample Name:    CLO4@ 25.ug/L           Location:          Vial 77
Acq Operator:   TNB                     Inj. No.:         1
                                           Inj. Vol.:        30 µl
=====
```

```
Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   9/23/2019 12:21:47
=====
```

Perchlorate analysis

Sample Information

```
Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  25.000
=====
```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.741	PBA	1518197.9	25.0108	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.760	PBA	463724.0	25.0492	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.763	PBA	207402.8	5.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\20SEP19\20SEPI08.D

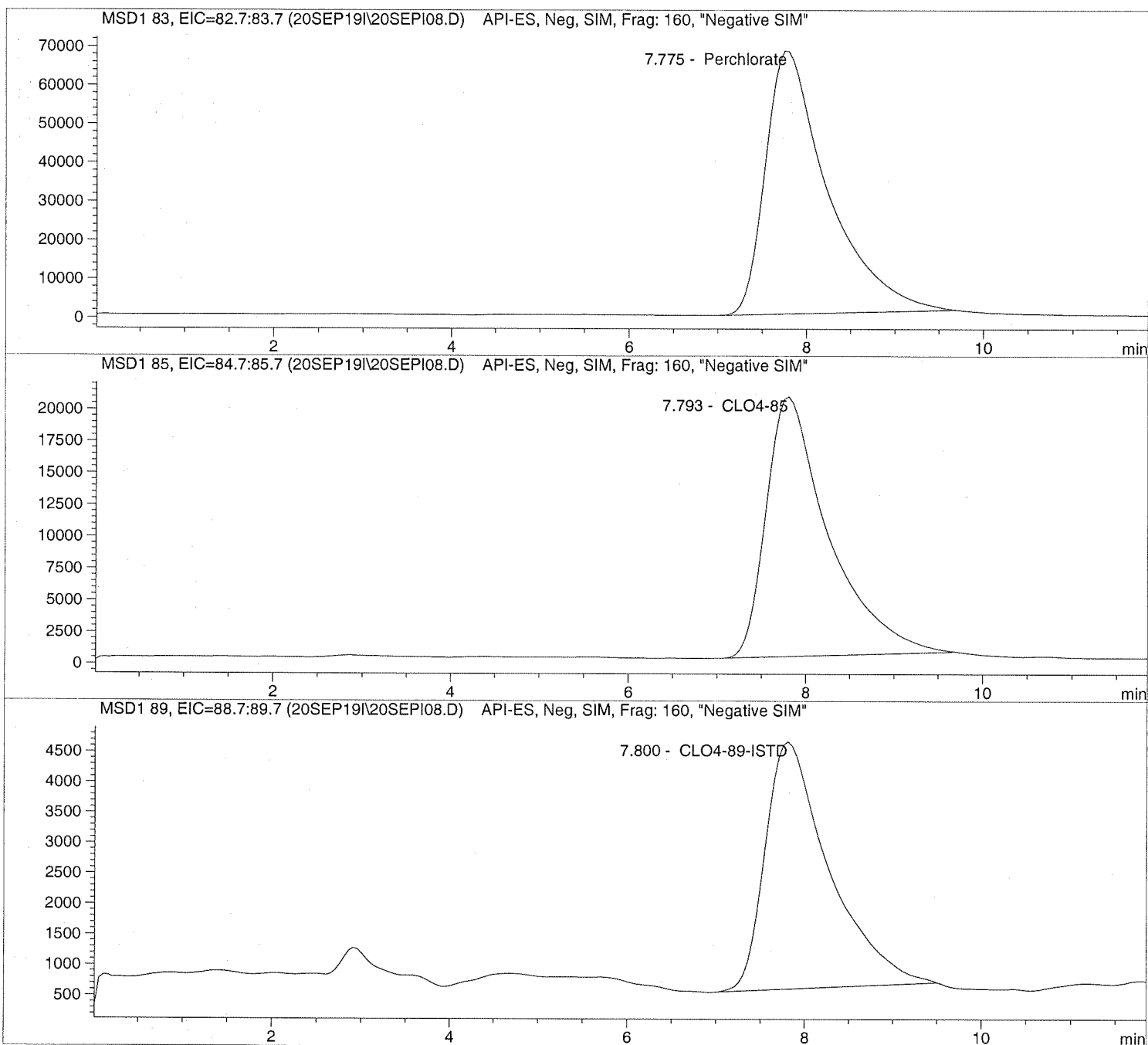
Sample Name: CLO4@ 50.ug/L

Injection Date: 9/20/2019 10:33:18
Sample Name: CLO4@ 50.ug/L
Acq Operator: TNB

Seq Line: 8
Location: Vial 78
Inj. No.: 1
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:21:47

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI08.D Sample Name: CLO4@ 50.ug/L

```

=====
Injection Date: 9/20/2019 10:33:18      Seq Line:      8
Sample Name:    CLO4@ 50.ug/L           Location:      Vial 78
Acq Operator:   TNB                     Inj. No.:     1
                                           Inj. Vol.:    30 µl

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   9/23/2019 12:21:47

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  50.000

```

```

=====
                          LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.775	PBA	3311559.2	50.4030	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.793	PBA	995933.0	50.1422	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.800	PBA	202929.2	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***

```

Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI09.D

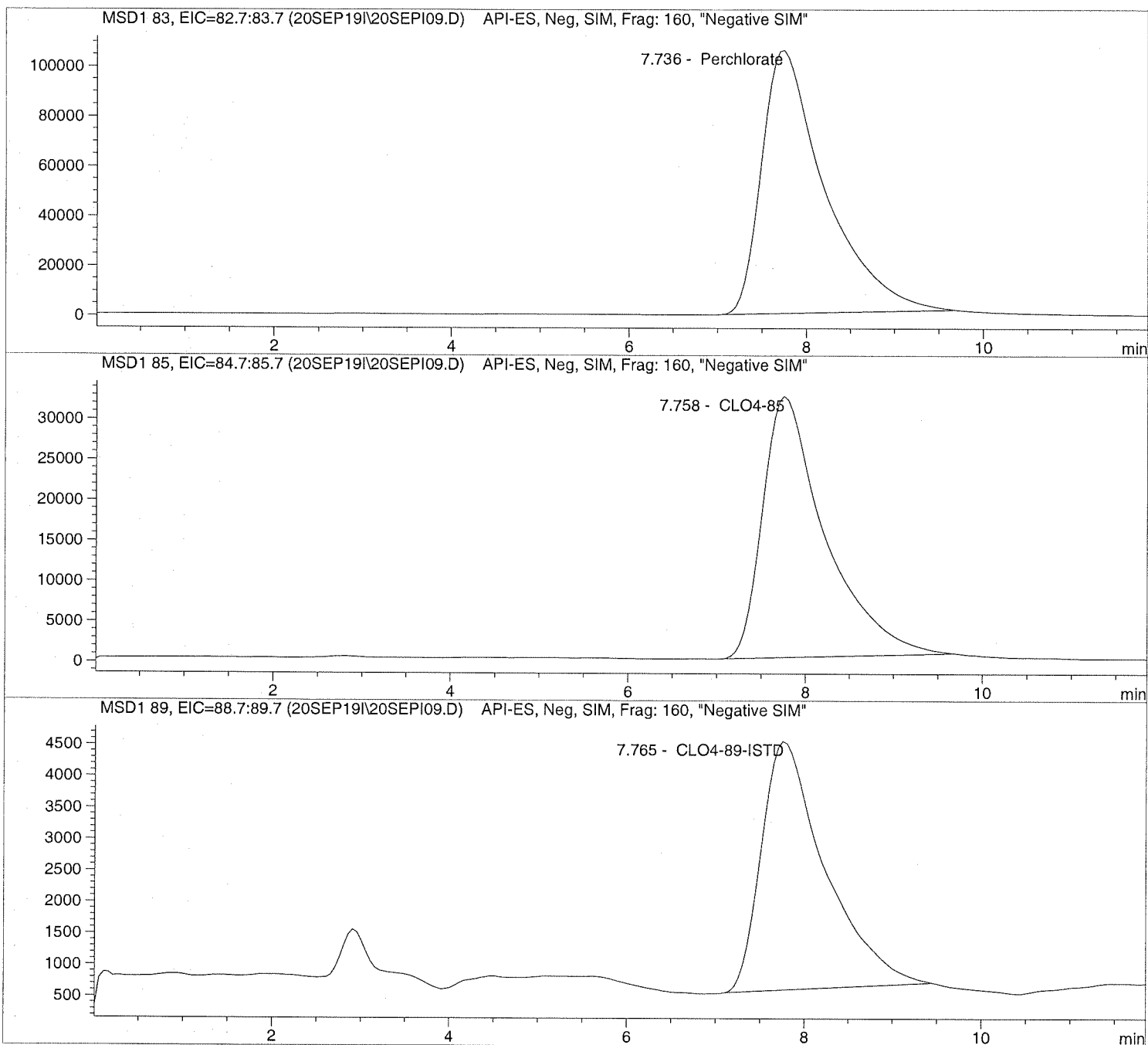
Sample Name: CLO4@ 75.ug/L

=====
Injection Date: 9/20/2019 10:47:05
Sample Name: CLO4@ 75.ug/L
Acq Operator: TNB

Seq Line: 9
Location: Vial 79
Inj. No.: 1
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:21:47

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI09.D Sample Name: CLO4@ 75.ug/L

```

=====
Injection Date: 9/20/2019 10:47:05      Seq Line:            9
Sample Name:    CLO4@ 75.ug/L            Location:            Vial 79
Acq Operator:   TNB                    Inj. No.:            1
                                         Inj. Vol.:            30 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   9/23/2019 12:21:47
=====

```

Perchlorate analysis

Sample Information

```

=====
Sorted By:            Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:          1.000000
Dilution:            1.000000
Sample Amount:        75.000
=====

```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.736	PBA	5239145.0	74.7911	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.758	PBA	1580664.2	74.9366	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.765	PBA	197932.5	5.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\20SEP19\20SEPI11.D

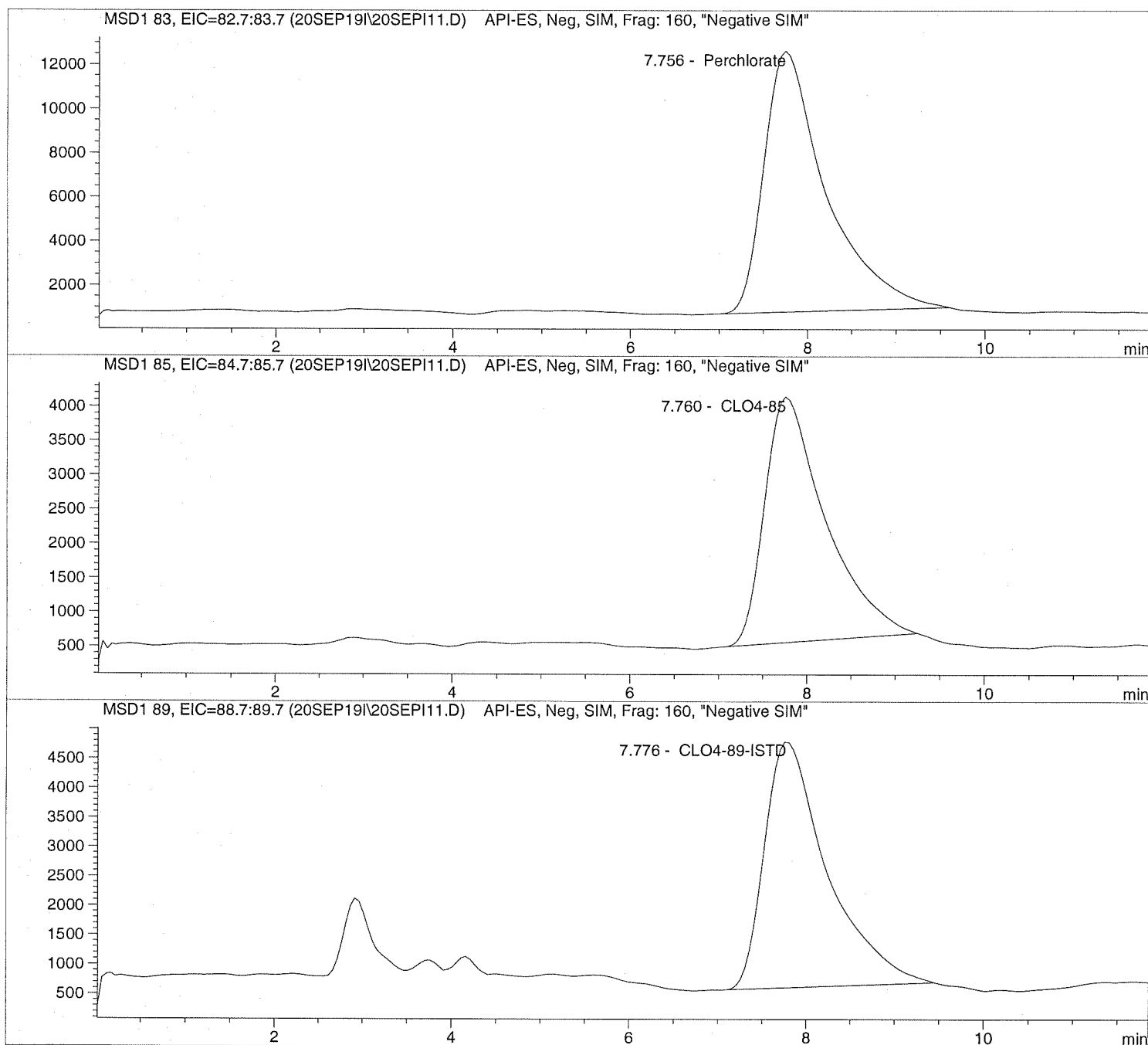
Sample Name: ICAL Verf@10ug/L

=====
Injection Date: 9/20/2019 11:14:45
Sample Name: ICAL Verf@10ug/L
Acq Operator: TNB

Seq Line: 11
Location: Vial 80
Inj. No.: 1
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:21:47

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI11.D Sample Name: ICAL Verf@10ug/L

```
=====
Injection Date: 9/20/2019 11:14:45      Seq Line:            11
Sample Name:    ICAL Verf@10ug/L        Location:            Vial 80
Acq Operator:   TNB                      Inj. No.:            1
                                         Inj. Vol.:            30 µl
=====
```

```
Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   9/23/2019 12:21:47
```

Perchlorate analysis

=====

Sample Information

=====

```
Sorted By:            Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:          1.000000
Dilution:            1.000000
Sample Amount:        10.000
```

=====

LCMS Results

=====

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.756	PBA	574879.4	10.1185	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.760	PBA	171000.4	9.7904	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.776	PBA	206243.3	5.0000	CLO4-89-ISTD

=====

*** End of Report ***



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Unmodified

Data file: C:\HPCHEM\1\DATA\20SEP19\20SEPI03.D

Sample Name: CLO4@ 1.0ug/L

Injection Date: 9/20/2019 09:24:05

Seq Line: 3

Sample Name: CLO4@ 1.0ug/L

Location: Vial 73

Acq Operator: TNB

Inj. No.: 1

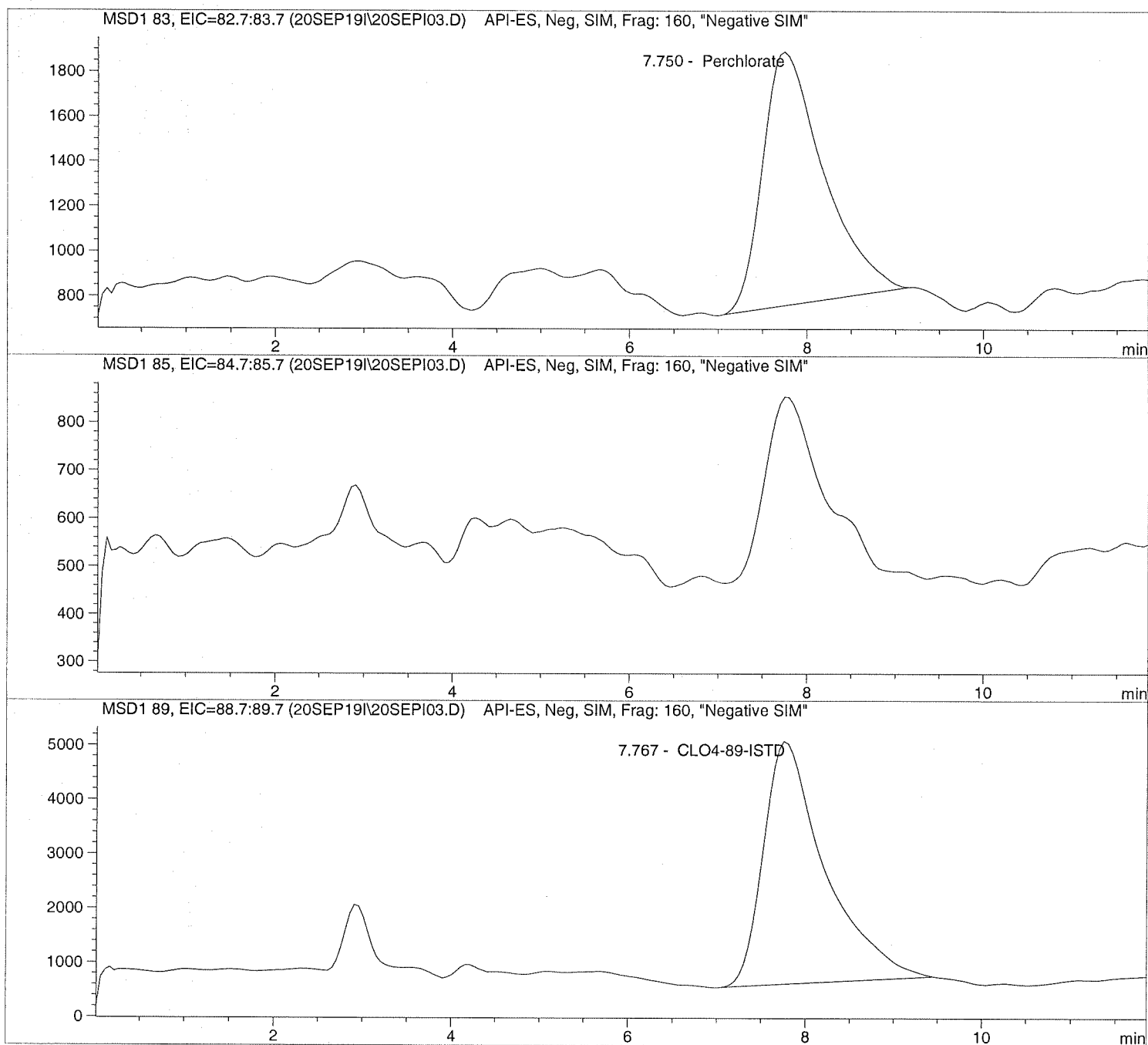
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M

Last Changed: 9/23/2019 12:27:11

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI03.D

Sample Name: CLO4@ 1.0ug/L

```

=====
Injection Date: 9/20/2019 09:24:05      Seq Line:          3
Sample Name:    CLO4@ 1.0ug/L           Location:          Vial 73
Acq Operator:   TNB                     Inj. No.:         1
                                           Inj. Vol.:        30 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   9/23/2019 12:27:11
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  1.000
=====

```

```

=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.750	PBA	53921.8	0.8760	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.767	PBA	214568.1	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\20DEC19D\20DEC14.D

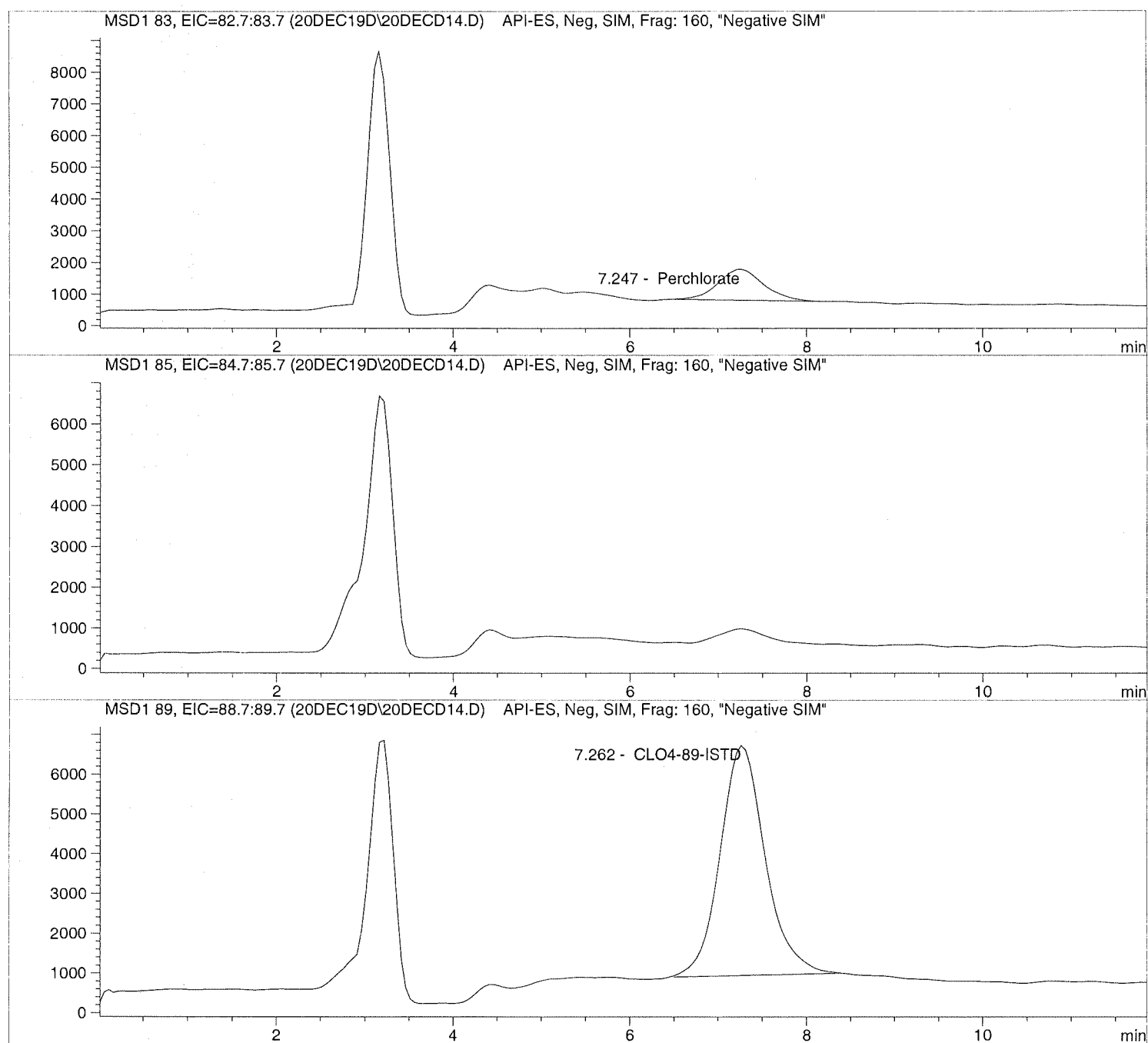
Sample Name: 1935316001

=====
Injection Date: 12/20/2019 16:20:57
Sample Name: 1935316001
Acq Operator: TNB

Seq Line: 14
Location: Vial 84
Inj. No.: 1
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20DEC19D\20DECD14.D Sample Name: 1935316001

```

=====
Injection Date: 12/20/2019 16:20:57      Seq Line:      14
Sample Name:   1935316001                Location:      Vial 84
Acq Operator:  TNB                       Inj. No.:     1
                                           Inj. Vol.:    35 µl

```

```

Acq. Method:   CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:  11/5/2019 08:44:45

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  0.000

```

```

=====
                          LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.247	PBA	35246.8	0.5749	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.262	BBA	204617.7	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***

```

Data file: C:\HPCHEM\1\DATA\20DEC19D\20DECD16.D

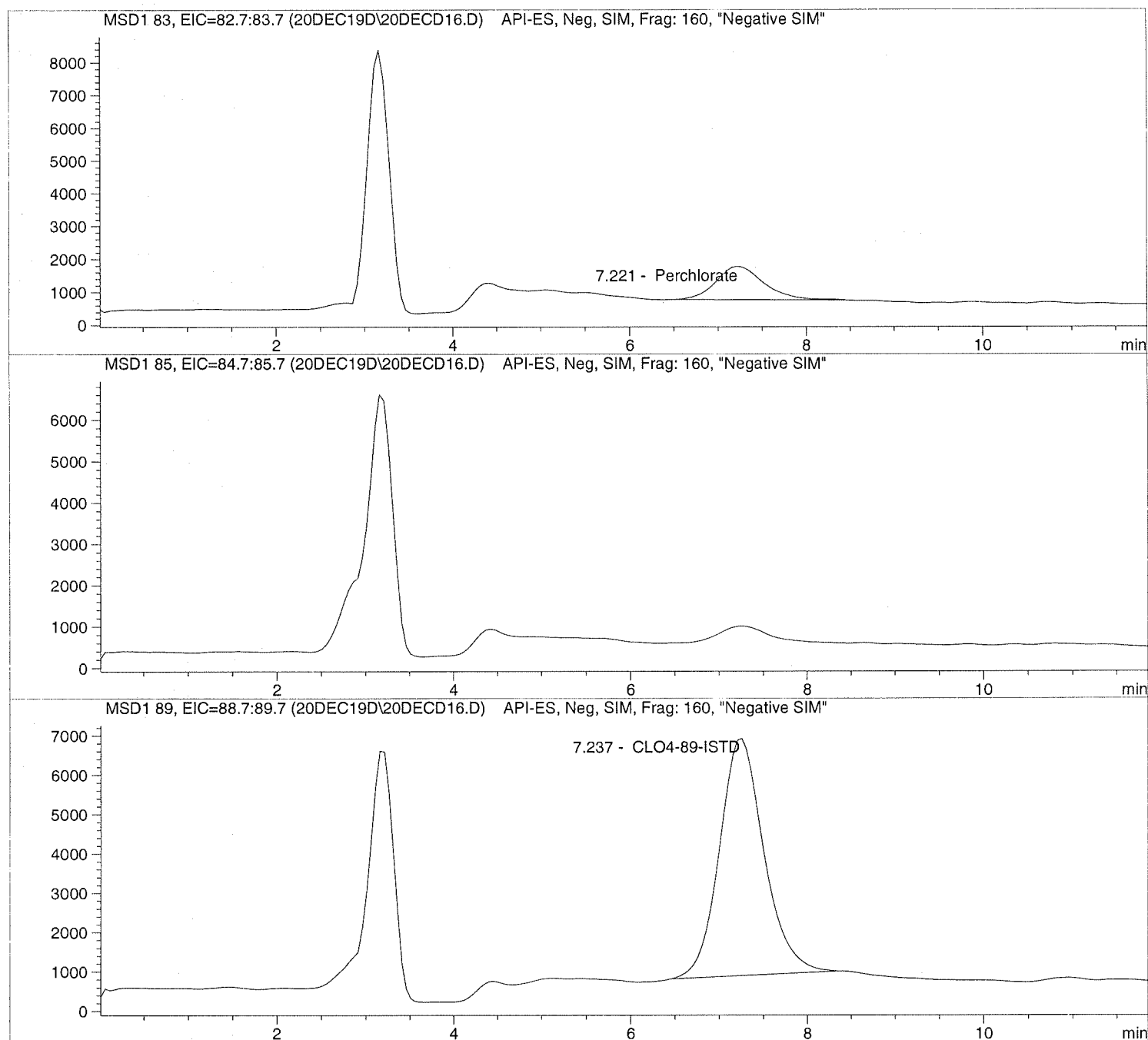
Sample Name: 1935316002

Injection Date: 12/20/2019 16:48:43
Sample Name: 1935316002
Acq Operator: TNB

Seq Line: 16
Location: Vial 85
Inj. No.: 1
Inj. Vol.: 35 μ l

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20DEC19D\20DEC16.D Sample Name: 1935316002

```

=====
Injection Date: 12/20/2019 16:48:43      Seq Line:          16
Sample Name:    1935316002                Location:          Vial 85
Acq Operator:   TNB                       Inj. No.:         1
                                           Inj. Vol.:       35 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  0.000
=====

```

```

=====
                          LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.221	PBA	37711.6	0.6019	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.237	PBA	210291.4	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\20DEC19D\20DECD18.D

Sample Name: 1935316004

Injection Date: 12/20/2019 17:16:32

Seq Line: 18

Sample Name: 1935316004

Location: Vial 87

Acq Operator: TNB

Inj. No.: 1

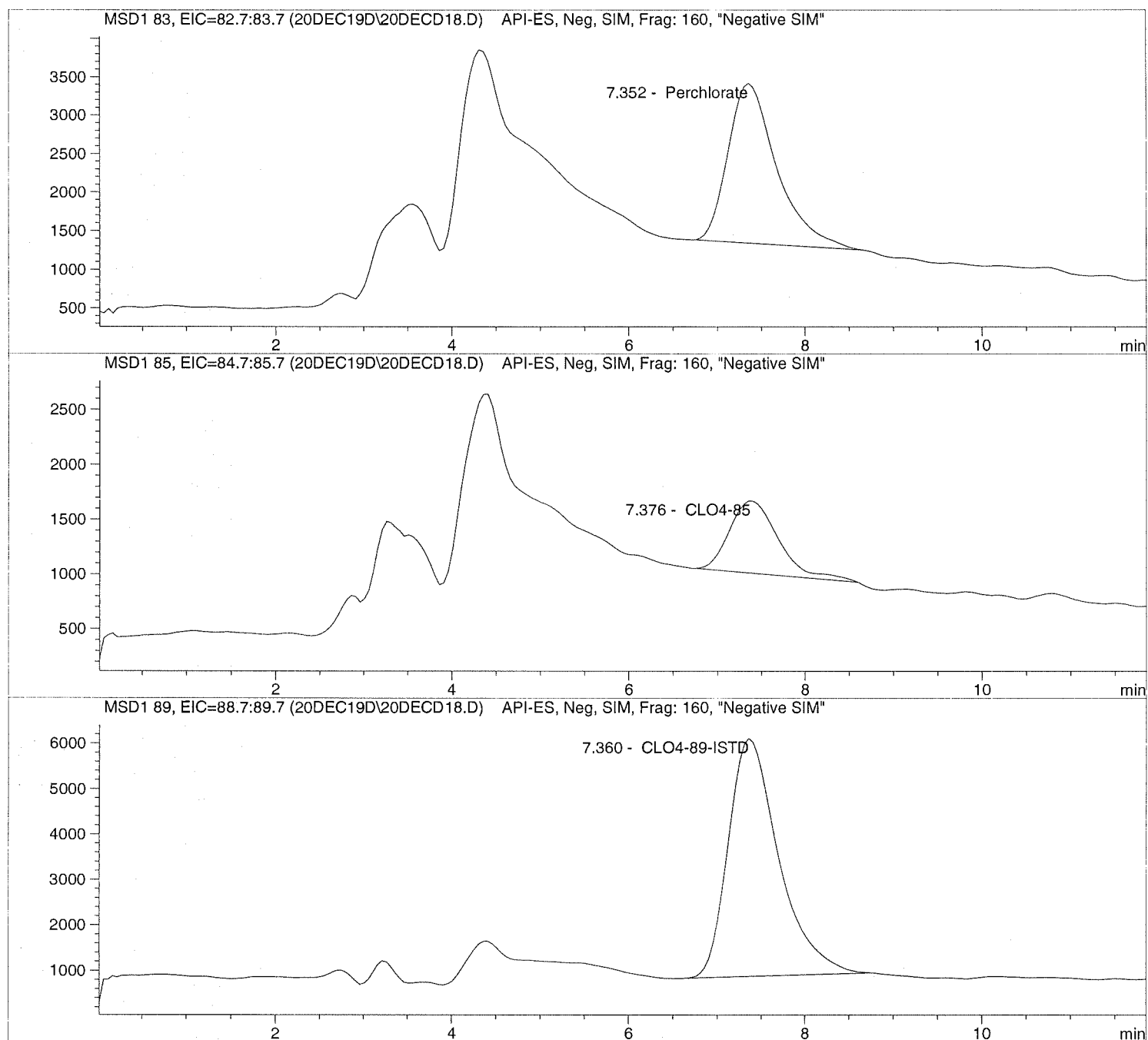
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M

Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20DEC19D\20DEC18.D Sample Name: 1935316004

```

=====
Injection Date: 12/20/2019 17:16:32      Seq Line:          18
Sample Name:   1935316004                Location:          Vial 87
Acq Operator:  TNB                       Inj. No.:         1
                                           Inj. Vol.:       35 µl
=====

```

```

Acq. Method:   CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:  11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:    1.000000
Dilution:      1.000000
Sample Amount: 0.000
=====

```

```

=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.352	PBA	79516.8	1.3684	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.376	PBA	25544.4	1.3576	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.360	PBA	208671.3	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\20DEC19D\20DEC19.D

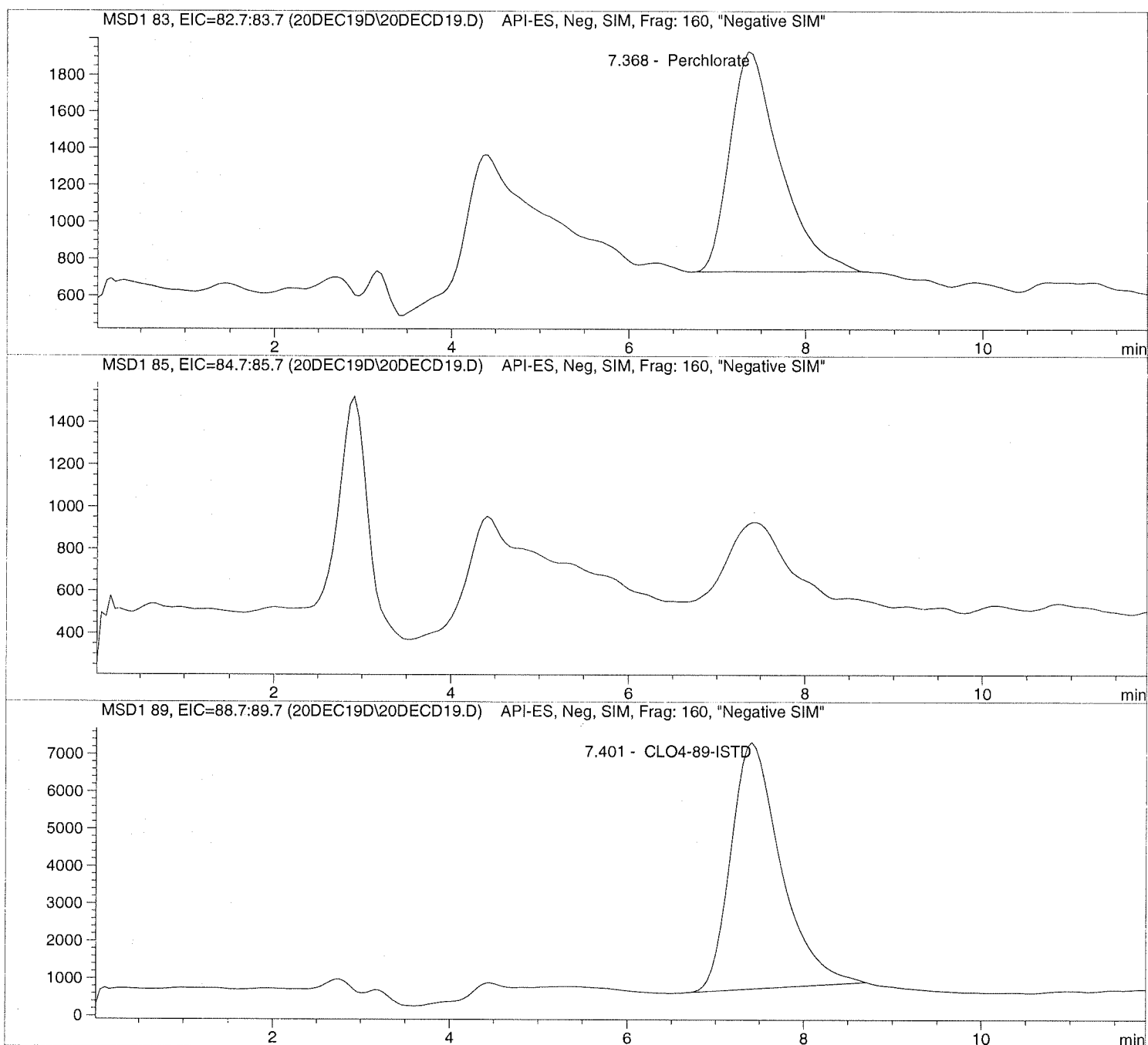
Sample Name: 1935343001

=====
Injection Date: 12/20/2019 17:30:23
Sample Name: 1935343001
Acq Operator: TNB

Seq Line: 19
Location: Vial 88
Inj. No.: 1
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20DEC19D\20DEC19.D Sample Name: 1935343001

```

=====
Injection Date: 12/20/2019 17:30:23      Seq Line:          19
Sample Name:   1935343001                Location:          Vial 88
Acq Operator:  TNB                       Inj. No.:         1
                                           Inj. Vol.:        35 µl
=====

```

```

Acq. Method:   CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:  11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:          Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:         1.000000
Dilution:           1.000000
Sample Amount:      0.000
=====

```

```

=====
                          LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.368	PBA	47484.7	0.6123	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.401	PBA	260797.0	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```



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

December 31, 2019

Marcia Olive
Bhate Environmental Associates, Inc.
445 Union Blvd Ste 129
Lakewood, CO 80228

Work Order: **HS19120844**

Laboratory Results for: **LHAAP/Site 18/24**

Dear Marcia,

ALS Environmental received 5 sample(s) on Dec 14, 2019 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: DAYNA.FISHER
RJ Modashia
Project Manager

ALS Houston, US

Date: 31-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP/Site 18/24
Work Order: HS19120844

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19120844-01	MW2_121319	Groundwater		13-Dec-2019 08:10	14-Dec-2019 09:30	<input type="checkbox"/>
HS19120844-02	MW2_121319_a	Groundwater		13-Dec-2019 08:10	14-Dec-2019 09:30	<input type="checkbox"/>
HS19120844-03	18CpTMW01SW_121319	Groundwater		13-Dec-2019 09:35	14-Dec-2019 09:30	<input type="checkbox"/>
HS19120844-04	AWD1_121319	Groundwater		13-Dec-2019 10:50	14-Dec-2019 09:30	<input type="checkbox"/>
HS19120844-05	Trip Blank	Water		13-Dec-2019 08:10	14-Dec-2019 09:30	<input type="checkbox"/>

ALS Houston, US

Date: 31-Dec-19

Client: Bhate Environmental Associates, Inc.**CASE NARRATIVE****Project:** LHAAP/Site 18/24**Work Order:** HS19120844

Work Order Comments

- The analysis for Perchlorate was subcontracted to ALS Environmental in Salt Lake City, Utah. Final report attached.

GCMS Semivolatiles by Method SW8270SIM**Batch ID: 148814**

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

GCMS Volatiles by Method SW8260**Batch ID: R352800****Sample ID: CCV**

- Carbon Disulfide and 1,2,3-Trichlorobenzene exceeded %D limits for CCV. Sample are ND for these compounds.

Sample ID: VLCSW-191218

- 1,2,3-Trichlorobenzene is also high for LCS.

Sample ID: HS19120843-04MS

- MS and MSD are for an unrelated sample

Metals by Method SW6020**Batch ID: 149105****Sample ID: HS19120702-03MS**

- MS/MSD and DUPs are for an unrelated sample

Metals by Method SW7470**Batch ID: 149099**

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

ALS Houston, US

Date: 31-Dec-19

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP/Site 18/24
 Sample ID: MW2_121319
 Collection Date: 13-Dec-2019 08:10

ANALYTICAL REPORT
 WorkOrder:HS19120844
 Lab ID:HS19120844-01
 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	25	U	15	25	50	UG/L	50	18-Dec-2019 16:36	
1,1,1-Trichloroethane	25	U	10	25	50	UG/L	50	18-Dec-2019 16:36	
1,1,2,2-Tetrachloroethane	25	U	25	25	50	UG/L	50	18-Dec-2019 16:36	
1,1,2-Trichloroethane	25	U	15	25	50	UG/L	50	18-Dec-2019 16:36	
1,1-Dichloroethane	21	J	10	25	50	UG/L	50	18-Dec-2019 16:36	
1,1-Dichloroethene	83		10	25	50	UG/L	50	18-Dec-2019 16:36	
1,1-Dichloropropene	25	U	15	25	50	UG/L	50	18-Dec-2019 16:36	
1,2,3-Trichlorobenzene	25	U	20	25	50	UG/L	50	18-Dec-2019 16:36	
1,2,3-Trichloropropane	25	U	25	25	50	UG/L	50	18-Dec-2019 16:36	
1,2,4-Trichlorobenzene	25	U	25	25	50	UG/L	50	18-Dec-2019 16:36	
1,2,4-Trimethylbenzene	25	U	15	25	50	UG/L	50	18-Dec-2019 16:36	
1,2-Dibromo-3-chloropropane	25	U	10	25	50	UG/L	50	18-Dec-2019 16:36	
1,2-Dibromoethane	25	U	10	25	50	UG/L	50	18-Dec-2019 16:36	
1,2-Dichlorobenzene	25	U	25	25	50	UG/L	50	18-Dec-2019 16:36	
1,2-Dichloroethane	25	U	10	25	50	UG/L	50	18-Dec-2019 16:36	
1,2-Dichloropropane	25	U	25	25	50	UG/L	50	18-Dec-2019 16:36	
1,3,5-Trimethylbenzene	25	U	15	25	50	UG/L	50	18-Dec-2019 16:36	
1,3-Dichlorobenzene	25	U	20	25	50	UG/L	50	18-Dec-2019 16:36	
1,3-Dichloropropane	25	U	15	25	50	UG/L	50	18-Dec-2019 16:36	
1,4-Dichlorobenzene	25	U	20	25	50	UG/L	50	18-Dec-2019 16:36	
2,2-Dichloropropane	25	U	10	25	50	UG/L	50	18-Dec-2019 16:36	
2-Butanone	50	U	25	50	100	UG/L	50	18-Dec-2019 16:36	
2-Chlorotoluene	25	U	15	25	50	UG/L	50	18-Dec-2019 16:36	
2-Hexanone	50	U	50	50	100	UG/L	50	18-Dec-2019 16:36	
4-Chlorotoluene	25	U	20	25	50	UG/L	50	18-Dec-2019 16:36	
4-Isopropyltoluene	25	U	15	25	50	UG/L	50	18-Dec-2019 16:36	
4-Methyl-2-pentanone	50	U	35	50	100	UG/L	50	18-Dec-2019 16:36	
Acetone	50	U	20	50	100	UG/L	50	18-Dec-2019 16:36	
Benzene	25	U	10	25	50	UG/L	50	18-Dec-2019 16:36	
Bromobenzene	25	U	20	25	50	UG/L	50	18-Dec-2019 16:36	
Bromochloromethane	72		10	25	50	UG/L	50	18-Dec-2019 16:36	
Bromodichloromethane	25	U	10	25	50	UG/L	50	18-Dec-2019 16:36	
Bromoform	25	U	20	25	50	UG/L	50	18-Dec-2019 16:36	
Bromomethane	25	U	20	25	50	UG/L	50	18-Dec-2019 16:36	
Carbon disulfide	50	U	30	50	100	UG/L	50	18-Dec-2019 16:36	
Carbon tetrachloride	25	U	25	25	50	UG/L	50	18-Dec-2019 16:36	
Chlorobenzene	25	U	15	25	50	UG/L	50	18-Dec-2019 16:36	
Chloroethane	25	U	15	25	50	UG/L	50	18-Dec-2019 16:36	
Chloroform	30	J	10	25	50	UG/L	50	18-Dec-2019 16:36	

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

ALS Houston, US

Date: 31-Dec-19

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP/Site 18/24
 Sample ID: MW2_121319
 Collection Date: 13-Dec-2019 08:10

ANALYTICAL REPORT

WorkOrder:HS19120844
 Lab ID:HS19120844-01
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED	
VOLATILES ORGANICS BY METHOD 8260C		Method:SW8260						Analyst: PC	
Chloromethane	25	U	10	25	50	UG/L	50	18-Dec-2019 16:36	
cis-1,2-Dichloroethene	21,000		100	250	500	UG/L	500	18-Dec-2019 17:00	
cis-1,3-Dichloropropene	25	U	5.0	25	50	UG/L	50	18-Dec-2019 16:36	
Dibromochloromethane	25	U	15	25	50	UG/L	50	18-Dec-2019 16:36	
Dibromomethane	25	U	10	25	50	UG/L	50	18-Dec-2019 16:36	
Dichlorodifluoromethane	25	U	15	25	50	UG/L	50	18-Dec-2019 16:36	
Ethylbenzene	25	U	15	25	50	UG/L	50	18-Dec-2019 16:36	
Hexachlorobutadiene	25	U	50	25	50	UG/L	50	18-Dec-2019 16:36	
Isopropylbenzene	25	U	15	25	50	UG/L	50	18-Dec-2019 16:36	
m,p-Xylene	50	U	25	50	100	UG/L	50	18-Dec-2019 16:36	
Methylene chloride	42,000		200	500	1000	UG/L	500	18-Dec-2019 17:00	
n-Butylbenzene	25	U	20	25	50	UG/L	50	18-Dec-2019 16:36	
n-Propylbenzene	25	U	15	25	50	UG/L	50	18-Dec-2019 16:36	
Naphthalene	25	U	15	25	50	UG/L	50	18-Dec-2019 16:36	
o-Xylene	25	U	15	25	50	UG/L	50	18-Dec-2019 16:36	
sec-Butylbenzene	25	U	15	25	50	UG/L	50	18-Dec-2019 16:36	
Styrene	25	U	15	25	50	UG/L	50	18-Dec-2019 16:36	
tert-Butylbenzene	25	U	15	25	50	UG/L	50	18-Dec-2019 16:36	
Tetrachloroethene	25	U	15	25	50	UG/L	50	18-Dec-2019 16:36	
Toluene	25	U	10	25	50	UG/L	50	18-Dec-2019 16:36	
trans-1,2-Dichloroethene	34	J	10	25	50	UG/L	50	18-Dec-2019 16:36	
trans-1,3-Dichloropropene	25	U	10	25	50	UG/L	50	18-Dec-2019 16:36	
Trichloroethene	4,800		10	25	50	UG/L	50	18-Dec-2019 16:36	
Trichlorofluoromethane	25	U	15	25	50	UG/L	50	18-Dec-2019 16:36	
Vinyl chloride	25	U	10	25	50	UG/L	50	18-Dec-2019 16:36	
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>92.6</i>			0	<i>81-118</i>	%REC	50	18-Dec-2019 16:36	
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>92.3</i>			0	<i>81-118</i>	%REC	500	18-Dec-2019 17:00	
<i>Surr: 4-Bromofluorobenzene</i>	<i>100</i>			0	<i>85-114</i>	%REC	50	18-Dec-2019 16:36	
<i>Surr: 4-Bromofluorobenzene</i>	<i>98.8</i>			0	<i>85-114</i>	%REC	500	18-Dec-2019 17:00	
<i>Surr: Dibromofluoromethane</i>	<i>92.8</i>			0	<i>80-119</i>	%REC	50	18-Dec-2019 16:36	
<i>Surr: Dibromofluoromethane</i>	<i>92.9</i>			0	<i>80-119</i>	%REC	500	18-Dec-2019 17:00	
<i>Surr: Toluene-d8</i>	<i>101</i>			0	<i>89-112</i>	%REC	50	18-Dec-2019 16:36	
<i>Surr: Toluene-d8</i>	<i>101</i>			0	<i>89-112</i>	%REC	500	18-Dec-2019 17:00	
SEMIVOLATILES SIM		Method:SW8270SIM						Prep:SW3510 / 17-Dec-2019 Analyst: LG	
1,4-Dioxane	5.7		0.20	0.20	0.20	ug/L	20	23-Dec-2019 16:41	
<i>Surr: 2-Fluorobiphenyl</i>	<i>97.2</i>			0	<i>40-140</i>	%REC	20	23-Dec-2019 16:41	
<i>Surr: 4-Terphenyl-d14</i>	<i>126</i>			0	<i>40-140</i>	%REC	20	23-Dec-2019 16:41	
<i>Surr: Nitrobenzene-d5</i>	<i>87.4</i>			0	<i>40-140</i>	%REC	20	23-Dec-2019 16:41	

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

ALS Houston, US

Date: 31-Dec-19

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP/Site 18/24
 Sample ID: MW2_121319
 Collection Date: 13-Dec-2019 08:10

ANALYTICAL REPORT

WorkOrder:HS19120844
 Lab ID:HS19120844-01
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A		Method:SW6020				Prep:SW3010A / 24-Dec-2019		Analyst: JHD
Aluminum	0.0283		0.00180	0.00500	0.0100	mg/L	1	27-Dec-2019 15:00
Antimony	0.000434	J	0.000400	0.000500	0.00500	mg/L	1	27-Dec-2019 15:00
Arsenic	0.0440		0.000400	0.000500	0.00500	mg/L	1	27-Dec-2019 15:00
Barium	2.62		0.0380	0.0500	0.100	mg/L	20	30-Dec-2019 11:00
Beryllium	0.000362	J	0.000200	0.000500	0.00200	mg/L	1	27-Dec-2019 15:00
Cadmium	0.000329	J	0.000200	0.000500	0.00200	mg/L	1	27-Dec-2019 15:00
Calcium	80.5		0.0340	0.0500	0.500	mg/L	1	27-Dec-2019 15:00
Chromium	0.0216		0.000400	0.000500	0.00500	mg/L	1	27-Dec-2019 15:00
Cobalt	0.109		0.000100	0.000500	0.00500	mg/L	1	27-Dec-2019 15:00
Copper	0.00306	J	0.00100	0.00250	0.00500	mg/L	1	27-Dec-2019 15:00
Iron	36.4		0.0120	0.0500	0.200	mg/L	1	27-Dec-2019 15:00
Lead	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	27-Dec-2019 15:00
Magnesium	59.0		0.0100	0.0500	0.200	mg/L	1	27-Dec-2019 15:00
Manganese	6.09		0.0140	0.0500	0.100	mg/L	20	30-Dec-2019 11:00
Nickel	0.0628		0.000600	0.00100	0.00500	mg/L	1	27-Dec-2019 15:00
Potassium	2.96		0.0180	0.0500	0.200	mg/L	1	27-Dec-2019 15:00
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	27-Dec-2019 15:00
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	27-Dec-2019 15:00
Sodium	220		0.280	1.00	4.00	mg/L	20	30-Dec-2019 11:00
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	27-Dec-2019 15:00
Vanadium	0.00191	J	0.000600	0.00100	0.00500	mg/L	1	27-Dec-2019 15:00
Zinc	0.148		0.00200	0.00250	0.00500	mg/L	1	27-Dec-2019 15:00
MERCURY BY SW7470A		Method:SW7470				Prep:SW7470 / 24-Dec-2019		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	24-Dec-2019 17:41
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		Method:NA						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	23-Dec-2019 17:05

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

ALS Houston, US

Date: 31-Dec-19

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP/Site 18/24
 Sample ID: MW2_121319_a
 Collection Date: 13-Dec-2019 08:10

ANALYTICAL REPORT
 WorkOrder:HS19120844
 Lab ID:HS19120844-02
 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	25	U	15	25	50	UG/L	50	18-Dec-2019 17:24	
1,1,1-Trichloroethane	25	U	10	25	50	UG/L	50	18-Dec-2019 17:24	
1,1,2,2-Tetrachloroethane	25	U	25	25	50	UG/L	50	18-Dec-2019 17:24	
1,1,2-Trichloroethane	25	U	15	25	50	UG/L	50	18-Dec-2019 17:24	
1,1-Dichloroethane	25	U	10	25	50	UG/L	50	18-Dec-2019 17:24	
1,1-Dichloroethene	70		10	25	50	UG/L	50	18-Dec-2019 17:24	
1,1-Dichloropropene	25	U	15	25	50	UG/L	50	18-Dec-2019 17:24	
1,2,3-Trichlorobenzene	25	U	20	25	50	UG/L	50	18-Dec-2019 17:24	
1,2,3-Trichloropropane	25	U	25	25	50	UG/L	50	18-Dec-2019 17:24	
1,2,4-Trichlorobenzene	25	U	25	25	50	UG/L	50	18-Dec-2019 17:24	
1,2,4-Trimethylbenzene	25	U	15	25	50	UG/L	50	18-Dec-2019 17:24	
1,2-Dibromo-3-chloropropane	25	U	10	25	50	UG/L	50	18-Dec-2019 17:24	
1,2-Dibromoethane	25	U	10	25	50	UG/L	50	18-Dec-2019 17:24	
1,2-Dichlorobenzene	25	U	25	25	50	UG/L	50	18-Dec-2019 17:24	
1,2-Dichloroethane	25	U	10	25	50	UG/L	50	18-Dec-2019 17:24	
1,2-Dichloropropane	25	U	25	25	50	UG/L	50	18-Dec-2019 17:24	
1,3,5-Trimethylbenzene	25	U	15	25	50	UG/L	50	18-Dec-2019 17:24	
1,3-Dichlorobenzene	25	U	20	25	50	UG/L	50	18-Dec-2019 17:24	
1,3-Dichloropropane	25	U	15	25	50	UG/L	50	18-Dec-2019 17:24	
1,4-Dichlorobenzene	25	U	20	25	50	UG/L	50	18-Dec-2019 17:24	
2,2-Dichloropropane	25	U	10	25	50	UG/L	50	18-Dec-2019 17:24	
2-Butanone	50	U	25	50	100	UG/L	50	18-Dec-2019 17:24	
2-Chlorotoluene	25	U	15	25	50	UG/L	50	18-Dec-2019 17:24	
2-Hexanone	50	U	50	50	100	UG/L	50	18-Dec-2019 17:24	
4-Chlorotoluene	25	U	20	25	50	UG/L	50	18-Dec-2019 17:24	
4-Isopropyltoluene	25	U	15	25	50	UG/L	50	18-Dec-2019 17:24	
4-Methyl-2-pentanone	50	U	35	50	100	UG/L	50	18-Dec-2019 17:24	
Acetone	50	U	20	50	100	UG/L	50	18-Dec-2019 17:24	
Benzene	25	U	10	25	50	UG/L	50	18-Dec-2019 17:24	
Bromobenzene	25	U	20	25	50	UG/L	50	18-Dec-2019 17:24	
Bromochloromethane	60		10	25	50	UG/L	50	18-Dec-2019 17:24	
Bromodichloromethane	25	U	10	25	50	UG/L	50	18-Dec-2019 17:24	
Bromoform	25	U	20	25	50	UG/L	50	18-Dec-2019 17:24	
Bromomethane	25	U	20	25	50	UG/L	50	18-Dec-2019 17:24	
Carbon disulfide	50	U	30	50	100	UG/L	50	18-Dec-2019 17:24	
Carbon tetrachloride	25	U	25	25	50	UG/L	50	18-Dec-2019 17:24	
Chlorobenzene	25	U	15	25	50	UG/L	50	18-Dec-2019 17:24	
Chloroethane	25	U	15	25	50	UG/L	50	18-Dec-2019 17:24	
Chloroform	31	J	10	25	50	UG/L	50	18-Dec-2019 17:24	

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

ALS Houston, US

Date: 31-Dec-19

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP/Site 18/24
 Sample ID: MW2_121319_a
 Collection Date: 13-Dec-2019 08:10

ANALYTICAL REPORT

WorkOrder:HS19120844
 Lab ID:HS19120844-02
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED	
VOLATILES ORGANICS BY METHOD 8260C		Method:SW8260						Analyst: PC	
Chloromethane	25	U	10	25	50	UG/L	50	18-Dec-2019 17:24	
cis-1,2-Dichloroethene	20,000		100	250	500	UG/L	500	18-Dec-2019 17:48	
cis-1,3-Dichloropropene	25	U	5.0	25	50	UG/L	50	18-Dec-2019 17:24	
Dibromochloromethane	25	U	15	25	50	UG/L	50	18-Dec-2019 17:24	
Dibromomethane	25	U	10	25	50	UG/L	50	18-Dec-2019 17:24	
Dichlorodifluoromethane	25	U	15	25	50	UG/L	50	18-Dec-2019 17:24	
Ethylbenzene	25	U	15	25	50	UG/L	50	18-Dec-2019 17:24	
Hexachlorobutadiene	25	U	50	25	50	UG/L	50	18-Dec-2019 17:24	
Isopropylbenzene	25	U	15	25	50	UG/L	50	18-Dec-2019 17:24	
m,p-Xylene	50	U	25	50	100	UG/L	50	18-Dec-2019 17:24	
Methylene chloride	41,000		200	500	1000	UG/L	500	18-Dec-2019 17:48	
n-Butylbenzene	25	U	20	25	50	UG/L	50	18-Dec-2019 17:24	
n-Propylbenzene	25	U	15	25	50	UG/L	50	18-Dec-2019 17:24	
Naphthalene	25	U	15	25	50	UG/L	50	18-Dec-2019 17:24	
o-Xylene	25	U	15	25	50	UG/L	50	18-Dec-2019 17:24	
sec-Butylbenzene	25	U	15	25	50	UG/L	50	18-Dec-2019 17:24	
Styrene	25	U	15	25	50	UG/L	50	18-Dec-2019 17:24	
tert-Butylbenzene	25	U	15	25	50	UG/L	50	18-Dec-2019 17:24	
Tetrachloroethene	25	U	15	25	50	UG/L	50	18-Dec-2019 17:24	
Toluene	25	U	10	25	50	UG/L	50	18-Dec-2019 17:24	
trans-1,2-Dichloroethene	30	J	10	25	50	UG/L	50	18-Dec-2019 17:24	
trans-1,3-Dichloropropene	25	U	10	25	50	UG/L	50	18-Dec-2019 17:24	
Trichloroethene	4,400		10	25	50	UG/L	50	18-Dec-2019 17:24	
Trichlorofluoromethane	25	U	15	25	50	UG/L	50	18-Dec-2019 17:24	
Vinyl chloride	25	U	10	25	50	UG/L	50	18-Dec-2019 17:24	
Surr: 1,2-Dichloroethane-d4	92.9			0	81-118	%REC	50	18-Dec-2019 17:24	
Surr: 1,2-Dichloroethane-d4	91.5			0	81-118	%REC	500	18-Dec-2019 17:48	
Surr: 4-Bromofluorobenzene	99.2			0	85-114	%REC	50	18-Dec-2019 17:24	
Surr: 4-Bromofluorobenzene	99.8			0	85-114	%REC	500	18-Dec-2019 17:48	
Surr: Dibromofluoromethane	93.2			0	80-119	%REC	50	18-Dec-2019 17:24	
Surr: Dibromofluoromethane	92.8			0	80-119	%REC	500	18-Dec-2019 17:48	
Surr: Toluene-d8	103			0	89-112	%REC	50	18-Dec-2019 17:24	
Surr: Toluene-d8	100			0	89-112	%REC	500	18-Dec-2019 17:48	
SEMIVOLATILES SIM		Method:SW8270SIM				Prep:SW3510 / 17-Dec-2019		Analyst: LG	
1,4-Dioxane	7.1		0.20	0.20	0.20	ug/L	20	23-Dec-2019 17:01	
Surr: 2-Fluorobiphenyl	118			0	40-140	%REC	20	23-Dec-2019 17:01	
Surr: 4-Terphenyl-d14	123			0	40-140	%REC	20	23-Dec-2019 17:01	
Surr: Nitrobenzene-d5	96.5			0	40-140	%REC	20	23-Dec-2019 17:01	

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

ALS Houston, US

Date: 31-Dec-19

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP/Site 18/24
 Sample ID: MW2_121319_a
 Collection Date: 13-Dec-2019 08:10

ANALYTICAL REPORT
 WorkOrder:HS19120844
 Lab ID:HS19120844-02
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A			Method:SW6020			Prep:SW3010A / 24-Dec-2019		Analyst: JHD
Aluminum	0.0314		0.00180	0.00500	0.0100	mg/L	1	27-Dec-2019 15:18
Antimony	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	27-Dec-2019 15:18
Arsenic	0.0431		0.000400	0.000500	0.00500	mg/L	1	27-Dec-2019 15:18
Barium	2.57		0.0380	0.0500	0.100	mg/L	20	30-Dec-2019 11:02
Beryllium	0.000394	J	0.000200	0.000500	0.00200	mg/L	1	27-Dec-2019 15:18
Cadmium	0.000495	J	0.000200	0.000500	0.00200	mg/L	1	27-Dec-2019 15:18
Calcium	77.1		0.0340	0.0500	0.500	mg/L	1	27-Dec-2019 15:18
Chromium	0.0200		0.000400	0.000500	0.00500	mg/L	1	27-Dec-2019 15:18
Cobalt	0.107		0.000100	0.000500	0.00500	mg/L	1	27-Dec-2019 15:18
Copper	0.00301	J	0.00100	0.00250	0.00500	mg/L	1	27-Dec-2019 15:18
Iron	35.6		0.0120	0.0500	0.200	mg/L	1	27-Dec-2019 15:18
Lead	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	27-Dec-2019 15:18
Magnesium	58.2		0.0100	0.0500	0.200	mg/L	1	27-Dec-2019 15:18
Manganese	6.27		0.0140	0.0500	0.100	mg/L	20	30-Dec-2019 11:02
Nickel	0.0612		0.000600	0.00100	0.00500	mg/L	1	27-Dec-2019 15:18
Potassium	2.98		0.0180	0.0500	0.200	mg/L	1	27-Dec-2019 15:18
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	27-Dec-2019 15:18
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	27-Dec-2019 15:18
Sodium	217		0.280	1.00	4.00	mg/L	20	30-Dec-2019 11:02
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	27-Dec-2019 15:18
Vanadium	0.00150	J	0.000600	0.00100	0.00500	mg/L	1	27-Dec-2019 15:18
Zinc	0.142		0.00200	0.00250	0.00500	mg/L	1	27-Dec-2019 15:18
MERCURY BY SW7470A			Method:SW7470			Prep:SW7470 / 24-Dec-2019		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	24-Dec-2019 17:43
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)			Method:NA			Analyst: SUB		
Subcontract Analysis	See Attached		0	0		NA	1	23-Dec-2019 17:05

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

ALS Houston, US

Date: 31-Dec-19

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP/Site 18/24
 Sample ID: 18CpTMW01SW_121319
 Collection Date: 13-Dec-2019 09:35

ANALYTICAL REPORT
 WorkOrder:HS19120844
 Lab ID:HS19120844-03
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED	
VOLATILES ORGANICS BY METHOD 8260C		Method:SW8260							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 13:00	
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	18-Dec-2019 13:00	
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	18-Dec-2019 13:00	
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 13:00	
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	18-Dec-2019 13:00	
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	18-Dec-2019 13:00	
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 13:00	
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	18-Dec-2019 13:00	
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	18-Dec-2019 13:00	
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	18-Dec-2019 13:00	
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 13:00	
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	18-Dec-2019 13:00	
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	18-Dec-2019 13:00	
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	18-Dec-2019 13:00	
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	18-Dec-2019 13:00	
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	18-Dec-2019 13:00	
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 13:00	
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	18-Dec-2019 13:00	
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 13:00	
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	18-Dec-2019 13:00	
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	18-Dec-2019 13:00	
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	18-Dec-2019 13:00	
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 13:00	
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	18-Dec-2019 13:00	
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	18-Dec-2019 13:00	
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 13:00	
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	18-Dec-2019 13:00	
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	18-Dec-2019 13:00	
Benzene	3.6		0.20	0.50	1.0	UG/L	1	18-Dec-2019 13:00	
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	18-Dec-2019 13:00	
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	18-Dec-2019 13:00	
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	18-Dec-2019 13:00	
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	18-Dec-2019 13:00	
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	18-Dec-2019 13:00	
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	18-Dec-2019 13:00	
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	18-Dec-2019 13:00	
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 13:00	
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 13:00	
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	18-Dec-2019 13:00	

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

ALS Houston, US

Date: 31-Dec-19

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP/Site 18/24
 Sample ID: 18CpTMW01SW_121319
 Collection Date: 13-Dec-2019 09:35

ANALYTICAL REPORT
 WorkOrder:HS19120844
 Lab ID:HS19120844-03
 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	18-Dec-2019 13:00	
cis-1,2-Dichloroethene	110		0.20	0.50	1.0	UG/L	1	18-Dec-2019 13:00	
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	18-Dec-2019 13:00	
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 13:00	
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	18-Dec-2019 13:00	
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 13:00	
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 13:00	
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	UG/L	1	18-Dec-2019 13:00	
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 13:00	
m,p-Xylene	0.73	J	0.50	1.0	2.0	UG/L	1	18-Dec-2019 13:00	
Methylene chloride	10		0.40	1.0	2.0	UG/L	1	18-Dec-2019 13:00	
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	18-Dec-2019 13:00	
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 13:00	
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 13:00	
o-Xylene	0.57	J	0.30	0.50	1.0	UG/L	1	18-Dec-2019 13:00	
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 13:00	
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 13:00	
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 13:00	
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 13:00	
Toluene	2.2		0.20	0.50	1.0	UG/L	1	18-Dec-2019 13:00	
trans-1,2-Dichloroethene	0.60	J	0.20	0.50	1.0	UG/L	1	18-Dec-2019 13:00	
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	18-Dec-2019 13:00	
Trichloroethene	64		0.20	0.50	1.0	UG/L	1	18-Dec-2019 13:00	
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 13:00	
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	18-Dec-2019 13:00	
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>92.1</i>			0	<i>81-118</i>	%REC	<i>1</i>	<i>18-Dec-2019 13:00</i>	
<i>Surr: 4-Bromofluorobenzene</i>	<i>99.6</i>			0	<i>85-114</i>	%REC	<i>1</i>	<i>18-Dec-2019 13:00</i>	
<i>Surr: Dibromofluoromethane</i>	<i>92.8</i>			0	<i>80-119</i>	%REC	<i>1</i>	<i>18-Dec-2019 13:00</i>	
<i>Surr: Toluene-d8</i>	<i>102</i>			0	<i>89-112</i>	%REC	<i>1</i>	<i>18-Dec-2019 13:00</i>	
SEMIVOLATILES SIM		Method:SW8270SIM				Prep:SW3510 / 17-Dec-2019		Analyst: LG	
1,4-Dioxane	0.19		0.010	0.010	0.010	ug/L	1	23-Dec-2019 12:13	
<i>Surr: 2-Fluorobiphenyl</i>	<i>115</i>			0	<i>40-140</i>	%REC	<i>1</i>	<i>23-Dec-2019 12:13</i>	
<i>Surr: 4-Terphenyl-d14</i>	<i>110</i>			0	<i>40-140</i>	%REC	<i>1</i>	<i>23-Dec-2019 12:13</i>	
<i>Surr: Nitrobenzene-d5</i>	<i>117</i>			0	<i>40-140</i>	%REC	<i>1</i>	<i>23-Dec-2019 12:13</i>	

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

ALS Houston, US

Date: 31-Dec-19

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP/Site 18/24
 Sample ID: 18CpTMW01SW_121319
 Collection Date: 13-Dec-2019 09:35

ANALYTICAL REPORT
 WorkOrder:HS19120844
 Lab ID:HS19120844-03
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A		Method:SW6020				Prep:SW3010A / 24-Dec-2019		Analyst: JHD
Aluminum	0.0105		0.00180	0.00500	0.0100	mg/L	1	27-Dec-2019 15:21
Antimony	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	27-Dec-2019 15:21
Arsenic	0.0145		0.000400	0.000500	0.00500	mg/L	1	27-Dec-2019 15:21
Barium	1.20		0.00190	0.00250	0.00500	mg/L	1	27-Dec-2019 15:21
Beryllium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	27-Dec-2019 15:21
Cadmium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	27-Dec-2019 15:21
Calcium	35.4		0.0340	0.0500	0.500	mg/L	1	27-Dec-2019 15:21
Chromium	0.000961	J	0.000400	0.000500	0.00500	mg/L	1	27-Dec-2019 15:21
Cobalt	0.000350	J	0.000100	0.000500	0.00500	mg/L	1	27-Dec-2019 15:21
Copper	0.00250	U	0.00100	0.00250	0.00500	mg/L	1	27-Dec-2019 15:21
Iron	65.1		0.0120	0.0500	0.200	mg/L	1	27-Dec-2019 15:21
Lead	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	27-Dec-2019 15:21
Magnesium	24.4		0.0100	0.0500	0.200	mg/L	1	27-Dec-2019 15:21
Manganese	0.666		0.000700	0.00250	0.00500	mg/L	1	27-Dec-2019 15:21
Nickel	0.00104	J	0.000600	0.00100	0.00500	mg/L	1	27-Dec-2019 15:21
Potassium	13.0		0.0180	0.0500	0.200	mg/L	1	27-Dec-2019 15:21
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	27-Dec-2019 15:21
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	27-Dec-2019 15:21
Sodium	122		0.0140	0.0500	0.200	mg/L	1	27-Dec-2019 15:21
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	27-Dec-2019 15:21
Vanadium	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	27-Dec-2019 15:21
Zinc	0.00328	J	0.00200	0.00250	0.00500	mg/L	1	27-Dec-2019 15:21
MERCURY BY SW7470A		Method:SW7470				Prep:SW7470 / 24-Dec-2019		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	24-Dec-2019 17:44
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		Method:NA				Analyst: SUB		
Subcontract Analysis	See Attached		0	0		NA	1	23-Dec-2019 17:05

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

ALS Houston, US

Date: 31-Dec-19

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP/Site 18/24
 Sample ID: AWD1_121319
 Collection Date: 13-Dec-2019 10:50

ANALYTICAL REPORT

WorkOrder:HS19120844
 Lab ID:HS19120844-04
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
SEMIVOLATILES SIM			Method:SW8270SIM			Prep:SW3510 / 17-Dec-2019		Analyst: LG
1,4-Dioxane	0.010	U	0.010	0.010	0.010	ug/L	1	23-Dec-2019 12:32
Surr: 2-Fluorobiphenyl	108			0	40-140	%REC	1	23-Dec-2019 12:32
Surr: 4-Terphenyl-d14	102			0	40-140	%REC	1	23-Dec-2019 12:32
Surr: Nitrobenzene-d5	115			0	40-140	%REC	1	23-Dec-2019 12:32
METALS BY ICPMS BY SW6020A			Method:SW6020			Prep:SW3010A / 24-Dec-2019		Analyst: JHD
Aluminum	4.91		0.180	0.500	1.00	mg/L	100	31-Dec-2019 14:44
Antimony	0.00119	J	0.000400	0.000500	0.00500	mg/L	1	27-Dec-2019 15:23
Arsenic	0.0181		0.000400	0.000500	0.00500	mg/L	1	27-Dec-2019 15:23
Barium	0.359		0.00190	0.00250	0.00500	mg/L	1	27-Dec-2019 15:23
Beryllium	0.000427	J	0.000200	0.000500	0.00200	mg/L	1	27-Dec-2019 15:23
Cadmium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	27-Dec-2019 15:23
Calcium	2.99		0.0340	0.0500	0.500	mg/L	1	27-Dec-2019 15:23
Chromium	0.0162		0.000400	0.000500	0.00500	mg/L	1	27-Dec-2019 15:23
Cobalt	0.00921		0.000100	0.000500	0.00500	mg/L	1	27-Dec-2019 15:23
Copper	0.00380	J	0.00100	0.00250	0.00500	mg/L	1	27-Dec-2019 15:23
Iron	8.27		0.0120	0.0500	0.200	mg/L	1	27-Dec-2019 15:23
Lead	0.00334	J	0.000600	0.00100	0.00500	mg/L	1	27-Dec-2019 15:23
Magnesium	3.68		0.0100	0.0500	0.200	mg/L	1	27-Dec-2019 15:23
Manganese	0.273		0.000700	0.00250	0.00500	mg/L	1	27-Dec-2019 15:23
Nickel	0.0195		0.000600	0.00100	0.00500	mg/L	1	27-Dec-2019 15:23
Potassium	3.30		0.0180	0.0500	0.200	mg/L	1	27-Dec-2019 15:23
Selenium	0.00445	J	0.00110	0.00250	0.00500	mg/L	1	27-Dec-2019 15:23
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	27-Dec-2019 15:23
Sodium	105		0.0140	0.0500	0.200	mg/L	1	27-Dec-2019 15:23
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	27-Dec-2019 15:23
Vanadium	0.00878		0.000600	0.00100	0.00500	mg/L	1	27-Dec-2019 15:23
Zinc	0.0165		0.00200	0.00250	0.00500	mg/L	1	27-Dec-2019 15:23
MERCURY BY SW7470A			Method:SW7470			Prep:SW7470 / 24-Dec-2019		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	24-Dec-2019 17:46
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)			Method:NA					Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	23-Dec-2019 17:05

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

ALS Houston, US

Date: 31-Dec-19

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP/Site 18/24
 Sample ID: Trip Blank
 Collection Date: 13-Dec-2019 08:10

ANALYTICAL REPORT
 WorkOrder:HS19120844
 Lab ID:HS19120844-05
 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD		Method:SW8260						
8260C								Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 12:36
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	18-Dec-2019 12:36
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	18-Dec-2019 12:36
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 12:36
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	18-Dec-2019 12:36
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	18-Dec-2019 12:36
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 12:36
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	18-Dec-2019 12:36
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	18-Dec-2019 12:36
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	18-Dec-2019 12:36
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 12:36
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	18-Dec-2019 12:36
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	18-Dec-2019 12:36
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	18-Dec-2019 12:36
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	18-Dec-2019 12:36
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	18-Dec-2019 12:36
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 12:36
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	18-Dec-2019 12:36
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 12:36
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	18-Dec-2019 12:36
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	18-Dec-2019 12:36
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	18-Dec-2019 12:36
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 12:36
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	18-Dec-2019 12:36
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	18-Dec-2019 12:36
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 12:36
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	18-Dec-2019 12:36
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	18-Dec-2019 12:36
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	18-Dec-2019 12:36
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	18-Dec-2019 12:36
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	18-Dec-2019 12:36
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	18-Dec-2019 12:36
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	18-Dec-2019 12:36
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	18-Dec-2019 12:36
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	18-Dec-2019 12:36
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	18-Dec-2019 12:36
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 12:36
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 12:36
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	18-Dec-2019 12:36

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

ALS Houston, US

Date: 31-Dec-19

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP/Site 18/24
 Sample ID: Trip Blank
 Collection Date: 13-Dec-2019 08:10

ANALYTICAL REPORT
 WorkOrder:HS19120844
 Lab ID:HS19120844-05
 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD		Method:SW8260						
8260C								Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	18-Dec-2019 12:36
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	18-Dec-2019 12:36
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	18-Dec-2019 12:36
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 12:36
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	18-Dec-2019 12:36
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 12:36
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 12:36
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	UG/L	1	18-Dec-2019 12:36
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 12:36
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	18-Dec-2019 12:36
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	18-Dec-2019 12:36
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	18-Dec-2019 12:36
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 12:36
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 12:36
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 12:36
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 12:36
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 12:36
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 12:36
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 12:36
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	18-Dec-2019 12:36
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	18-Dec-2019 12:36
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	18-Dec-2019 12:36
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	18-Dec-2019 12:36
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	18-Dec-2019 12:36
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	18-Dec-2019 12:36
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>92.5</i>			<i>0</i>	<i>81-118</i>	<i>%REC</i>	<i>1</i>	<i>18-Dec-2019 12:36</i>
<i>Surr: 4-Bromofluorobenzene</i>	<i>98.9</i>			<i>0</i>	<i>85-114</i>	<i>%REC</i>	<i>1</i>	<i>18-Dec-2019 12:36</i>
<i>Surr: Dibromofluoromethane</i>	<i>93.5</i>			<i>0</i>	<i>80-119</i>	<i>%REC</i>	<i>1</i>	<i>18-Dec-2019 12:36</i>
<i>Surr: Toluene-d8</i>	<i>103</i>			<i>0</i>	<i>89-112</i>	<i>%REC</i>	<i>1</i>	<i>18-Dec-2019 12:36</i>

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

Weight / Prep Log

Client: Bhate Environmental Associates, Inc.

Project: LHAAP/Site 18/24

WorkOrder: HS19120844

Batch ID: 148814	Start Date: 17 Dec 2019 07:00	End Date: 17 Dec 2019 15:00
Method: SV AQ SEP FUN EXTRACT-LOWLEV - 3510C	Prep Code: 3510_B_SIM	

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19120844-01	1	1000 (mL)	1 (mL)	0.001
HS19120844-02	1	1000 (mL)	1 (mL)	0.001
HS19120844-03	1	1000 (mL)	1 (mL)	0.001
HS19120844-04	1	1000 (mL)	1 (mL)	0.001

Batch ID: 149099	Start Date: 24 Dec 2019 10:30	End Date: 24 Dec 2019 12:30
Method: MERCURY PREP BY 7470A- WATER	Prep Code: HG_WPR	

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19120844-01		10 (mL)	10 (mL)	1
HS19120844-02		10 (mL)	10 (mL)	1
HS19120844-03		10 (mL)	10 (mL)	1
HS19120844-04		10 (mL)	10 (mL)	1

Batch ID: 149105	Start Date: 24 Dec 2019 12:00	End Date: 24 Dec 2019 16:00
Method: WATER - SW3010A	Prep Code: 3010A	

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19120844-01		10 (mL)	10 (mL)	1
HS19120844-02		10 (mL)	10 (mL)	1
HS19120844-03		10 (mL)	10 (mL)	1
HS19120844-04		10 (mL)	10 (mL)	1

ALS Houston, US

Date: 31-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP/Site 18/24
WorkOrder: HS19120844

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: 148814 (1)		Test Name : SEMIVOLATILES SIM			Matrix: Groundwater	
HS19120844-01	MW2_121319	13 Dec 2019 08:10		17 Dec 2019 07:00	23 Dec 2019 16:41	20
HS19120844-02	MW2_121319_a	13 Dec 2019 08:10		17 Dec 2019 07:00	23 Dec 2019 17:01	20
HS19120844-03	18CpTMW01SW_121319	13 Dec 2019 09:35		17 Dec 2019 07:00	23 Dec 2019 12:13	1
HS19120844-04	AWD1_121319	13 Dec 2019 10:50		17 Dec 2019 07:00	23 Dec 2019 12:32	1
Batch ID: 149099 (0)		Test Name : MERCURY BY SW7470A			Matrix: Groundwater	
HS19120844-01	MW2_121319	13 Dec 2019 08:10		24 Dec 2019 10:30	24 Dec 2019 17:41	1
HS19120844-02	MW2_121319_a	13 Dec 2019 08:10		24 Dec 2019 10:30	24 Dec 2019 17:43	1
HS19120844-03	18CpTMW01SW_121319	13 Dec 2019 09:35		24 Dec 2019 10:30	24 Dec 2019 17:44	1
HS19120844-04	AWD1_121319	13 Dec 2019 10:50		24 Dec 2019 10:30	24 Dec 2019 17:46	1
Batch ID: 149105 (0)		Test Name : METALS BY ICPMS BY SW6020A			Matrix: Groundwater	
HS19120844-01	MW2_121319	13 Dec 2019 08:10		24 Dec 2019 16:00	30 Dec 2019 11:00	20
HS19120844-01	MW2_121319	13 Dec 2019 08:10		24 Dec 2019 16:00	27 Dec 2019 15:00	1
HS19120844-02	MW2_121319_a	13 Dec 2019 08:10		24 Dec 2019 16:00	30 Dec 2019 11:02	20
HS19120844-02	MW2_121319_a	13 Dec 2019 08:10		24 Dec 2019 16:00	27 Dec 2019 15:18	1
HS19120844-03	18CpTMW01SW_121319	13 Dec 2019 09:35		24 Dec 2019 16:00	27 Dec 2019 15:21	1
HS19120844-04	AWD1_121319	13 Dec 2019 10:50		24 Dec 2019 16:00	31 Dec 2019 14:44	100
HS19120844-04	AWD1_121319	13 Dec 2019 10:50		24 Dec 2019 16:00	27 Dec 2019 15:23	1
Batch ID: R352800 (0)		Test Name : VOLATILES ORGANICS BY METHOD 8260C			Matrix: Water	
HS19120844-05	Trip Blank	13 Dec 2019 08:10			18 Dec 2019 12:36	1
Batch ID: R352800 (0)		Test Name : VOLATILES ORGANICS BY METHOD 8260C			Matrix: Groundwater	
HS19120844-01	MW2_121319	13 Dec 2019 08:10			18 Dec 2019 17:00	50
HS19120844-01	MW2_121319	13 Dec 2019 08:10			18 Dec 2019 16:36	50
HS19120844-02	MW2_121319_a	13 Dec 2019 08:10			18 Dec 2019 17:48	500
HS19120844-02	MW2_121319_a	13 Dec 2019 08:10			18 Dec 2019 17:24	50
HS19120844-03	18CpTMW01SW_121319	13 Dec 2019 09:35			18 Dec 2019 13:00	1
Batch ID: R353152 (0)		Test Name : SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)			Matrix: Groundwater	
HS19120844-01	MW2_121319	13 Dec 2019 08:10			23 Dec 2019 17:05	1
HS19120844-02	MW2_121319_a	13 Dec 2019 08:10			23 Dec 2019 17:05	1
HS19120844-03	18CpTMW01SW_121319	13 Dec 2019 09:35			23 Dec 2019 17:05	1
HS19120844-04	AWD1_121319	13 Dec 2019 10:50			23 Dec 2019 17:05	1

ALS Houston, US

Date: 31-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP/Site 18/24
WorkOrder: HS19120844

QC BATCH REPORT

Batch ID: 149099 (0)		Instrument: HG03		Method: MERCURY BY SW7470A						
MBLK	Sample ID: MBLK-149099	Units: mg/L		Analysis Date: 24-Dec-2019 17:00						
Client ID:	Run ID: HG03_353245	SeqNo: 5408656		PrepDate: 24-Dec-2019		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual	
Mercury	0.000100	0.000200							U	
LCS	Sample ID: LCS-149099	Units: mg/L		Analysis Date: 24-Dec-2019 17:02						
Client ID:	Run ID: HG03_353245	SeqNo: 5408657		PrepDate: 24-Dec-2019		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual	
Mercury	0.00500	0.000200	0.005	0	100	82 - 119				
MS	Sample ID: HS19120702-03MS	Units: mg/L		Analysis Date: 24-Dec-2019 17:05						
Client ID:	Run ID: HG03_353245	SeqNo: 5408659		PrepDate: 24-Dec-2019		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual	
Mercury	0.00495	0.000200	0.005	-0.000005000	99.1	82 - 119				
MSD	Sample ID: HS19120702-03MSD	Units: mg/L		Analysis Date: 24-Dec-2019 17:07						
Client ID:	Run ID: HG03_353245	SeqNo: 5408660		PrepDate: 24-Dec-2019		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual	
Mercury	0.00505	0.000200	0.005	-0.000005000	101	82 - 119	0.004950	2	20	
The following samples were analyzed in this batch:										
HS19120844-01		HS19120844-02		HS19120844-03		HS19120844-04				

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Client: Bhate Environmental Associates, Inc.
Project: LHAAP/Site 18/24
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QC BATCH REPORT

Batch ID: 149105 (0)		Instrument: ICPMS05		Method: METALS BY ICPMS BY SW6020A						
LCS	Sample ID: LCS-149105	Units: mg/L			Analysis Date: 27-Dec-2019 14:33					
Client ID:	Run ID: ICPMS05_353383	SeqNo: 5412820	PrepDate: 24-Dec-2019	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.09227	0.0100	0.1	0	92.3	84 - 117				
Antimony	0.05171	0.00500	0.05	0	103	85 - 117				
Arsenic	0.05071	0.00500	0.05	0	101	84 - 116				
Barium	0.04742	0.00500	0.05	0	94.8	86 - 114				
Beryllium	0.04757	0.00200	0.05	0	95.1	83 - 121				
Cadmium	0.04941	0.00200	0.05	0	98.8	87 - 115				
Calcium	5.231	0.500	5	0	105	87 - 118				
Chromium	0.04905	0.00500	0.05	0	98.1	85 - 116				
Cobalt	0.04929	0.00500	0.05	0	98.6	86 - 115				
Copper	0.04986	0.00500	0.05	0	99.7	85 - 118				
Iron	5.023	0.200	5	0	100	87 - 118				
Lead	0.04781	0.00500	0.05	0	95.6	88 - 115				
Magnesium	5.31	0.200	5	0	106	83 - 118				
Manganese	0.04872	0.00500	0.05	0	97.4	87 - 115				
Nickel	0.05058	0.00500	0.05	0	101	85 - 117				
Potassium	5.146	0.200	5	0	103	87 - 115				
Selenium	0.0501	0.00500	0.05	0	100	80 - 120				
Silver	0.04799	0.00500	0.05	0	96.0	85 - 116				
Sodium	5.351	0.200	5	0	107	85 - 117				
Thallium	0.04462	0.00200	0.05	0	89.2	82 - 116				
Vanadium	0.04983	0.00500	0.05	0	99.7	86 - 115				
Zinc	0.05178	0.00500	0.05	0	104	83 - 119				

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Project: LHAAP/Site 18/24
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QC BATCH REPORT

Batch ID: 149105 (0)		Instrument: ICPMS05			Method: METALS BY ICPMS BY SW6020A					
MS	Sample ID: HS19120702-03MS	Units: mg/L			Analysis Date: 27-Dec-2019 16:20					
Client ID:	Run ID: ICPMS05_353383	SeqNo: 5412902		PrepDate: 24-Dec-2019		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.1096	0.0100	0.1	0.02447	85.2	84 - 117				
Antimony	0.05121	0.00500	0.05	0.000693	101	85 - 117				
Arsenic	0.05093	0.00500	0.05	0.0013	99.3	84 - 116				
Barium	0.9021	0.00500	0.05	1.115	-425	86 - 114				SO
Cadmium	0.04632	0.00200	0.05	0.0005	91.6	87 - 115				
Calcium	72.84	0.500	5	90.85	-360	87 - 118				SO
Chromium	0.5436	0.00500	0.05	0.6401	-193	85 - 116				SO
Cobalt	0.05631	0.00500	0.05	0.01007	92.5	86 - 115				
Copper	0.0567	0.00500	0.05	0.0109	91.6	85 - 118				
Lead	0.04614	0.00500	0.05	0	92.3	88 - 115				
Magnesium	31.35	0.200	5	33.71	-47.2	83 - 118				SO
Manganese	0.2371	0.00500	0.05	0.2568	-39.2	87 - 115				SO
Nickel	0.2751	0.00500	0.05	0.2826	-15.1	85 - 117				SO
Potassium	6.969	0.200	5	2.068	98.0	87 - 115				
Selenium	0.0481	0.00500	0.05	0	96.2	80 - 120				
Silver	0.04409	0.00500	0.05	0	88.2	85 - 116				
Sodium	353.2	0.200	5	417.6	-1290	85 - 117				SEO
Thallium	0.04258	0.00200	0.05	0	85.2	82 - 116				
Vanadium	0.05168	0.00500	0.05	0.003369	96.6	86 - 115				
Zinc	0.0596	0.00500	0.05	0.003288	113	83 - 119				

MS	Sample ID: HS19120702-03MS	Units: mg/L			Analysis Date: 27-Dec-2019 14:14					
Client ID:	Run ID: ICPMS05_353383	SeqNo: 5412813		PrepDate: 24-Dec-2019		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	0.05441	0.00200	0.05	-0.000001	109	83 - 121				
Iron	11.63	0.200	5	6.062	111	87 - 118				

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Client: Bhate Environmental Associates, Inc.
Project: LHAAP/Site 18/24
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QC BATCH REPORT

Batch ID: 149105 (0)		Instrument: ICPMS05			Method: METALS BY ICPMS BY SW6020A					
MSD	Sample ID: HS19120702-03MSD	Units: mg/L			Analysis Date: 27-Dec-2019 14:16					
Client ID:	Run ID: ICPMS05_353383	SeqNo: 5412814		PrepDate: 24-Dec-2019		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.131	0.0100	0.1	0.02447	107	84 - 117	0.1248	4.86	20	
Beryllium	0.05487	0.00200	0.05	-0.000001	110	83 - 121	0.05441	0.831	20	
Iron	11.43	0.200	5	6.062	107	87 - 118	11.63	1.74	20	
MSD	Sample ID: HS19120702-03MSD	Units: mg/L			Analysis Date: 27-Dec-2019 16:22					
Client ID:	Run ID: ICPMS05_353383	SeqNo: 5412903		PrepDate: 24-Dec-2019		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05219	0.00500	0.05	0.000693	103	85 - 117	0.05121	1.88	20	
Arsenic	0.0529	0.00500	0.05	0.0013	103	84 - 116	0.05093	3.8	20	
Barium	0.99	0.00500	0.05	1.115	-249	86 - 114	0.9021	9.3	20	SO
Cadmium	0.04901	0.00200	0.05	0.0005	97.0	87 - 115	0.04632	5.64	20	
Calcium	74.37	0.500	5	90.85	-330	87 - 118	72.84	2.07	20	SO
Chromium	0.5638	0.00500	0.05	0.6401	-153	85 - 116	0.5436	3.64	20	SO
Cobalt	0.05778	0.00500	0.05	0.01007	95.4	86 - 115	0.05631	2.58	20	
Copper	0.05693	0.00500	0.05	0.0109	92.0	85 - 118	0.0567	0.403	20	
Lead	0.04959	0.00500	0.05	0	99.2	88 - 115	0.04614	7.2	20	
Magnesium	32.11	0.200	5	33.71	-32.1	83 - 118	31.35	2.39	20	SO
Manganese	0.2455	0.00500	0.05	0.2568	-22.6	87 - 115	0.2371	3.46	20	SO
Nickel	0.2784	0.00500	0.05	0.2826	-8.52	85 - 117	0.2751	1.19	20	SO
Potassium	6.782	0.200	5	2.068	94.3	87 - 115	6.969	2.72	20	
Selenium	0.04645	0.00500	0.05	0	92.9	80 - 120	0.0481	3.5	20	
Silver	0.04697	0.00500	0.05	0	93.9	85 - 116	0.04409	6.33	20	
Sodium	355.3	0.200	5	417.6	-1250	85 - 117	353.2	0.58	20	SEO
Thallium	0.04625	0.00200	0.05	0	92.5	82 - 116	0.04258	8.27	20	
Vanadium	0.0527	0.00500	0.05	0.003369	98.7	86 - 115	0.05168	1.95	20	
Zinc	0.05108	0.00500	0.05	0.003288	95.6	83 - 119	0.0596	15.4	20	

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Project: LHAAP/Site 18/24
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QC BATCH REPORT

Batch ID: 149105 (0)		Instrument: ICPMS05		Method: METALS BY ICPMS BY SW6020A					
PDS	Sample ID: HS19120702-03PDS	Units: mg/L			Analysis Date: 27-Dec-2019 14:19				
Client ID:	Run ID: ICPMS05_353383	SeqNo: 5412815		PrepDate: 24-Dec-2019		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Antimony	0.08256	0.00500	0.1	0.000693	81.9	80 - 120			
Arsenic	0.0932	0.00500	0.1	0.0013	91.9	80 - 120			
Barium	1.135	0.00500	0.1	1.115	20.3	80 - 120			SO
Cadmium	0.08881	0.00200	0.1	0.0005	88.3	80 - 120			
Calcium	94.39	0.500	10	90.85	35.5	80 - 120			SO
Chromium	0.6802	0.00500	0.1	0.6401	40.2	80 - 120			SO
Cobalt	0.09637	0.00500	0.1	0.01007	86.3	80 - 120			
Copper	0.09484	0.00500	0.1	0.0109	83.9	80 - 120			
Iron	14.45	0.200	10	6.062	83.8	80 - 120			
Lead	0.08693	0.00500	0.1	0.00013	86.8	80 - 120			
Potassium	10.8	0.200	10	2.068	87.3	80 - 120			
Selenium	0.086	0.00500	0.1	0.00011	85.9	80 - 120			
Silver	0.08364	0.00500	0.1	0.000013	83.6	80 - 120			
Thallium	0.08765	0.00200	0.1	0.000014	87.6	80 - 120			
Vanadium	0.09222	0.00500	0.1	0.003369	88.8	80 - 120			
Zinc	0.09081	0.00500	0.1	0.003288	87.5	80 - 120			
PDS	Sample ID: HS19120702-03PDS	Units: mg/L			Analysis Date: 27-Dec-2019 16:29				
Client ID:	Run ID: ICPMS05_353383	SeqNo: 5412906		PrepDate: 24-Dec-2019		DF: 10			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Barium	1.989	0.0500	1	0.8967	109	80 - 120			
Calcium	179.2	5.00	100	74.05	105	80 - 120			
Chromium	1.633	0.0500	1	0.52	111	80 - 120			
Sodium	495.9	2.00	100	375.2	121	80 - 120			S

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Client: Bhate Environmental Associates, Inc.
Project: LHAAP/Site 18/24
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QC BATCH REPORT

Batch ID: 149105 (0)		Instrument: ICPMS05		Method: METALS BY ICPMS BY SW6020A						
SD	Sample ID: HS19120702-03SD	Units: mg/L			Analysis Date: 27-Dec-2019 14:12					
Client ID:	Run ID: ICPMS05_353383	SeqNo: 5412812	PrepDate: 24-Dec-2019	DF: 5						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit Qual	
Aluminum	0.01228	0.0500					0.02447	0 10	J	
Antimony	0.00250	0.0250					0.000693	0 10	U	
Arsenic	0.00250	0.0250					0.0013	0 10	U	
Beryllium	0.00250	0.0100					-0.000001	0 10	U	
Cadmium	0.00250	0.0100					0.0005	0 10	U	
Cobalt	0.009437	0.0250					0.01007	0 10	J	
Copper	0.01067	0.0250					0.0109	0 10	J	
Iron	5.55	1.00					6.062	8.46 10		
Lead	0.00500	0.0250					0.00013	0 10	U	
Magnesium	31.48	1.00					33.71	6.62 10		
Manganese	0.2333	0.0250					0.2568	9.15 10		
Nickel	0.2685	0.0250					0.2826	4.99 10		
Potassium	1.943	1.00					2.068	6.03 10		
Selenium	0.0125	0.0250					0.00011	0 10	U	
Silver	0.00250	0.0250					0.000013	0 10	U	
Sodium	396.1	1.00					417.6	5.15 10		
Thallium	0.00250	0.0100					0.000014	0 10	U	
Vanadium	0.005733	0.0250					0.003369	0 10	J	
Zinc	0.0125	0.0250					0.003288	0 10	U	

SD	Sample ID: HS19120702-03SD	Units: mg/L			Analysis Date: 27-Dec-2019 16:26				
Client ID:	Run ID: ICPMS05_353383	SeqNo: 5412905	PrepDate: 24-Dec-2019	DF: 50					
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit Qual
Barium	0.9191	0.250					0.8967	2.49 10	
Calcium	72.7	25.0					74.05	1.82 10	
Chromium	0.5425	0.250					0.52	4.32 10	
Sodium	379.9	10.0					375.2	1.26 10	

The following samples were analyzed in this batch: HS19120844-01 HS19120844-02 HS19120844-03 HS19120844-04

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Client: Bhate Environmental Associates, Inc.
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QC BATCH REPORT

Batch ID: 148814 (1)		Instrument: SV-6		Method: SEMIVOLATILES SIM						
MBLK	Sample ID: MBLK-148814	Units: ug/L			Analysis Date: 20-Dec-2019 08:55					
Client ID:	Run ID: SV-6_352996	SeqNo: 5406171		PrepDate: 17-Dec-2019		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
1,4-Dioxane	0.010	0.010							U	
<i>Surr: 2-Fluorobiphenyl</i>	<i>0.09654</i>	<i>0</i>	<i>0.08</i>	<i>0</i>	<i>121</i>	<i>40 - 140</i>				
<i>Surr: 4-Terphenyl-d14</i>	<i>0.09022</i>	<i>0</i>	<i>0.08</i>	<i>0</i>	<i>113</i>	<i>40 - 140</i>				
<i>Surr: Nitrobenzene-d5</i>	<i>0.08627</i>	<i>0</i>	<i>0.08</i>	<i>0</i>	<i>108</i>	<i>40 - 140</i>				
LCS	Sample ID: LCS1-148814	Units: ug/L			Analysis Date: 20-Dec-2019 09:14					
Client ID:	Run ID: SV-6_352996	SeqNo: 5406172		PrepDate: 17-Dec-2019		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
1,4-Dioxane	0.1101	0.010	0.08	0	138	40 - 140				
<i>Surr: 2-Fluorobiphenyl</i>	<i>0.09483</i>	<i>0</i>	<i>0.08</i>	<i>0</i>	<i>119</i>	<i>40 - 140</i>				
<i>Surr: 4-Terphenyl-d14</i>	<i>0.07915</i>	<i>0</i>	<i>0.08</i>	<i>0</i>	<i>98.9</i>	<i>40 - 140</i>				
<i>Surr: Nitrobenzene-d5</i>	<i>0.07534</i>	<i>0</i>	<i>0.08</i>	<i>0</i>	<i>94.2</i>	<i>40 - 140</i>				
LCSD	Sample ID: LCSD1-148814	Units: ug/L			Analysis Date: 20-Dec-2019 09:33					
Client ID:	Run ID: SV-6_352996	SeqNo: 5406173		PrepDate: 17-Dec-2019		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
1,4-Dioxane	0.1039	0.010	0.08	0	130	40 - 140	0.1101	5.76	20	
<i>Surr: 2-Fluorobiphenyl</i>	<i>0.07777</i>	<i>0</i>	<i>0.08</i>	<i>0</i>	<i>97.2</i>	<i>40 - 140</i>	<i>0.09483</i>	<i>19.8</i>	<i>20</i>	
<i>Surr: 4-Terphenyl-d14</i>	<i>0.07343</i>	<i>0</i>	<i>0.08</i>	<i>0</i>	<i>91.8</i>	<i>40 - 140</i>	<i>0.07915</i>	<i>7.49</i>	<i>20</i>	
<i>Surr: Nitrobenzene-d5</i>	<i>0.0755</i>	<i>0</i>	<i>0.08</i>	<i>0</i>	<i>94.4</i>	<i>40 - 140</i>	<i>0.07534</i>	<i>0.209</i>	<i>20</i>	
The following samples were analyzed in this batch:										
HS19120844-01		HS19120844-02		HS19120844-03		HS19120844-04				

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Client: Bhate Environmental Associates, Inc.
Project: LHAAP/Site 18/24
WorkOrder: HS19120844

QC BATCH REPORT

Batch ID: R352800 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MBLK	Sample ID: VBLKW-191218	Units: UG/L			Analysis Date: 18-Dec-2019 11:47					
Client ID:	Run ID: VOA6_352800	SeqNo: 5400232	PrepDate:	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	1.0	2.0								U
Carbon tetrachloride	0.50	1.0								U
Chlorobenzene	0.50	1.0								U
Chloroethane	0.50	1.0								U
Chloroform	0.50	1.0								U
Chloromethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
cis-1,3-Dichloropropene	0.50	1.0								U
Dibromochloromethane	0.50	1.0								U
Dibromomethane	0.50	1.0								U
Dichlorodifluoromethane	0.50	1.0								U
Ethylbenzene	0.50	1.0								U
Hexachlorobutadiene	0.50	1.0								U
Isopropylbenzene	0.50	1.0								U
m,p-Xylene	1.0	2.0								U
Methylene chloride	1.0	2.0								U
Naphthalene	0.50	1.0								U
n-Butylbenzene	0.50	1.0								U
n-Propylbenzene	0.50	1.0								U
o-Xylene	0.50	1.0								U
sec-Butylbenzene	0.50	1.0								U
Styrene	0.50	1.0								U
tert-Butylbenzene	0.50	1.0								U
Tetrachloroethene	0.50	1.0								U
Toluene	0.50	1.0								U
trans-1,2-Dichloroethene	0.50	1.0								U
trans-1,3-Dichloropropene	0.50	1.0								U
Trichloroethene	0.50	1.0								U
Trichlorofluoromethane	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	45.92	1.0	50	0	91.8	81 - 118				
Surr: 4-Bromofluorobenzene	49.77	1.0	50	0	99.5	85 - 114				
Surr: Dibromofluoromethane	46.5	1.0	50	0	93.0	80 - 119				
Surr: Toluene-d8	50.66	1.0	50	0	101	89 - 112				

ALS Houston, US

Date: 31-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP/Site 18/24
WorkOrder: HS19120844

QC BATCH REPORT

Batch ID: R352800 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
LCS	Sample ID: VLCSW-191218	Units: UG/L			Analysis Date: 18-Dec-2019 10:59					
Client ID:	Run ID: VOA6_352800	SeqNo: 5400231	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	18.75	1.0	20	0	93.7	78 - 124				
1,1,1-Trichloroethane	18.87	1.0	20	0	94.4	74 - 131				
1,1,2,2-Tetrachloroethane	19.69	1.0	20	0	98.4	71 - 121				
1,1,2-Trichloroethane	19.07	1.0	20	0	95.4	80 - 119				
1,1-Dichloroethane	20.3	1.0	20	0	101	77 - 125				
1,1-Dichloroethene	15.99	1.0	20	0	80.0	71 - 131				
1,1-Dichloropropene	19.4	1.0	20	0	97.0	78 - 125				
1,2,3-Trichlorobenzene	26.44	1.0	20	0	132	69 - 129				S
1,2,3-Trichloropropane	20.04	1.0	20	0	100	73 - 122				
1,2,4-Trichlorobenzene	22.69	1.0	20	0	113	69 - 130				
1,2,4-Trimethylbenzene	20.2	1.0	20	0	101	76 - 124				
1,2-Dibromo-3-chloropropane	18.75	1.0	20	0	93.8	62 - 128				
1,2-Dibromoethane	18.78	1.0	20	0	93.9	77 - 121				
1,2-Dichlorobenzene	19.23	1.0	20	0	96.1	80 - 119				
1,2-Dichloroethane	18.47	1.0	20	0	92.4	73 - 128				
1,2-Dichloropropane	19.79	1.0	20	0	99.0	78 - 122				
1,3,5-Trimethylbenzene	20.83	1.0	20	0	104	75 - 124				
1,3-Dichlorobenzene	19.63	1.0	20	0	98.1	80 - 119				
1,3-Dichloropropane	19.15	1.0	20	0	95.7	80 - 119				
1,4-Dichlorobenzene	19.11	1.0	20	0	95.5	79 - 118				
2,2-Dichloropropane	19.07	1.0	20	0	95.3	60 - 139				
2-Butanone	39.23	2.0	40	0	98.1	56 - 143				
2-Chlorotoluene	21.21	1.0	20	0	106	79 - 122				
2-Hexanone	37	2.0	40	0	92.5	57 - 139				
4-Chlorotoluene	20.39	1.0	20	0	102	78 - 122				
4-Isopropyltoluene	20.29	1.0	20	0	101	77 - 127				
4-Methyl-2-pentanone	36.54	2.0	40	0	91.3	67 - 130				
Acetone	30.87	2.0	40	0	77.2	39 - 160				
Benzene	20.25	1.0	20	0	101	79 - 120				
Bromobenzene	20.24	1.0	20	0	101	80 - 120				
Bromochloromethane	19.52	1.0	20	0	97.6	78 - 123				
Bromodichloromethane	18.87	1.0	20	0	94.4	79 - 125				
Bromoform	17.75	1.0	20	0	88.8	66 - 130				
Bromomethane	15.81	1.0	20	0	79.1	53 - 141				

ALS Houston, US

Date: 31-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP/Site 18/24
WorkOrder: HS19120844

QC BATCH REPORT

Batch ID: R352800 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
LCS	Sample ID: VLCSW-191218	Units: UG/L			Analysis Date: 18-Dec-2019 10:59					
Client ID:	Run ID: VOA6_352800	SeqNo: 5400231		PrepDate:		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	43.34	2.0	40	0	108	64 - 133				
Carbon tetrachloride	17.84	1.0	20	0	89.2	72 - 136				
Chlorobenzene	18.81	1.0	20	0	94.1	82 - 118				
Chloroethane	16.01	1.0	20	0	80.0	60 - 138				
Chloroform	18.31	1.0	20	0	91.5	79 - 124				
Chloromethane	15.4	1.0	20	0	77.0	50 - 139				
cis-1,2-Dichloroethene	20.74	1.0	20	0	104	78 - 123				
cis-1,3-Dichloropropene	19.9	1.0	20	0	99.5	75 - 124				
Dibromochloromethane	18.71	1.0	20	0	93.6	74 - 126				
Dibromomethane	18.75	1.0	20	0	93.8	79 - 123				
Dichlorodifluoromethane	20.19	1.0	20	0	101	32 - 152				
Ethylbenzene	19.39	1.0	20	0	96.9	79 - 121				
Hexachlorobutadiene	23.7	1.0	20	0	118	66 - 134				
Isopropylbenzene	18.95	1.0	20	0	94.8	72 - 131				
m,p-Xylene	38.19	2.0	40	0	95.5	80 - 121				
Methylene chloride	19.55	2.0	20	0	97.7	74 - 124				
Naphthalene	20.36	1.0	20	0	102	61 - 128				
n-Butylbenzene	19.96	1.0	20	0	99.8	75 - 128				
n-Propylbenzene	20.64	1.0	20	0	103	76 - 126				
o-Xylene	18.95	1.0	20	0	94.8	78 - 122				
sec-Butylbenzene	20.35	1.0	20	0	102	77 - 126				
Styrene	18.94	1.0	20	0	94.7	78 - 123				
tert-Butylbenzene	20.49	1.0	20	0	102	78 - 124				
Tetrachloroethene	18.23	1.0	20	0	91.2	74 - 129				
Toluene	19.35	1.0	20	0	96.8	80 - 121				
trans-1,2-Dichloroethene	20.09	1.0	20	0	100	75 - 124				
trans-1,3-Dichloropropene	19.51	1.0	20	0	97.5	73 - 127				
Trichloroethene	19.41	1.0	20	0	97.1	79 - 123				
Trichlorofluoromethane	15.79	1.0	20	0	79.0	65 - 141				
Vinyl chloride	16.62	1.0	20	0	83.1	58 - 137				
Surr: 1,2-Dichloroethane-d4	48.27	1.0	50	0	96.5	81 - 118				
Surr: 4-Bromofluorobenzene	47.67	1.0	50	0	95.3	85 - 114				
Surr: Dibromofluoromethane	47.78	1.0	50	0	95.6	80 - 119				
Surr: Toluene-d8	44.63	1.0	50	0	89.3	89 - 112				

ALS Houston, US

Date: 31-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP/Site 18/24
WorkOrder: HS19120844

QC BATCH REPORT

Batch ID: R352800 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MS	Sample ID: HS19120843-04MS	Units: UG/L			Analysis Date: 18-Dec-2019 15:00					
Client ID:	Run ID: VOA6_352800	SeqNo: 5400240	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	19.65	1.0	20	0	98.2	78 - 124				
1,1,1-Trichloroethane	18.16	1.0	20	0	90.8	74 - 131				
1,1,2,2-Tetrachloroethane	20.5	1.0	20	0	102	71 - 121				
1,1,2-Trichloroethane	19.52	1.0	20	0	97.6	80 - 119				
1,1-Dichloroethane	21.61	1.0	20	3.014	93.0	77 - 125				
1,1-Dichloroethene	14.36	1.0	20	0	71.8	71 - 131				
1,1-Dichloropropene	19.43	1.0	20	0	97.1	78 - 125				
1,2,3-Trichlorobenzene	23.1	1.0	20	0	116	69 - 129				
1,2,3-Trichloropropane	21.01	1.0	20	0	105	73 - 122				
1,2,4-Trichlorobenzene	22.03	1.0	20	0	110	69 - 130				
1,2,4-Trimethylbenzene	22.53	1.0	20	0	113	76 - 124				
1,2-Dibromo-3-chloropropane	19.44	1.0	20	0	97.2	62 - 128				
1,2-Dibromoethane	18.67	1.0	20	0	93.4	77 - 121				
1,2-Dichlorobenzene	20.5	1.0	20	0	103	80 - 119				
1,2-Dichloroethane	17.54	1.0	20	0	87.7	73 - 128				
1,2-Dichloropropane	18.91	1.0	20	0	94.5	78 - 122				
1,3,5-Trimethylbenzene	23.05	1.0	20	0	115	75 - 124				
1,3-Dichlorobenzene	21.78	1.0	20	0	109	80 - 119				
1,3-Dichloropropane	19.64	1.0	20	0	98.2	80 - 119				
1,4-Dichlorobenzene	20.72	1.0	20	0	104	79 - 118				
2,2-Dichloropropane	18.12	1.0	20	0	90.6	60 - 139				
2-Butanone	32.03	2.0	40	0	80.1	56 - 143				
2-Chlorotoluene	23.54	1.0	20	0	118	79 - 122				
2-Hexanone	34.43	2.0	40	0	86.1	57 - 139				
4-Chlorotoluene	22.48	1.0	20	0	112	78 - 122				
4-Isopropyltoluene	22.68	1.0	20	0	113	77 - 127				
4-Methyl-2-pentanone	36.28	2.0	40	0	90.7	67 - 130				
Acetone	19.91	2.0	40	0	49.8	39 - 160				
Benzene	19.68	1.0	20	0	98.4	79 - 120				
Bromobenzene	21.64	1.0	20	0	108	80 - 120				
Bromochloromethane	17.62	1.0	20	0	88.1	78 - 123				
Bromodichloromethane	18.11	1.0	20	0	90.6	79 - 125				
Bromoform	17.87	1.0	20	0	89.4	66 - 130				
Bromomethane	9.649	1.0	20	0	48.2	53 - 141				S

ALS Houston, US

Date: 31-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP/Site 18/24
WorkOrder: HS19120844

QC BATCH REPORT

Batch ID: R352800 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MS	Sample ID: HS19120843-04MS	Units: UG/L			Analysis Date: 18-Dec-2019 15:00					
Client ID:	Run ID: VOA6_352800	SeqNo: 5400240	PrepDate:	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	32.22	2.0	40	0	80.6	64 - 133				
Carbon tetrachloride	18.3	1.0	20	0	91.5	72 - 136				
Chlorobenzene	19.75	1.0	20	0	98.7	82 - 118				
Chloroethane	11.1	1.0	20	0	55.5	60 - 138				S
Chloroform	17.4	1.0	20	0	87.0	79 - 124				
Chloromethane	5.644	1.0	20	0	28.2	50 - 139				S
cis-1,2-Dichloroethene	29.24	1.0	20	10.44	94.0	78 - 123				
cis-1,3-Dichloropropene	18.92	1.0	20	0	94.6	75 - 124				
Dibromochloromethane	19.14	1.0	20	0	95.7	74 - 126				
Dibromomethane	17.46	1.0	20	0	87.3	79 - 123				
Dichlorodifluoromethane	2.796	1.0	20	0	14.0	32 - 152				S
Ethylbenzene	20.99	1.0	20	0	105	79 - 121				
Hexachlorobutadiene	24.64	1.0	20	0	123	66 - 134				
Isopropylbenzene	20.88	1.0	20	0	104	72 - 131				
m,p-Xylene	41.15	2.0	40	0	103	80 - 121				
Methylene chloride	17.05	2.0	20	0	85.3	74 - 124				
Naphthalene	19.15	1.0	20	0	95.8	61 - 128				
n-Butylbenzene	22.43	1.0	20	0	112	75 - 128				
n-Propylbenzene	23.34	1.0	20	0	117	76 - 126				
o-Xylene	20.16	1.0	20	0	101	78 - 122				
sec-Butylbenzene	23.29	1.0	20	0	116	77 - 126				
Styrene	19.97	1.0	20	0	99.8	78 - 123				
tert-Butylbenzene	23.26	1.0	20	0	116	78 - 124				
Tetrachloroethene	20	1.0	20	0	100	74 - 129				
Toluene	20.73	1.0	20	0	104	80 - 121				
trans-1,2-Dichloroethene	18.32	1.0	20	0	91.6	75 - 124				
trans-1,3-Dichloropropene	18.08	1.0	20	0	90.4	73 - 127				
Trichloroethene	59.12	1.0	20	39.53	98.0	79 - 123				
Trichlorofluoromethane	12.16	1.0	20	0	60.8	65 - 141				S
Vinyl chloride	10.73	1.0	20	3.007	38.6	58 - 137				S
Surr: 1,2-Dichloroethane-d4	45.29	1.0	50	0	90.6	81 - 118				
Surr: 4-Bromofluorobenzene	49.02	1.0	50	0	98.0	85 - 114				
Surr: Dibromofluoromethane	46.59	1.0	50	0	93.2	80 - 119				
Surr: Toluene-d8	51.23	1.0	50	0	102	89 - 112				

ALS Houston, US

Date: 31-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP/Site 18/24
WorkOrder: HS19120844

QC BATCH REPORT

Batch ID: R352800 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MSD	Sample ID: HS19120843-04MSD	Units: UG/L			Analysis Date: 18-Dec-2019 15:24					
Client ID:	Run ID: VOA6_352800	SeqNo: 5400241	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	18.87	1.0	20	0	94.4	78 - 124	19.65	4.04	20	
1,1,1-Trichloroethane	17.82	1.0	20	0	89.1	74 - 131	18.16	1.87	20	
1,1,2,2-Tetrachloroethane	19.93	1.0	20	0	99.6	71 - 121	20.5	2.82	20	
1,1,2-Trichloroethane	19.38	1.0	20	0	96.9	80 - 119	19.52	0.74	20	
1,1-Dichloroethane	20.94	1.0	20	3.014	89.7	77 - 125	21.61	3.12	20	
1,1-Dichloroethene	14.15	1.0	20	0	70.8	71 - 131	14.36	1.45	20	S
1,1-Dichloropropene	19.03	1.0	20	0	95.1	78 - 125	19.43	2.07	20	
1,2,3-Trichlorobenzene	23.04	1.0	20	0	115	69 - 129	23.1	0.288	20	
1,2,3-Trichloropropane	20.52	1.0	20	0	103	73 - 122	21.01	2.35	20	
1,2,4-Trichlorobenzene	20.92	1.0	20	0	105	69 - 130	22.03	5.16	20	
1,2,4-Trimethylbenzene	21.48	1.0	20	0	107	76 - 124	22.53	4.78	20	
1,2-Dibromo-3-chloropropane	19.1	1.0	20	0	95.5	62 - 128	19.44	1.74	20	
1,2-Dibromoethane	18.54	1.0	20	0	92.7	77 - 121	18.67	0.717	20	
1,2-Dichlorobenzene	19.99	1.0	20	0	100.0	80 - 119	20.5	2.53	20	
1,2-Dichloroethane	17.2	1.0	20	0	86.0	73 - 128	17.54	1.97	20	
1,2-Dichloropropane	18.74	1.0	20	0	93.7	78 - 122	18.91	0.92	20	
1,3,5-Trimethylbenzene	22.32	1.0	20	0	112	75 - 124	23.05	3.23	20	
1,3-Dichlorobenzene	20.95	1.0	20	0	105	80 - 119	21.78	3.88	20	
1,3-Dichloropropane	19.09	1.0	20	0	95.4	80 - 119	19.64	2.85	20	
1,4-Dichlorobenzene	20.24	1.0	20	0	101	79 - 118	20.72	2.32	20	
2,2-Dichloropropane	17.66	1.0	20	0	88.3	60 - 139	18.12	2.59	20	
2-Butanone	32.67	2.0	40	0	81.7	56 - 143	32.03	2	20	
2-Chlorotoluene	22.49	1.0	20	0	112	79 - 122	23.54	4.56	20	
2-Hexanone	35.22	2.0	40	0	88.1	57 - 139	34.43	2.28	20	
4-Chlorotoluene	21.64	1.0	20	0	108	78 - 122	22.48	3.8	20	
4-Isopropyltoluene	22.16	1.0	20	0	111	77 - 127	22.68	2.34	20	
4-Methyl-2-pentanone	35.91	2.0	40	0	89.8	67 - 130	36.28	1.02	20	
Acetone	20.06	2.0	40	0	50.1	39 - 160	19.91	0.742	20	
Benzene	19.5	1.0	20	0	97.5	79 - 120	19.68	0.887	20	
Bromobenzene	20.71	1.0	20	0	104	80 - 120	21.64	4.4	20	
Bromochloromethane	17.66	1.0	20	0	88.3	78 - 123	17.62	0.213	20	
Bromodichloromethane	17.88	1.0	20	0	89.4	79 - 125	18.11	1.31	20	
Bromoform	17.89	1.0	20	0	89.4	66 - 130	17.87	0.0845	20	
Bromomethane	8.522	1.0	20	0	42.6	53 - 141	9.649	12.4	20	S

ALS Houston, US

Date: 31-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP/Site 18/24
WorkOrder: HS19120844

QC BATCH REPORT

Batch ID: R352800 (0)		Instrument: VOA6			Method: VOLATILES ORGANICS BY METHOD 8260C					
MSD	Sample ID: HS19120843-04MSD	Units: UG/L			Analysis Date: 18-Dec-2019 15:24					
Client ID:	Run ID: VOA6_352800	SeqNo: 5400241		PrepDate:		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	31.34	2.0	40	0	78.3	64 - 133	32.22	2.78	20	
Carbon tetrachloride	18	1.0	20	0	90.0	72 - 136	18.3	1.69	20	
Chlorobenzene	18.96	1.0	20	0	94.8	82 - 118	19.75	4.04	20	
Chloroethane	10.86	1.0	20	0	54.3	60 - 138	11.1	2.26	20	S
Chloroform	17.23	1.0	20	0	86.2	79 - 124	17.4	0.934	20	
Chloromethane	5.204	1.0	20	0	26.0	50 - 139	5.644	8.12	20	S
cis-1,2-Dichloroethene	28.77	1.0	20	10.44	91.7	78 - 123	29.24	1.61	20	
cis-1,3-Dichloropropene	18.87	1.0	20	0	94.3	75 - 124	18.92	0.258	20	
Dibromochloromethane	18.67	1.0	20	0	93.3	74 - 126	19.14	2.53	20	
Dibromomethane	17.43	1.0	20	0	87.1	79 - 123	17.46	0.18	20	
Dichlorodifluoromethane	2.753	1.0	20	0	13.8	32 - 152	2.796	1.55	20	S
Ethylbenzene	19.88	1.0	20	0	99.4	79 - 121	20.99	5.39	20	
Hexachlorobutadiene	21.88	1.0	20	0	109	66 - 134	24.64	11.8	20	
Isopropylbenzene	19.98	1.0	20	0	99.9	72 - 131	20.88	4.4	20	
m,p-Xylene	40.19	2.0	40	0	100	80 - 121	41.15	2.36	20	
Methylene chloride	16.82	2.0	20	0	84.1	74 - 124	17.05	1.39	20	
Naphthalene	19.52	1.0	20	0	97.6	61 - 128	19.15	1.92	20	
n-Butylbenzene	22.01	1.0	20	0	110	75 - 128	22.43	1.91	20	
n-Propylbenzene	22.46	1.0	20	0	112	76 - 126	23.34	3.82	20	
o-Xylene	19.26	1.0	20	0	96.3	78 - 122	20.16	4.59	20	
sec-Butylbenzene	22.44	1.0	20	0	112	77 - 126	23.29	3.7	20	
Styrene	19.35	1.0	20	0	96.7	78 - 123	19.97	3.17	20	
tert-Butylbenzene	22.27	1.0	20	0	111	78 - 124	23.26	4.33	20	
Tetrachloroethene	19.11	1.0	20	0	95.5	74 - 129	20	4.6	20	
Toluene	19.96	1.0	20	0	99.8	80 - 121	20.73	3.79	20	
trans-1,2-Dichloroethene	18.21	1.0	20	0	91.0	75 - 124	18.32	0.603	20	
trans-1,3-Dichloropropene	18.01	1.0	20	0	90.0	73 - 127	18.08	0.402	20	
Trichloroethene	58.33	1.0	20	39.53	94.0	79 - 123	59.12	1.34	20	
Trichlorofluoromethane	11.92	1.0	20	0	59.6	65 - 141	12.16	1.95	20	S
Vinyl chloride	10.48	1.0	20	3.007	37.4	58 - 137	10.73	2.33	20	S
Surr: 1,2-Dichloroethane-d4	45.17	1.0	50	0	90.3	81 - 118	45.29	0.275	20	
Surr: 4-Bromofluorobenzene	50.31	1.0	50	0	101	85 - 114	49.02	2.6	20	
Surr: Dibromofluoromethane	46.44	1.0	50	0	92.9	80 - 119	46.59	0.324	20	
Surr: Toluene-d8	50.11	1.0	50	0	100	89 - 112	51.23	2.21	20	

ALS Houston, US

Date: 31-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP/Site 18/24
WorkOrder: HS19120844

QC BATCH REPORT**Batch ID:** R352800 (0)**Instrument:** VOA6**Method:** VOLATILES ORGANICS BY METHOD
8260C

The following samples were analyzed in this batch:

HS19120844-01

HS19120844-02

HS19120844-03

HS19120844-05

ALS Houston, US

Date: 31-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP/Site 18/24
WorkOrder: HS19120844

**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 Quantitation 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	19-028-0	27-Mar-2020
California	2919, 2019-2020	30-Apr-2020
Dept of Defense	ANAB L2231	20-Dec-2021
Florida	E87611-28	30-Jun-2020
Illinois	2000322019-2	09-May-2020
Kansas	E-10352 2019-2020	31-Jul-2020
Kentucky	123043, 2019-2020	30-Apr-2020
Louisiana	03087, 2019-2020	30-Jun-2020
Maryland	343, 2019-2020	30-Jun-2020
North Dakota	R-193 2019-2020	30-Apr-2020
Oklahoma	2019-067	31-Aug-2020
Texas	TX104704231-19-23	30-Apr-2020

Sample Receipt Checklist

Client Name: Bhate Environmental
 Work Order: HS19120844

Date/Time Received: **14-Dec-2019 09:30**
 Received by: **JRM**

Checklist completed by: Paresh M. Giga 16-Dec-2019
 eSignature Date

Reviewed by: RJ Modashia 17-Dec-2019
 eSignature Date

Matrices: **GW/Water**

Carrier name: **FedEx**

- 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 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):

Cooler(s)/Kit(s):

Date/Time sample(s) sent to storage:

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:



1608 13th Avenue South, Suite 300
 Birmingham Alabama 35205
 Tel: 205-918-4000
 Fax: 205-918-4050

Chain of Custody and Analytical Request

Project/Phase No: NWO1312.0150

COC Number(1): _____

LIMS Number: HS19120844

Facility/Base I.D.: LHAAP							Sample Analysis Requested ⁽⁵⁾											Quality Assurance Samples ⁽⁶⁾			Cooler ID										
Project/Site Name: LHAAP / Site 18/24							Number of containers	VOC	PERCHLORATE	TOTAL METALS	1, 4 - DIOXANE												Ambient Blank Lot Control Number	Equipment Blank Lot Control Number	Trip Blank Lot Control Number						
Client Name:																															
Collected by: Scott Beesinger																															
Field Sample ID (30 Characters Max)	Date Collected (dd-mm-yyyy)	Time Collected (Military) (hhmm)	Sample Depth (beginning - ending)	SA Code ⁽²⁾	Sample Number ⁽³⁾	Sample Matrix ⁽⁴⁾																									
MW2 - 121319	13Dec2019	0810	-	N		WG	6	3	1	1	1																				
MW2 - 121319-a	13Dec2019	0810	-	FD		WG	6	3	1	1	1																				
18LPTMW01SW - 121319	13Dec2019	0935	-	N		WG	6	3	1	1	1																				
AWDL - 121319	13Dec2019	1050	-	N		WG	3		1	1	1																				
Trip Blank	13Dec2019			TB		W	2	2																							

HS19120844
 Bhate Environmental Associates, Inc.
 LHAAP/Site 18/24




COMMENTS: _____

Relinquished By (Signed) _____ Date _____ Time _____				Received by (signed) _____ Date _____ Time _____				Sample Delivery Details / Laboratory Receipt			
1. <u>Anna Marie</u>	<u>12/13/19</u>	<u>1145</u>		1. <u>S. M...</u>	<u>12/14/19</u>	<u>09:30</u>		Delivered Directly to Lab: _____	Shipped _____	No.:	
2. _____				2. _____				Method of Shipment: _____			
3. _____				3. _____				Fed _____ Ex _____ Airbill _____	Number:		
								Analytical Lab: <u>ALS 10450 Stansliff Rd. Suite 210 Houston, TX 77099 (281) 530-5656</u>			
								ATTN: <u>SONIA WEST</u> 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 (ddmmmy) 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 - 45043
 Temp 2.5
 12/11
 CFOJ*

 ALS 10450 Stancliff Rd., Suite 210 Houston, Texas 77099 Tel. +1 281 530 5656 Fax. +1 281 530 5887	CUSTODY SEAL		Seal Broken By:
	Date: 12/13/19	Time: 12:00	SM
	Name: Scott Beesinger	Company: BHATZ	Date: 12/14/19

45043 DEC 14 2019

Must Deliver Next Business Day
Time and Temperature Sensitive!



45043

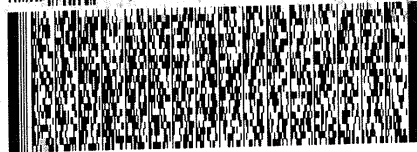
ORIGIN ID: SGRA (903) 930-6193
 SCOTT BEESINGER
 BHATE ENVIRONMENTAL ASSOCIATES
 1203-B EAST GRAND AVE. PMB202
 MARSHALL, TX 75670
 UNITED STATES US

SHIP DATE: 02DEC19
 ACTWGT: 1.00 LB MAN
 CAD: 300130/CAFE3211
 DIMS: 26x14x14 IN

TO **CLIENT SERVICES**
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON TX 77099

(281) 530-5856
 REF: LHAAP-18/24-BO 68900-RJ

RMA: ||| ||| |||



RETURNS MON-SAT
PRIORITY OVERNIGHT
SATURDAY 12:00P
PRIORITY OVERNIGHT

FedEx
 TRACKING
 1251 0292 4140

X0 SGRA

77099
 TX-US
IAH



FTD 162785 13DEC19 G6GA 56AC2/1800/05A2



Case Narrative

Method: 6850
Analysis: Perchlorate
Analysis SOP: LC-MS-CLO4
ALS WO ID(s): 1934851; 1935316; 1935343

Client: ALS Laboratories (Houston, TX)
Matrix: Water
ELMS Batch (HBN): 2330 (254116)

General Set Information: There were seventeen field samples in these Work Orders. The samples were analyzed for perchlorate.

Method Summary: Each sample was prepared as noted below and analyzed using an Agilent 1100 LC/MSD system in select ion monitoring (SIM) mode at m/z 83 and 85, which corresponds to the loss of one oxygen atom from the perchlorate molecule. ChemStation software was used for instrument control and data analysis. The ion ratio of m/z 83 to 85 was used to positively identify the response peak as perchlorate. Quantitation was performed using the m/z 83 peak area. An internal standard (ISTD) of ^{18}O labeled perchlorate was added to each sample to establish the perchlorate peak retention time and used in quantitation.

Sample Preparation: A 10.0mL aliquot of each sample was transferred into a 15-mL centrifuge tube. 50 μL of an ^{18}O labeled perchlorate solution was added to each sample as an internal standard. The samples were then capped, vortexed, and filtered into autosampler vial using Phenex PES membrane 0.45 μm Syringe filters.

Holding Times: Holding times were met for all analyses.

Dilutions: Field sample 1934851007 was analyzed and reported from a 1:100 dilution. Field sample 1935343005 was analyzed and reported from a 1:10 dilution. Field samples 1935343004/06 were analyzed and reported from 1:1,000 dilutions. The reporting limits have been adjusted accordingly.

Method QC data: The method blank (LMB 689411) was less than 1/2 the CRDL. The recovery for the LCS (689408) was within acceptable parameters.



MS/MSD Analysis: MS/MSD was performed on sample 1934851001 (Client ID: MW19_120919). 3.0 μ L of Working Standard Solution Horizon ID 49947 was added to 10.0mL of sample preparation. The spike target was 3. μ g/L. The MS/MSD percent recoveries and relative percent difference (RPD) were within the performance limits.

Instrument QC: Instrument initial and continuing calibrations were performed in accordance with published procedures.

NC/CAR(s): NA

Sample Calculation: Samples were reported in μ g/L. Results were calculated in μ g/L by the equation (A)x(B),

where: A = Analyte concentration from the standard curve (μ g/L)

B = Dilution performed at time of analysis

Miscellaneous Comments: These samples were analyzed in accordance with the requirements found in the DOD QSM Version 5.1.1. The Reporting Limit Verification Standard (RLVS – 689409) is reported from the analysis of the Laboratory Control Sample (LCS – 689408) at a level of 3.0 μ g/L. Due to limitations of the Chemstation Software, some of the chromatographic peaks may require manual integrations. A manual integration was performed for one of the Initial Calibration analyses (datafile: 20SEPI03) along with datafiles 20DEC19D14/16/18/19.

Thomas Bosch December 23, 2019
Analyst Date



ANALYTICAL REPORT

Report Date: December 23, 2019

RJ Modashia
ALS Environmental (Houston)
10450 Stancliff Road
Suite 210
Houston, TX 77099

Phone: 281 530-5656

E-mail: RJ.Modashia@ALSGlobal.com

Workorder: **34-1935316**

Project ID: HS19120844

Purchase Order: HS19120844

Project Manager Kevin W. Griffiths

Client Sample ID	Lab ID	Collect Date	Receive Date	Sampling Site
MW2_121319	1935316001	12/13/19	12/17/19	
MW2_121319_a	1935316002	12/13/19	12/17/19	
18CPTMW01SW_121319	1935316003	12/13/19	12/17/19	
AWD1_121319	1935316004	12/13/19	12/17/19	



ANALYTICAL REPORT

Workorder: 34-1935316

Client: ALS Environmental
(Houston)

Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: MW2_121319	Sampling Site: NA	Collected: 12/13/2019				
Lab ID: 1935316001	Media: 125 mL Nalgene	Received: 12/17/2019				
Matrix: Water	Sampling Parameter: NA					
Analysis Method - EPA 6850, DoD QSM						
Preparation: Not Applicable	Analysis: EPA 6850, DoD QSM Water Batch: ELMS/2330 (HBN: 254116) Analyzed: 12/20/2019 16:20	Instrument ID: LCMS04 %Solids: NA Report Basis: Wet				
Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Sample ID: MW2_121319_a	Sampling Site: NA	Collected: 12/13/2019				
Lab ID: 1935316002	Media: 125 mL Nalgene	Received: 12/17/2019				
Matrix: Water	Sampling Parameter: NA					
Analysis Method - EPA 6850, DoD QSM						
Preparation: Not Applicable	Analysis: EPA 6850, DoD QSM Water Batch: ELMS/2330 (HBN: 254116) Analyzed: 12/20/2019 16:48	Instrument ID: LCMS04 %Solids: NA Report Basis: Wet				
Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Sample ID: 18CPTMW01SW_121319	Sampling Site: NA	Collected: 12/13/2019				
Lab ID: 1935316003	Media: 125 mL Nalgene	Received: 12/17/2019				
Matrix: Water	Sampling Parameter: NA					
Analysis Method - EPA 6850, DoD QSM						
Preparation: Not Applicable	Analysis: EPA 6850, DoD QSM Water Batch: ELMS/2330 (HBN: 254116) Analyzed: 12/20/2019 17:02	Instrument ID: LCMS04 %Solids: NA Report Basis: Wet				
Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Sample ID: AWD1_121319	Sampling Site: NA	Collected: 12/13/2019				
Lab ID: 1935316004	Media: 125 mL Nalgene	Received: 12/17/2019				
Matrix: Water	Sampling Parameter: NA					
Analysis Method - EPA 6850, DoD QSM						
Preparation: Not Applicable	Analysis: EPA 6850, DoD QSM Water Batch: ELMS/2330 (HBN: 254116) Analyzed: 12/20/2019 17:16	Instrument ID: LCMS04 %Solids: NA Report Basis: Wet				
Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	1.4	1.0	2.0	4.0	1	J



ANALYTICAL REPORT

Workorder: 34-1935316

Client: ALS Environmental
(Houston)

Project Manager: Kevin W. Griffiths

Comments

Quality Control: EPA 6850, DoD QSM - (HBN: 254116)

Field sample 1934851007 was analyzed and reported from a 1:100 dilution. Field sample 1935343005 was analyzed and reported from a 1:10 dilution. Field samples 1935343004/06 were analyzed and reported from 1:1,000 dilutions. The reporting limits have been adjusted accordingly.

Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Method	Analyst	Peer Review
EPA 6850, DoD QSM	/S/ Thomas Bosch 12/23/2019 10:15	/S/ Stephen Brose 12/23/2019 13:19

Laboratory Contact Information

ALS Environmental
960 W Levoy Drive
Salt Lake City, Utah 84123

Phone: (801) 266-7700
Email: als@alst.com
Web: www.alst.com

General Lab Comments

The results provided in this report relate only to the items tested.
Samples were received in acceptable condition unless otherwise noted.
Samples have not been blank corrected unless otherwise noted.
This test report shall not be reproduced, except in full, without written approval of ALS.

ALS provides professional analytical services for all samples submitted. ALS is not in a position to interpret the data and assumes no responsibility for the quality of the samples submitted.

All quality control samples processed with the samples in this report yielded acceptable results unless otherwise noted.

ALS is accredited for specific fields of testing (scopes) in the following testing sectors. The quality system implemented at ALS conforms to accreditation requirements and is applied to all analytical testing performed by ALS. The following table lists testing sector, accreditation body, accreditation number and website. Please contact these accrediting bodies or your ALS project manager for the current scope of accreditation that applies to your analytical testing.

Testing Sector	Accreditation Body (Standard)	Certificate Number	Website
Environmental	PJLA (DoD ELAP)	L17-506	http://www.pjllabs.com
	PJLA (ISO 17025)	L17-507-R1	http://www.pjllabs.com
	Utah (TNI)	UT00953	http://lams.nelac-institute.org/search
	Iowa (TNI)	IA# 376	http://www.shl.uiowa.edu/labcert/idnr/
	Kansas	E-10416	http://www.kdheks.gov/envlab/disclaimer.html
Industrial Hygiene	AIHA (ISO 17025 & AIHA IHLAP)	101574	http://www.aihaaccreditedlabs.org
	DOECAP-AP	L18-606	http://www.pjllabs.com
	Washington	C596	https://ecology.wa.gov/Regulations-Permits/Permits-certifications/Laboratory-Accreditation
Dietary Supplements	PJLA (ISO 17025)	L17-507-R1	http://www.pjllabs.com



ANALYTICAL REPORT

Workorder: 34-1935316

Client: ALS Environmental
(Houston)

Project Manager: Kevin W. Griffiths

Result Symbol Definitions

MDL = Method Detection Limit, a statistical estimate of method/media/instrument sensitivity.

RL = Reporting Limit, a verified value of method/media/instrument sensitivity.

CRDL = Contract Required Detection Limit

Reg. Limit = Regulatory Limit.

ND = Not Detected, testing result not detected above the MDL or RL.

< Means this testing result is less than the numerical value.

** No result could be reported, see sample comments for details.

Qualifier Symbol Definitions

U = Qualifier indicates that the analyte was not detected above the MDL.

J = Qualifier Indicates that the analyte value is between the MDL and the RL. It is also used to indicate an estimated value for tentatively identified compounds in mass spectrometry where a 1:1 response is assumed.

B = Qualifier indicates that the analyte was detected in the blank.

E = Qualifier indicates that the analyte result exceeds calibration range.

P = Qualifier indicates that the RPD between the two columns is greater than 40%.



Quality Control Sample Batch Report

00958482

Analysis Information

Workorder: 1935316

Limits: Client SOW/Contract Specified
Basis: DoD QSM

Preparation: NA
Batch: NA
Prepared By: NA

Analysis: EPA 6850, DoD QSM
Batch: ELMS/2330 (HBN: 254116)
Analyzed By: Thomas Bosch

Blank

LMB: 689411 Analyzed: 12/20/2019 14:02 Units: ug/L			
Analyte	Result	MDL	RL
Perchlorate	ND	1	2.00

Laboratory Control Sample

LCS: 689408 Analyzed: 12/20/2019 13:34 Dilution: 1 Units: ug/L				
Analyte	Result	Target	% Rec	QC Limits
Perchlorate	3.31	3.00	110	78.8 123.8

Matrix Spike - Matrix Spike Duplicate

Sample: 1934851001 Analyzed: 12/20/2019 14:15 Dilution: 1 Units: ug/L			MS: 689412 Analyzed: 12/20/2019 14:29 Dilution: 1 Units: ug/L				MSD: 689413 Analyzed: 12/20/2019 14:43 Dilution: 1 Units: ug/L			
Analyte	Result	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits	
Perchlorate	ND	2.84	3	94.6	78.8 123.8	2.81	93.7	0.934	0.0 20.0	

Comments

Field sample 1934851007 was analyzed and reported from a 1:100 dilution. Field sample 1935343005 was analyzed and reported from a 1:10 dilution. Field samples 1935343004/06 were analyzed and reported from 1:1,000 dilutions. The reporting limits have been adjusted accordingly.

QC Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Analyst	Peer Review
/S/ Thomas Bosch 12/23/2019 10:57	/S/ Stephen Brose 12/23/2019 13:19

Symbols and Definitions

- * - Analyte above reporting limit or outside of control limits
- ▲ - Sample result is greater than 4 times the spike added
- ⊖ - Sample and Matrix Duplicate less than 5 times the reporting limit
- - Result is above the calibration range
- # - The Matrix Spike, Matrix Spike duplicate or Matrix Duplicate is reported for your information only. The sample matrix may be inappropriate for the method selected.

- RPD - Relative % Difference (Spike / Spike Duplicate)
- ND - Not Detected (U - Qualifier also flags analyte as not detected)
- NA - Not Applicable
- QC results are not adjusted for moisture correction, where applicable



1935316

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

18698/#2

SAMPLING STATE: Texas

COC ID: 12869

SUBCONTRACT TO:

ALS Laboratory Group
960 LeVoy Dr
Salt Lake City, UT 84123

Phone: +1 801 266 7700

1935316

CUSTOMER INFORMATION:

Company: ALS Houston
Contact: RJ Modashia
Address: 10450 Stancliff Rd, Ste 210
Phone: +1 281 530 5656
Email: RJ.Modashia@alsglobal.com
Alternate Contact:
Email:

INVOICE INFORMATION:

Company: ALS Houston
Contact: Accounts Payable
Address: 10450 Stancliff Rd, Ste 210
Phone: +1 281 530 5656
Reference: HS19120844
TSR: Danielle Winnings

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	HS19120844-01	MW2_121319	Groundwater	13 Dec 2019 08:10
	SUB_Perch-6850			24 Dec 2019
2.	HS19120844-02	MW2_121319_a	Groundwater	13 Dec 2019 08:10
	SUB_Perch-6850			24 Dec 2019
3.	HS19120844-03	18CpTMW01SW_121319	Groundwater	13 Dec 2019 09:35
	SUB_Perch-6850			24 Dec 2019
4.	HS19120844-04	AWD1_121319	Groundwater	13 Dec 2019 10:50
	SUB_Perch-6850			24 Dec 2019

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

QC Level: DOD IV (DoD Data Package)

Relinquished By:

[Signature]

Date/Time:

12/11/19 1800.

Received By:

[Signature]

Date/Time:

12/11/19 9:00

Cooler ID(s):

Temperature(s):

2



ALS Environmental

CHAIN-OF-CUSTODY

Project / Job / Task: HS19120844		Split:		Workorder ID: 1935316		Level: ENV_LVL4	
Client: ALS Environmental (Houston)		Account: 8101		Requested Analysis		Requested Analysis	
Comments:							
Item	Collect Date/Time	Sample ID	Lab ID	QC	Matrix	ID(s)	Count
1	12/13/2019 08:10	MW2_121319	1935316001		Water	A	1
2	12/13/2019 08:10	MW2_121319_a	1935316002		Water	A	1
3	12/13/2019 09:35	18CPTMW01SW_121319	1935316003		Water	A	1
4	12/13/2019 10:50	AWD1_121319	1935316004		Water	A	1
5							
6							
7							
8							
9							
10							

ORIGINAL FIELD SAMPLE CHAIN-OF-CUSTODY					SAMPLE PREPARATION / ANALYSIS CHAIN-OF-CUSTODY					
Relinquished By: (Signature)		Date / Time	Received By: (Signature)		Date / Time	Relinquished By: (Signature)		Date / Time	Received By: (Signature)	
Wendell, Julie		12/17/2019 09:06	ALS Sample Receiving			Sample Login			Reason for Transfer / Storage Location	
<i>Julie Wendell</i>		12/19/19 1400	WOC			stage			Reason for Transfer / Storage Location	
R-33-1		12/20/19/08:45	T. Bush			copy analysis			Reason for Transfer / Storage Location	

ALS-SALT LAKE CITY-RELATED INFORMATION REPORT (CRIR)

COOLER OR CONTAINER INFORMATION CHECKLIST (Fill In or Circle)

Client Name: <u>ALS Houston</u>		Project/Task/Site: _____						
Date/Time of Receipt: <u>2/17/19 900</u>		Number of Coolers Received: <u>1 1935316</u>						
Condition of Coolers: <u>Acceptable/Unacceptable</u>		Temperature Control: <u>Present/Not Included</u>						
Cooler Custody Seals: <u>Present/Absent/NA</u>		Location Temp Taken: <u>Control/Between Samples</u>						
Container Custody Seals: <u>Present/Absent/NA</u>		Are all temperatures within project specific guidelines? <u>Yes/No/NA</u>						
Ice Present: <u>Frozen/Melted/NA</u>		VOA Headspace Present? <u>Yes/No/NA</u>						
pH Check Performed:	Metals <u>Yes/No/NA</u>	Total Phenolics <u>Yes/No/NA</u>	NO3/NO2 <u>Yes/No/NA</u>					
	Cyanide <u>Yes/No/NA</u>	TPH - 418.1 <u>Yes/No/NA</u>	Oil & Grease <u>Yes/No/NA</u>					
	Sulfide <u>Yes/No/NA</u>	COD <u>Yes/No/NA</u>	Total Phosphorous <u>Yes/No/NA</u>					
	Ammonia <u>Yes/No/NA</u>	TKN <u>Yes/No/NA</u>	Gross A.B, Gamma Spec <u>Yes/No/NA</u>					
Cooler Received	Cooler Condition	Temp.	Cooler Received	Cooler Condition	Temp.	Cooler Received	Cooler Condition	Temp.
1	<u>good</u>	<u>2</u> °C	4		°C	7		°C
2		°C	5		°C	8		°C
3		°C			°C	9		°C
Taken By: <u>[Signature]</u>		Printed Name: <u>Naveed K. Edmonds</u>		Date: <u>2/17/19</u>				

CLIENT-RELATED INFORMATION

<input type="checkbox"/> Missing Cooler	<input type="checkbox"/> Missing Samples/Bottles	<input type="checkbox"/> Incorrect Preservation	<input type="checkbox"/> Insufficient Sample Volume
<input type="checkbox"/> Cooler Conditions	<input type="checkbox"/> Broken/Leaking Samples	<input type="checkbox"/> pH Criteria Not Met	<input type="checkbox"/> Chain of Custody Problems
<input type="checkbox"/> Missing Paperwork	<input type="checkbox"/> Incorrect Bottle Type	<input type="checkbox"/> Residual Chlorine Present	<input type="checkbox"/> Other:
<input type="checkbox"/> Missing/Incorrect Bottle Labels	<input type="checkbox"/> Cooler Temperatures Out of Range	<input type="checkbox"/> Head Space in Bottles	

BRIEFLY DESCRIBE THE PROBLEM AND THE ACTION TAKEN:

Client Notified? YES NO

Response Required Within 24 Hours

PROJECT MANAGEMENT

PROJECT MANAGER COMMENTS:

ALS Project Manager: _____ Returned to Sample Receipt by: _____ Date: _____
Printed Name Signature

Must Deliver Next Business Day
Time and Temperature Sensitive!



ORIGIN ID: SGRA (281) 530-5656
CLIENT SERVICES
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON, TX 77099
UNITED STATES US

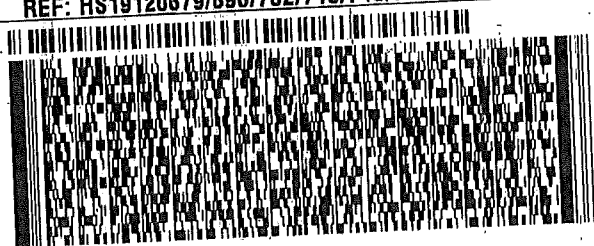
SHIP DATE: 16DEC19
ACTWGT: 47.30 LB
CAD: 300130/CAFE3211
DIMS: 28x14x14 IN
BILL THIRD PARTY

TO **SAMPLE RECEIVING
ALS ENVIRONMENTAL
960 W. LEVOY DRIVE**

SALT LAKE CITY UT 84123

(801) 288-7700

REF: HS19120679/696/702/715/745/765/843/844 -



**FedEx
Express**



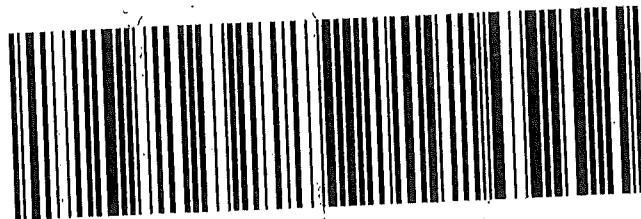
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TRK# 1251 0292 9451
0201

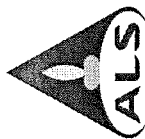
**TUE - 17 DEC 3:00P
STANDARD OVERNIGHT**

AX BTFA

**84123
UT-US SLC**



5512/1800/104C



Batch Worklist

HBN: 254116

Instrument:

Created: 12/20/2019 13:12

Batch: ELMS/2330



Status: WP

Analyst: T. Bosch

Rule: EPA 6850, DoD QSM Water

Workorder: 1934851 [ENV_LVL4]

Workorder: 1935316 [ENV_LVL4]

Workorder: 1935343 [ENV_LVL4]

Pos	Lab ID	Sample ID	Prep Initial	Prep Final	Dust Weight	Type	Mx	Container	Procedure	Mgr	Expire Date	Due Date	Run Date
1	689407	CCV for HBN 254116 [ELMS/2330]				CCV	3		E685041C3Q	5311		12/27/2019	
2	689408	LCS for HBN 254116 [ELMS/2330]				LCS	3		E6850Q413Q	5311		12/27/2019	
3	689409	RLVS for HBN 254116 [ELMS/2330]				RLVS	3		E685041C3Q	5311		12/27/2019	
4	689410	ICS for HBN 254116 [ELMS/2330]				ICS	3		E6850.D3Q	5311		12/27/2019	
5	689411	LMB for HBN 254116 [ELMS/2330]				LMB	3		E6850Q413Q	5311		12/27/2019	
6	1934851001	MW19_120919				SAMPLE	3	1934851001-A	E6850Q41.3	5480	1/6/2020	12/27/2019	
7	689412	MW19_120919(1934851001MS)				MS	3		E6850Q413Q	5311		12/27/2019	
8	689413	MW19_120919(1934851001MSD)				MSD	3		E6850Q413Q	5311		12/27/2019	
9	1934851002	18WW10_120919				SAMPLE	3	1934851002-A	E6850Q41.3	5480	1/6/2020	12/27/2019	
10	1934851003	18WW06_120919				SAMPLE	3	1934851003-A	E6850Q41.3	5480	1/6/2020	12/27/2019	
11	1934851004	18WW02_120919				SAMPLE	3	1934851004-A	E6850Q41.3	5480	1/6/2020	12/27/2019	
12	1934851005	MW16_120919				SAMPLE	3	1934851005-A	E6850Q41.3	5480	1/6/2020	12/27/2019	
13	1934851006	18CPTMW23_120919				SAMPLE	3	1934851006-A	E6850Q41.3	5480	1/6/2020	12/27/2019	
14	1934851007	18CPTMW14_120919				SAMPLE	3	1934851007-A	E6850Q41.3	5480	1/6/2020	12/27/2019	
15	1935316001	MW2_121319				SAMPLE	3	1935316001-A	E6850Q41.3	5480	1/10/2020	12/31/2019	
16	689414	CCV for HBN 254116 [ELMS/2330]				CCV	3		E685041C3Q	5311		12/27/2019	
17	1935316002	MW2_121319_a				SAMPLE	3	1935316002-A	E6850Q41.3	5480	1/10/2020	12/31/2019	
18	1935316003	18CPTMW01SW_121319				SAMPLE	3	1935316003-A	E6850Q41.3	5480	1/10/2020	12/31/2019	
19	1935316004	AWD1_121319				SAMPLE	3	1935316004-A	E6850Q41.3	5480	1/10/2020	12/31/2019	
20	1935343001	18CpTMW16_121319				SAMPLE	3	1935343001-A	E6850Q41.3	5480	1/10/2020	12/31/2019	
21	1935343002	AWD3_121319				SAMPLE	3	1935343002-A	E6850Q41.3	5480	1/10/2020	12/31/2019	
22	1935343003	AWD3_121319_a				SAMPLE	3	1935343003-A	E6850Q41.3	5480	1/10/2020	12/31/2019	
23	1935343004	MW5_121319				SAMPLE	3	1935343004-A	E6850Q41.3	5480	1/10/2020	12/31/2019	
24	1935343005	18CpTMW08DW_121319				SAMPLE	3	1935343005-A	E6850Q41.3	5480	1/10/2020	12/31/2019	
25	1935343006	18CpTMW08SW_121319				SAMPLE	3	1935343006-A	E6850Q41.3	5480	1/10/2020	12/31/2019	
26	689415	CCV for HBN 254116 [ELMS/2330]				CCV	3		E685041C3Q	5311		12/27/2019	



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Analytical Documentation

Analyst Write-upALS Work Order #'s & Sample #(')s: 1934851 (001-07); 1935316 (001-04); 1935343 (001-06)ELMS Batch/HBN ID: 2330 (254116)Prep Date: 12/19/2019 Analysis Date: 12/20/2019 Analyst: Tom BoschAnalyte: **Perchlorate** Matrix: **Water** Method: **6850**Sequence: \\HPCHEM\1\SEQUENCE\CLO4\2019\DEC\20DEC19D.sReported DL: **1.0µg/L** Reported LOD: **2.0µg/L** Reported LOQ: **4.0µg/L**SAMPLE PREPARATION/ANALYSIS:

Water: Samples were prepared by Tom Bosch. 10.0mL of each sample was pipetted into a 15-mL centrifuge tube, and 50µL of an oxygen-18 labeled perchlorate solution was added as an internal standard. The samples were capped, vortexed, and filtered with Phenex PES membrane 0.45µm Syringe filters prior to analysis.

REAGENTS: Eluent A1: 95% ASTM Type II water (ALS)/5%ACN (B&J Lot DU461-US)/0.1% glacial acetic acid (JT-Baker Lot 122550).
Eluent B1: 95% ACN (B&J Lot DU461-US)/5% ASTM Type II water (ALS)/0.1% glacial acetic acid (JT-Baker Lot 122550).

STANDARDS: Internal Standard Spiking Solution Horizon# 47863. Dilutions of Working Standards (Horizon: 49947/48) used for ICAL, CCV's, RLVS and ICS.

CALIBRATION CURVE: Used curve from 09/20/2019, sequence 20SEP19D.s Offline Quantitation Method: CLO4-DP3.M

INSTRUMENT CONDITIONS: Samples were analyzed with an Agilent 1100 LC/MSD system, in negative SIM mode, monitoring m/z 83, 85, and 89.

Instrument ID: LCMS04 Online Acquisition Method: CLO4-AQN.M Fragmentor: 160 Output Gain: 8 Injection Volume: 35µL
Column: KP-RPPX C8 separator, 250mm Mobile Phase: 70% Eluent A1; 30% Eluent B1 Run time: 12.0min.

FLOW GRADIENT:

Time (min.)	Flow (mL/min)
0	0.65
5.8	0.65
5.9	0.25
10.3	0.25
10.5	0.65
12.0	0.65

QC DATA: 3.0µL of QC Solution Horizon ID 47516 was used for LCS 689408; Target = 3.0µg/L. ASTM type II water was used for LMB 689411.

MS/MSD: The Matrix Spike and duplicate (MS/MSD) was performed on sample 1934851001 (Client ID's: MW19_120919). 3.0µl of Working Standard Solution Horizon ID 49947 was added to 10.0mL of sample preparation. Spike target = 3.0µg/L.

COMMENTS:

- 1) Results reported in µg/L. Field sample 1934851007 was analyzed and reported from a 1:100 dilution. Field sample 1935343005 was analyzed and reported from a 1:10 dilution. Field samples 1935343004/06 were analyzed and reported from 1:1,000 dilutions. The reporting limits have been adjusted accordingly.
- 2) All QC, Blank, CCV, and MS/MSD results were within method parameters.
- 3) Sample data can be viewed at two directories within the ALS system: \\ALSLTWS013\LCMS\LCMS04\2019\DEC\HBN# or through NuGenesis\Tree\PrintData\LCMS\DefaultView.
- 4) Notebook: \\alsltws013\ORGANIC\BOSCH\LCMS\Perchlorates\Waters\2019\254116-DoD-ALS-Hstn LCMS4 or through \\ALSLTWS013\DATA\REVIEW\HBN#
- 5) The Reporting Limit Verification Standard (RLVS – 689409) is reported from the analysis of the Laboratory Control Sample (LCS – 689408) at a level of 3.0µg/L.
- 6) Due to limitations of the Chemstation Software, some of the chromatographic peaks require manual integration. Manual Integrations were performed for one of the Initial Calibration analyses (datafile: 20SEPI03) along with datafile 20DEC19D14/16/18/19.

5.5 Chromatography (GC, HPLC and LC/MS) Technical Review

Note: It is the peer reviewer's responsibility to ensure that appropriate criteria are used as defined in the HORIZON PROFILE. The evaluation criteria are prioritized as per Section 2.2 of this SOP. These items must be checked for all projects. The following checklist will be completed by both the analyst and the peer reviewer and scanned into the HBN folder with the raw data.

Chromatography (GC, HPLC, LC/MS) Technical Review Criteria	Analyst Initials	Reviewer Initials
Batch(es)/SDG: <u>ELMS: 2330 HBN: 254116</u>		
Sample Set IDs if Applicable: <u>1934851 / 1935316 / 1935343</u>		
<u>Sample positions on autosampler verified against instrument sequence</u>	TB	NA
Calibration standards analyzed and meets criteria	TB	SB
Standards traceability checked and meets criteria	TB	SB
Standard curve coefficients evaluated and meet criteria	TB	SB
ICVs analyzed and meet acceptance criteria	TB	SB
CCVs analyzed and meet acceptance criteria	TB	SB
Retention Time Windows checked	TB	SB
For method 8081A, Endrin/DDT Breakdown is checked for compliance	—	—
Surrogate recoveries checked and appropriately addressed	—	—
Method Preparation Blanks analyzed and meet acceptance criteria	TB	SB
MSs, MSDs, and/or MDs analyzed and calculations checked; applicable	TB	SB
RLVS analyzed	TB	SB
Preparation and analysis hold times met	TB	SB
Preparation deviations and re-preparations noted when performed	TB	SB
Analysis deviations and re-analyses noted when performed	TB	SB
Sample dilution factors noted on reports	TB	SB
Electronic records in HBN transcription accuracy and completeness	TB	SB
Preparation and analysis calculations checked	TB	SB
NCRs are completed as necessary NC/CAR# _____	TB	SB
Report forms are complete and accurate	TB	SB
Manual integrations checked	TB	SB



STANDARD REPORT

Working Standard - CLO4ISTDWRK

CLO4ISTDWRK		Description - Perchlorate ISTD Wrk 1,000ug/L			
Standard: 49946		Created By: Thomas Bosch		Amount: 25 mL	
MFG: ALS/SLC		Create Date: 09/23/2019 03:09PM		Expires: 09/19/2020	
MFG Lot: TNB: 09/20/2019		Verified By: Thomas Bosch		Usable: Yes	
Pipette ID: Not Provided		Verify Date:		Lab Lot: CLO4ISTDWRK	
Pos.	Analyte	Name	Concentration		
1	14797-73-0-8385	Perchlorate 83:85 Ratio	1000 ug/L		
2	14797-73-0-89	Perchlorate 89	1000 ug/L		
Composition					
Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
47863	CLO4ISTDSTK	Perchlorate ISTD Stock	CLO4ISTDSTK	0.25 mL	12/05/2028



STANDARD REPORT

Constituent

Stock Standard - CLO4ISTDSTK

CLO4ISTDSTK		Description - Perchlorate ISTD Stock	
Standard: 47863	Created By: Thomas Bosch	Amount: 1 mL	
MFG: Cambridge Isotope	Create Date: 05/23/2019 10:05AM	Expires: 12/05/2028	
MFG Lot: SDIH-016	Verified By: Thomas Bosch	Usable: Yes	
Part ID: OLM-7310-S	Verify Date:	Lab Lot: CLO4ISTDSTK	
Pos.	Analyte	Name	Concentration
1	14797-73-0-8385	Perchlorate 83:85 Ratio	100 ug/mL
2	14797-73-0-89	Perchlorate 89	100 ug/mL



STANDARD REPORT

Working Standard - CLO4 WRK

CLO4 WRK		Description - 6850 WKG Std 100.ug/L			
Standard: 49948		Created By: Thomas Bosch		Amount: 10 mL	
MFG: ALS/SLC		Create Date: 09/20/2019 03:09PM		Expires: 07/25/2020	
MFG Lot: TNB: 09/20/2019				Usable: Yes	
Pipette ID: Not Provided				Lab Lot: CLO4 WRK	
Pos.	Analyte	Name	Concentration		
1	14797-73-0	Perchlorate	0.1 ug/mL		
2	14797-73-0-8385	Perchlorate 83:85 Ratio	0.1 ug/mL		
Composition					
Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
49947	CLO4 INT	6850 Intermdt AccStd 10.ug/mL	CLO4 INT	0.1 mL	07/25/2020



STANDARD REPORT

Constituent

Stock Standard - CLO4 STOCK

CLO4 STOCK		Description - 6850 Stock AccStd 1,000ug/mL	
Standard: 43659		Created By: Thomas Bosch	Amount: 100 mL
MFG: AccuStandard		Create Date: 09/17/2018 09:09AM	Expires: 07/25/2020
MFG Lot: 218065075			Usable: Yes
Part ID: IC-PER-10X-1			Lab Lot: CLO4 STOCK
Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	1000 ug/mL
2	14797-73-0-8385	Perchlorate 83:85 Ratio	1000 ug/mL



STANDARD REPORT

Constituent

Solvent Standard - ASTM H2O

ASTM H2O		Description - ASTM Type II Water	
Standard: 109	Created By: ALS Support (Lims)	Amount: 1000 L	
MFG: DCL In House	Create Date: 10/06/2005 09:10AM	Expires: 11/07/2025	
MFG Lot: Not Provided		Usable: Yes	
Part ID: Not Provided		Lab Lot: LAB 109	
Pos.	Analyte	Name	Concentration
Solvent - Analyte(s) not applicable			



STANDARD REPORT

Constituent

Working Standard - CLO4 INT

CLO4 INT		Description - 6850 Intermdt AccStd 10.ug/mL			
Standard: 49947		Created By: Thomas Bosch		Amount: 10 mL	
MFG: ALS/SLC		Create Date: 09/23/2019 03:09PM		Expires: 07/25/2020	
MFG Lot: TNB: 09/20/2019				Usable: Yes	
Pipette ID: Not Provided				Lab Lot: CLO4 INT	
Pos.	Analyte	Name	Concentration		
1	14797-73-0	Perchlorate	10 ug/mL		
2	14797-73-0-8385	Perchlorate 83:85 Ratio	10 ug/mL		
Composition					
Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
43659	CLO4 STOCK	6850 Stock AccStd 1,000ug/mL	CLO4 STOCK	0.1 mL	07/25/2020



STANDARD REPORT

Working Standard - CLO4 QC WRK

CLO4 QC WRK		Description - 6850 QC WKG STD 100ug/L			
Standard: 47516		Created By: Thomas Bosch		Amount: 10 mL	
MFG: ALS/SLC		Create Date: 05/06/2019 03:05PM		Expires: 03/31/2020	
MFG Lot: TNB: 05/06/2019				Usable: Yes	
Pipette ID: Not Provided		Lab Lot: CLO4 QC WRK 100.ug/L			
Pos.	Analyte	Name	Concentration		
1	14797-73-0	Perchlorate	100 ug/L		
Composition					
Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
47515	CLO4 QC INT	6850 QC Intrmdt Std-QC 10ug/mL	CLO4 QC INT 10.ug/mL	0.1 mL	03/31/2020



STANDARD REPORT

Constituent

Solvent Standard - ASTM H2O

ASTM H2O		Description - ASTM Type II Water	
Standard: 109	Created By: ALS Support (Lims)	Amount: 1000 L	
MFG: DCL In House	Create Date: 10/06/2005 09:10AM	Expires: 11/07/2025	
MFG Lot: Not Provided		Usable: Yes	
Part ID: Not Provided		Lab Lot: LAB 109	
Pos.	Analyte	Name	Concentration
Solvent - Analyte(s) not applicable			



STANDARD REPORT

Constituent

Stock Standard - CLO4 QCSTOCK

CLO4 QCSTOCK		Description - 6850 QC Stock STD 1,000ug/mL	
Standard: 36748	Created By: Thomas Bosch	Amount: 100 mL	
MFG: Ultra Scientific	Create Date: 05/11/2017 01:05PM	Expires: 03/31/2020	
MFG Lot: CP-0860		Usable: Yes	
Part ID: ICC-013		Lab Lot: CLO4 QC STOCK	
Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	1000 ug/mL



STANDARD REPORT

Constituent

Working Standard - CLO4 QC INT

CLO4 QC INT		Description - 6850 QC Intrmdt Std-QC 10ug/mL			
Standard: 47515		Created By: Thomas Bosch		Amount: 10 mL	
MFG: ALS/SLC		Create Date: 05/06/2019 03:05PM		Expires: 03/31/2020	
MFG Lot: TNB: 05/06/2019				Usable: Yes	
Pipette ID: Not Provided				Lab Lot: CLO4 QC INT 10.ug/mL	
Pos.	Analyte	Name	Concentration		
1	14797-73-0	Perchlorate	10 ug/mL		
Composition					
Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
36748	CLO4 QCSTOCK	6850 QC Stock STD 1,000ug/mL	CLO4 QC STOCK	0.1 mL	03/31/2020

125 Market Street
New Haven, CT 06513
USA



Tel (203)786-5290
Fax (203)786-5287
www.AccuStandard.com

CERTIFICATE OF ANALYSIS



AccuTrace™ Reference Standard

Catalog No: IC-PER-10X-1
Description: Perchlorate Standard
Element: Perchlorate (ClO₄)
SRM: Ind. Std.
Lot: 218065075
Matrix: Water
Hazards: Refer to SDS for complete safety information

Date Certified: Jun 25, 2018
Expiration: Jul 25, 2020
Sample Size: 100 mL
Components: 1
Storage Condition: Ambient (>5 °C)
Included on ISO/IEC 17025 Scope of Accreditation: Yes
Included on ISO 17034 Scope of Accreditation: Yes



Signal Word: None

Component	SRM #	Prepared Concentration (µg/mL)
ClO ₄ Perchlorate	Ind. Std.	1000

The gravimetric uncertainty for this product is ±0.24%.

The final solution was checked against an independent standard to verify its concentration.

We use the highest purity raw materials available to minimize impurity levels in the final solution. Typically 99.999%+ pure starting materials are used as well as ASTM Type I 18 megohm deionized water.

All solutions are filtered through a 0.2 µm filter prior to being bottled.

All glassware used in preparation is Class A and calibrated regularly.

All weights are traceable through NIST; Test No. 822-275872-11

All bottles are triple rinsed with deionized water prior to use.

Shake bottle prior to use and do not pipette directly out of the bottle. Use only cleaned Class A volumetric glassware.

We certify the accuracy of this standard to be ±0.5% of the stated value until its expiration date provided it is kept tightly capped and stored under the conditions stated above.

Certified By:

Meigan O'Leary, Inorganic QC Manager



Certificate of Analysis



ISO Guide 34 Reference Material

Product Number: ICC-013

Lot Number: CP-0860

S



Lot Issue Date: 29-Feb 2016

Expiration Date: 31-Mar 2020

Product Name: Perchlorate IC Standard

Description:

This Reference Material (RM) was gravimetrically prepared in accordance with ISO Guide 34 and under ULTRA Scientific's ISO 9001 registered quality system. The neat materials used for this product have been verified by ULTRA's ISO 17025 laboratory and under ULTRA's ISO Guide 34 accreditation. The analyte concentrations were verified by ULTRA's ISO 17025 accredited laboratory. For each analyte, the true value, with its uncertainty value calculated at the 95% confidence level, is reported below.

Analyte	Starting Material	Lot Number	Purity (%)	Calculated Value	True Value	Traceability & Method
perchlorate	potassium perchlorate	RM07987	100	1001 ± 5 µg/mL	976 ± 6 µg/mL	NIST SRM 3141A; ICP-OES

Solvent: water (low TOC, < 50 ppb)

Storage: Store at Room Temperature (15° to 30°C).

Traceability:

Traceability has been established through an unbroken chain of comparisons, each having stated uncertainties. Comparisons are based on appropriate physical or chemical measurements, including gravimetric or volumetric dilution, where the mass or volume of a solution before and after dilution is measured. The balances used for these measurements are calibrated with weights traceable to NIST in compliance with ANSI/NCCL Z-540-1, ISO 9001, ISO 17025, and ISO Guide 34. Calibrated Class A glassware is used for volumetric measurements. Thermometers are calibrated against a NIST traceable thermometer in accordance with NIST Special Publication 819.

Estimation of Uncertainties:

The true value is reported, with its uncertainty value calculated at the 95% confidence level.

Homogeneity:

This RM was formulated and unitized according to an in-house procedure and is guaranteed to be homogeneous. There is no minimum sub-sample size required.

Intended Use:

This RM is intended for the preparation of working reference samples for use in routine laboratory analyses, calibration of instruments, validation of analytical methods, assessments of measurement methods and continuing calibration verification.

Instructions for Use:

Sample aliquots for analysis should be withdrawn at 20°C to 25°C immediately after opening and should be processed without delay for the true value to be valid within the stated uncertainties. Do not pipet from the bottle. Do not return any material removed for pipetting to the bottle. Tightly cap the bottle after removing any material and store according to the instructions noted above.

Hazards:

Refer to the Safety Data Sheet for information regarding this RM.

Expiration of Certification:

The certification of this RM is valid, within the measurement uncertainty specified, until the expiration date specified above, provided the RM is handled and stored in accordance with the instructions given in this certificate. This certification is nullified if the RM is damaged, contaminated, or otherwise modified.



ISO 9001 Registered Quality System – TUV USA

Page 1 of 2



Certificate of Analysis

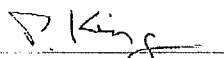



ISO Guide 34 Reference Material

Product Number: ICC-013 Lot Issue Date: 29-Feb 2016
 Lot Number: CP-0860 Expiration Date: 31-Mar 2020

Maintenance of Certification:

The real-time, long term stability of the RM may be monitored over the lifetime of the certification. If substantive changes occur that affect the certification before the expiration of this certificate, ULTRA Scientific will notify the purchaser.


 Peter A. King, Ph.D.
 VP, Technical Operations


 Daniel J. Lamendola
 Director of QA/RA



ISO 9001 Registered Quality System – TUV USA

Page 2 of 2



Product Name: PERCHLORIC ACID, SODIUM SALT
(Isotopic Label & Enrichment Specification) (18O4, 90%+) 100 UG/ML IN WATER

Lot Number: SDIH-016

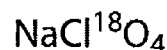
Catalog Number: OLM-7310-S

Product Information

Chemical Purity Specification: $\geq 98\%$

MW*: 130.44
* For isotopically labeled compounds, MW listed is for the fully enriched product.

Labeled CAS Number: NA



Unlabeled CAS Number: 7601-89-0

Chemical Formula: NaCl*O4

Storage: Store at room temperature away from light and moisture.

Stability: See storage and expiration date.

Certification

Cambridge Isotope Laboratories, Inc. guarantees that this material meets or exceeds the specifications stated. Absolute identity as well as chemical and isotopic purities are assured by the use of unambiguous synthetic routes and multiple chemical analyses whenever possible. Results are representative of QC testing at time of release from Quality Control unless otherwise stated. CIL Certificates of Analysis are occasionally updated with new data following recertification. We recommend checking the website for the latest version.

Volumetric measurements were made with Class A glassware. Gravimetry is traceable to the NIST through calibrated balances and certified, calibrated, standard weights. The calibrations are traceable to the NIST under Test No. 822/270236-04. The calibrations also meet specifications outlined in ISO 9001, ISO/IEC 17025, ANSI/NSCL Z540-1-1994, NCR Document 10CFR50 Appendix B, and applicable subdocuments.

This COA references the bulk catalog number before packaging. The COA also applies to the CIL finished good catalog number. Some possible packaging sizes and their corresponding suffix are -1.2, -1, -0.5, -10, or -0.1.

Approved by: Sashi Sivendran-Basak

Sashi Sivendran-Basak, Ph.D., Quality Review

Quality Control Tests and Results

QC Release Date	12/05/2018
Expiration Date	12/05/2028
Concentration Based on Gravimetry	100.0 \pm 1.0 $\mu\text{g/mL}$ (k=2)
Chemical Purity of Neat Material(s)	98%
LC/MS for Concentration	105.4 \pm 1.1 $\mu\text{g/mL}$ (k=2)



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Batch Review Method:

C:\HPCHEM\1\METHODS\CLO4-DP3.M

['#' ==> Run has not been reprocessed with Batch Review Method

['*' ==> Run has been saved with batch file]

#*	Sample	Location	Inj	SampleType	Run	Perchlorate Area	Perchlorat RT	Perchlorate Amount		
*	689407	CCV@25	Vial 71	1	Control	1	2.04111e6	7.471	26.70894	
*	689408	QC@3.0	Vial 72	1	Control	2	2.12147e5	7.304	3.31347	
*	689410	ICS@3.0	Vial 73	1	Control	3	1.66491e5	7.340	3.40481	
*	689411	LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000	
*	1934851001		Vial 75	1	Sample	5	0.00000	0.000	0.00000	
*	689412	348511S	Vial 76	1	Sample	6	1.38253e5	7.037	2.83835	
*	689413	348511D	Vial 77	1	Sample	7	1.40128e5	7.058	2.81186	
*	1934851002		Vial 78	1	Sample	8	0.00000	0.000	0.00000	
*	1934851003		Vial 79	1	Sample	9	0.00000	0.000	0.00000	
*	1934851004		Vial 80	1	Sample	10	0.00000	0.000	0.00000	
*	1934851005		Vial 81	1	Sample	11	9.83459e4	7.243	1.78789	
*	1934851006		Vial 82	1	Sample	12	5.44257e6	7.287	72.53538	
*	1934851007	100	Vial 83	1	Sample	13	1.73953e6	7.475	2605.96119	
*	1935316001		Vial 84	1	Sample	14	3.52468e4	7.247	5.74894e-1	<RL
*	689414	CCV@25	Vial 71	1	Control	15	1.84036e6	7.451	26.75450	
*	1935316002		Vial 85	1	Sample	16	3.77116e4	7.221	6.01872e-1	
*	1935316003		Vial 86	1	Sample	17	0.00000	0.000	0.00000	
*	1935316004		Vial 87	1	Sample	18	7.95168e4	7.352	1.36838	
*	1935343001		Vial 88	1	Sample	19	4.74847e4	7.368	6.12339e-1	<RL
*	1935343002		Vial 89	1	Sample	20	2.21821e6	7.450	31.67406	
*	1935343003		Vial 90	1	Sample	21	2.24522e6	7.455	28.95321	
*	1935343004	1K	Vial 91	1	Sample	22	2.15597e6	7.560	3.16912e4	
*	1935343005	10X	Vial 92	1	Sample	23	2.14251e6	7.460	306.28091	
*	1935343006	1K	Vial 93	1	Sample	24	1.59545e6	7.560	2.44498e4	
*	689415	CCV@25	Vial 71	1	Control	26	1.93976e6	7.449	27.06627	

#*	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount	
*	689407	CCV@25	Vial 71	1	Control	1	2.59291e5	7.493	5.00000
*	689408	QC@3.0	Vial 72	1	Control	2	2.35842e5	7.331	5.00000
*	689410	ICS@3.0	Vial 73	1	Control	3	1.80164e5	7.367	5.00000
*	689411	LMB	Vial 74	1	Control	4	2.03065e5	7.582	5.00000
*	1934851001		Vial 75	1	Sample	5	1.95221e5	7.066	5.00000
*	689412	348511S	Vial 76	1	Sample	6	1.79080e5	7.059	5.00000
*	689413	348511D	Vial 77	1	Sample	7	1.83192e5	7.075	5.00000
*	1934851002		Vial 78	1	Sample	8	1.96897e5	7.325	5.00000
*	1934851003		Vial 79	1	Sample	9	2.13267e5	7.369	5.00000
*	1934851004		Vial 80	1	Sample	10	2.55178e5	7.427	5.00000
*	1934851005		Vial 81	1	Sample	11	1.99854e5	7.262	5.00000
*	1934851006		Vial 82	1	Sample	12	2.13698e5	7.303	5.00000
*	1934851007	100	Vial 83	1	Sample	13	2.27091e5	7.495	500.00000
*	1935316001		Vial 84	1	Sample	14	2.04618e5	7.262	5.00000
*	689414	CCV@25	Vial 71	1	Control	15	2.33347e5	7.471	5.00000
*	1935316002		Vial 85	1	Sample	16	2.10291e5	7.237	5.00000
*	1935316003		Vial 86	1	Sample	17	2.35612e5	7.318	5.00000
*	1935316004		Vial 87	1	Sample	18	2.08671e5	7.360	5.00000
*	1935343001		Vial 88	1	Sample	19	2.60797e5	7.401	5.00000
*	1935343002		Vial 89	1	Sample	20	2.32847e5	7.471	5.00000
*	1935343003		Vial 90	1	Sample	21	2.60703e5	7.474	5.00000
*	1935343004	1K	Vial 91	1	Sample	22	2.26176e5	7.573	5000.00000
*	1935343005	10X	Vial 92	1	Sample	23	2.33572e5	7.478	50.00000
*	1935343006	1K	Vial 93	1	Sample	24	2.23474e5	7.585	5000.00000
*	689415	CCV@25	Vial 71	1	Control	26	2.42807e5	7.466	5.00000

Batch Report: C:\HPCHEM\1\DATA\20DEC19D\20DEC19S.B

#*	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount	
*	689407	CCV@25	Vial 71	1	Control	1	5.93972e5	7.487	25.61044
*	689408	QC@3.0	Vial 72	1	Control	2	6.76074e4	7.319	3.37214
*	689410	ICS@3.0	Vial 73	1	Control	3	5.88058e4	7.363	3.85429
*	689411	LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
*	1934851001		Vial 75	1	Sample	5	0.00000	0.000	0.00000
*	689412	348511S	Vial 76	1	Sample	6	4.66372e4	7.052	3.05269
*	689413	348511D	Vial 77	1	Sample	7	4.60206e4	7.076	2.94032
*	1934851002		Vial 78	1	Sample	8	0.00000	0.000	0.00000
*	1934851003		Vial 79	1	Sample	9	0.00000	0.000	0.00000
*	1934851004		Vial 80	1	Sample	10	0.00000	0.000	0.00000
*	1934851005		Vial 81	1	Sample	11	3.27990e4	7.260	1.87240
*	1934851006		Vial 82	1	Sample	12	1.62653e6	7.303	72.09762
*	1934851007	100	Vial 83	1	Sample	13	5.14969e5	7.496	2537.47075
*	1935316001		Vial 84	1	Sample	14	1.31713e4	7.258	6.37095e-1
*	689414	CCV@25	Vial 71	1	Control	15	5.38679e5	7.465	25.79127
*	1935316002		Vial 85	1	Sample	16	1.63168e4	7.250	8.01605e-1
*	1935316003		Vial 86	1	Sample	17	0.00000	0.000	0.00000
*	1935316004		Vial 87	1	Sample	18	2.26779e4	7.376	1.18748
*	1935343001		Vial 88	1	Sample	19	1.63337e4	7.429	6.15421e-1
*	1935343002		Vial 89	1	Sample	20	6.46838e5	7.469	30.49596
*	1935343003		Vial 90	1	Sample	21	6.55399e5	7.466	27.86984
*	1935343004	1K	Vial 91	1	Sample	22	6.33070e5	7.573	3.07034e4
*	1935343005	10X	Vial 92	1	Sample	23	6.46073e5	7.474	303.78698
*	1935343006	1K	Vial 93	1	Sample	24	4.66349e5	7.577	2.35134e4
*	689415	CCV@25	Vial 71	1	Control	26	5.67687e5	7.463	26.09198

*** End of Report ***

Sequence Table:

Method and Injection Info Part:

Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
====	=====	=====	=====	===	=====	=====	=====
1	Vial 71	689407	CCV@25	CLO4-AQN	1	Ctrl Samp	
2	Vial 72	689408	QC@3.0	CLO4-AQN	1	Ctrl Samp	
3	Vial 73	689410	ICS@3.0	CLO4-AQN	1	Ctrl Samp	
4	Vial 74	689411	LMB	CLO4-AQN	1	Ctrl Samp	
5	Vial 75	1934851001		CLO4-AQN	1	Sample	
6	Vial 76	689412	348511S	CLO4-AQN	1	Sample	
7	Vial 77	689413	348511D	CLO4-AQN	1	Sample	
8	Vial 78	1934851002		CLO4-AQN	1	Sample	
9	Vial 79	1934851003		CLO4-AQN	1	Sample	
10	Vial 80	1934851004		CLO4-AQN	1	Sample	
11	Vial 81	1934851005		CLO4-AQN	1	Sample	
12	Vial 82	1934851006		CLO4-AQN	1	Sample	
13	Vial 83	1934851007	100	CLO4-AQN	1	Sample	
14	Vial 84	1935316001		CLO4-AQN	1	Sample	
15	Vial 71	689414	CCV@25	CLO4-AQN	1	Ctrl Samp	
16	Vial 85	1935316002		CLO4-AQN	1	Sample	
17	Vial 86	1935316003		CLO4-AQN	1	Sample	
18	Vial 87	1935316004		CLO4-AQN	1	Sample	
19	Vial 88	1935343001		CLO4-AQN	1	Sample	
20	Vial 89	1935343002		CLO4-AQN	1	Sample	
21	Vial 90	1935343003		CLO4-AQN	1	Sample	
22	Vial 91	1935343004	1K	CLO4-AQN	1	Sample	
23	Vial 92	1935343005	10X	CLO4-AQN	1	Sample	
24	Vial 93	1935343006	1K	CLO4-AQN	1	Sample	
25	Vial 94	1934851006	10X	CLO4-AQN	1	Sample	
26	Vial 71	689415	CCV@25	CLO4-AQN	1	Ctrl Samp	

Data file: C:\HPCHEM\1\DATA\20DEC19D\20DEC19D01.D

Sample Name: 689407 CCV@25

Injection Date: 12/20/2019 13:20:20

Seq Line: 1

Sample Name: 689407 CCV@25

Location: Vial 71

Acq Operator: TNB

Inj. No.: 1

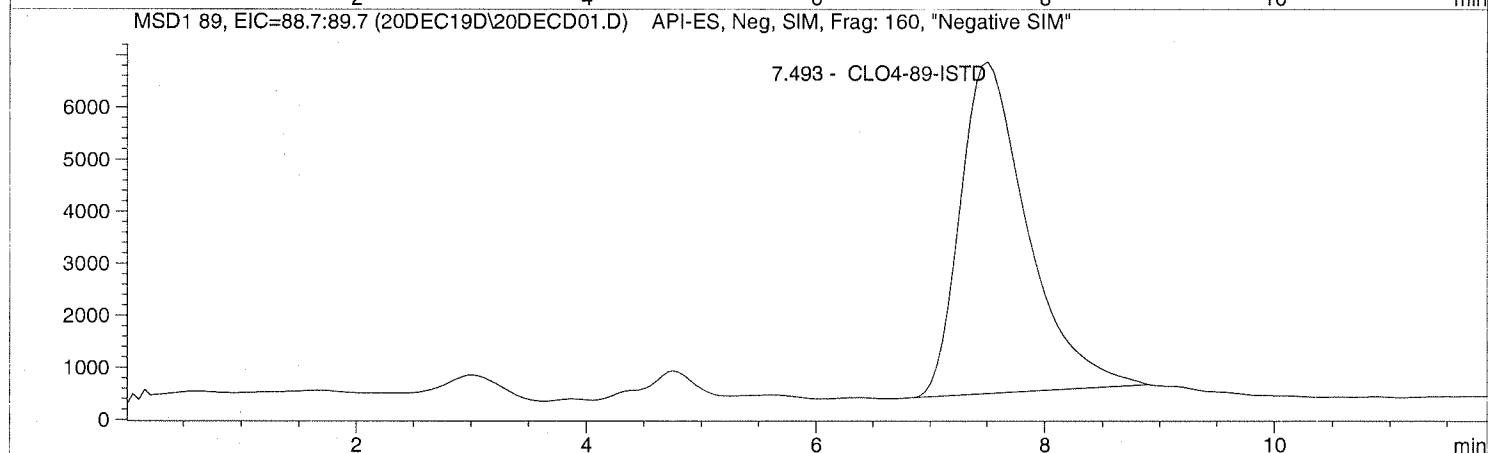
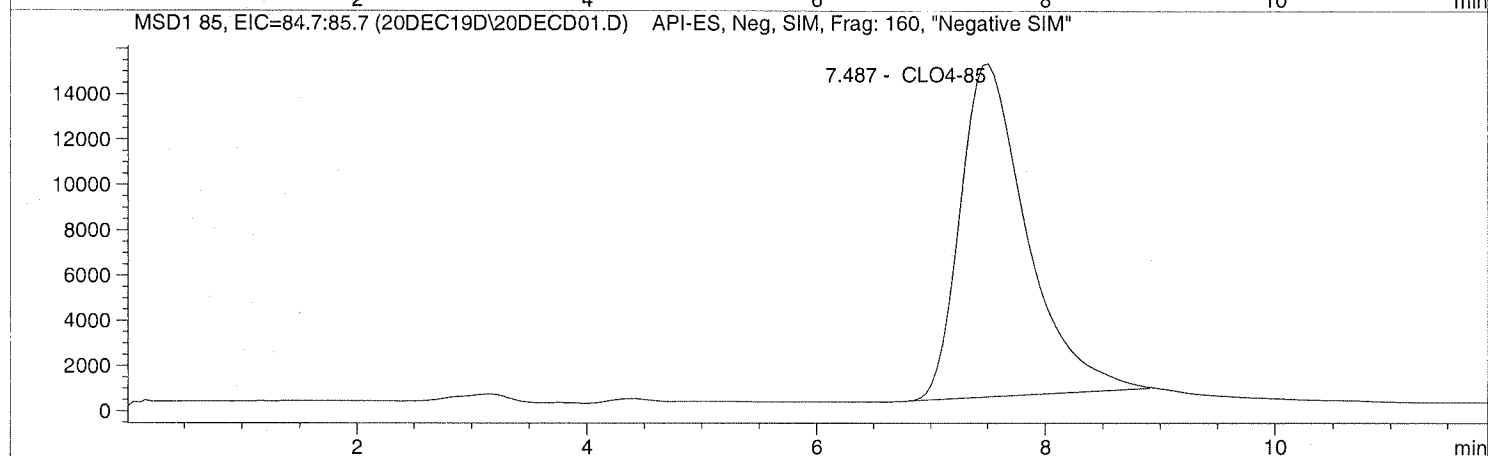
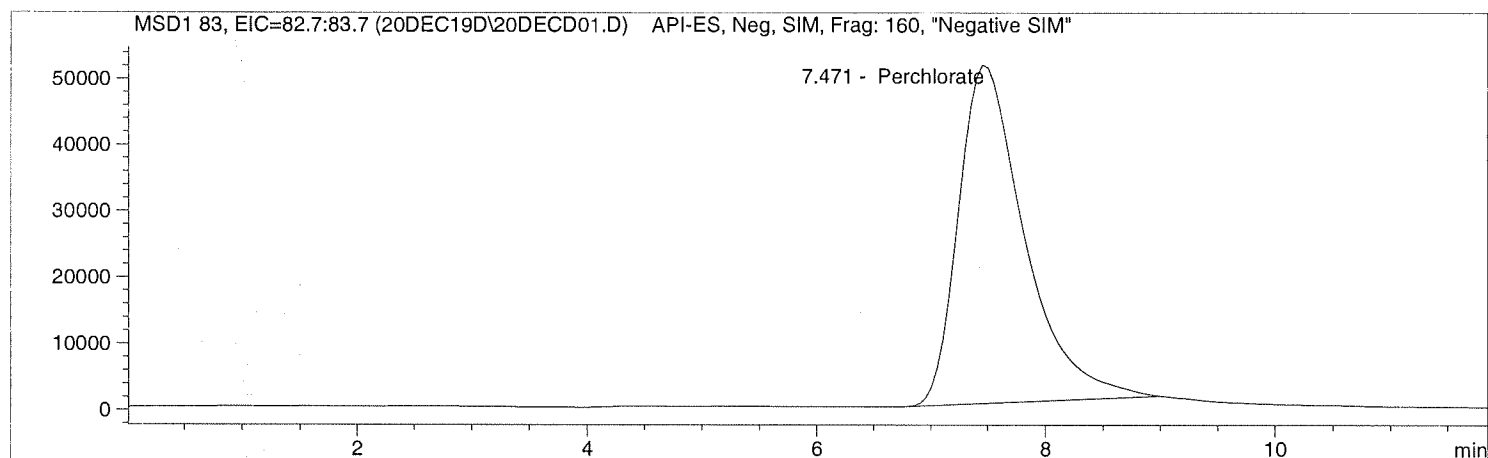
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M

Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20DEC19D\20DECD01.D Sample Name: 689407 CCV@25

```

=====
Injection Date: 12/20/2019 13:20:20      Seq Line: 1
Sample Name: 689407 CCV@25              Location: Vial 71
Acq Operator: TNB                        Inj. No.: 1
                                           Inj. Vol.: 35 µl
=====

```

```

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By: Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 25.000
=====

```

```

=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.471	PBA	2041110.1	26.7089	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.487	PBA	593972.4	25.6104	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.493	PBA	259291.4	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\20DEC19D\20DEC19D02.D

Sample Name: 689408 QC@3.0

Injection Date: 12/20/2019 13:34:12

Seq Line: 2

Sample Name: 689408 QC@3.0

Location: Vial 72

Acq Operator: TNB

Inj. No.: 1

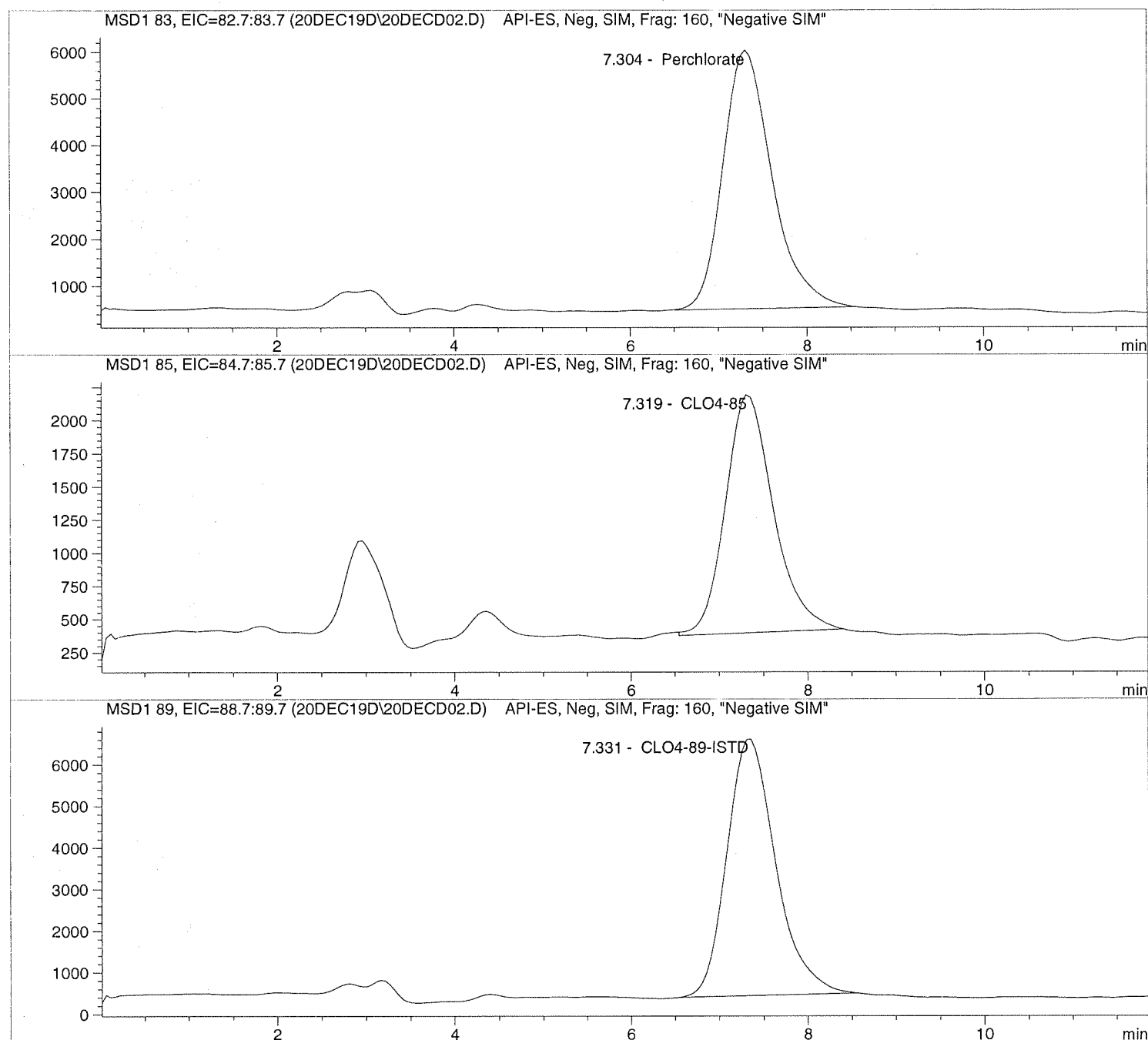
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M

Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20DEC19D\20DEC02.D Sample Name: 689408 QC@3.0

```

=====
Injection Date: 12/20/2019 13:34:12      Seq Line:      2
Sample Name:    689408 QC@3.0             Location:      Vial 72
Acq Operator:   TNB                       Inj. No.:     1
                                           Inj. Vol.:    35 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  3.000
=====

```

```

=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.304	BBA	212146.7	3.3135	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.319	BBA	67607.4	3.3721	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.331	PBA	235841.7	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

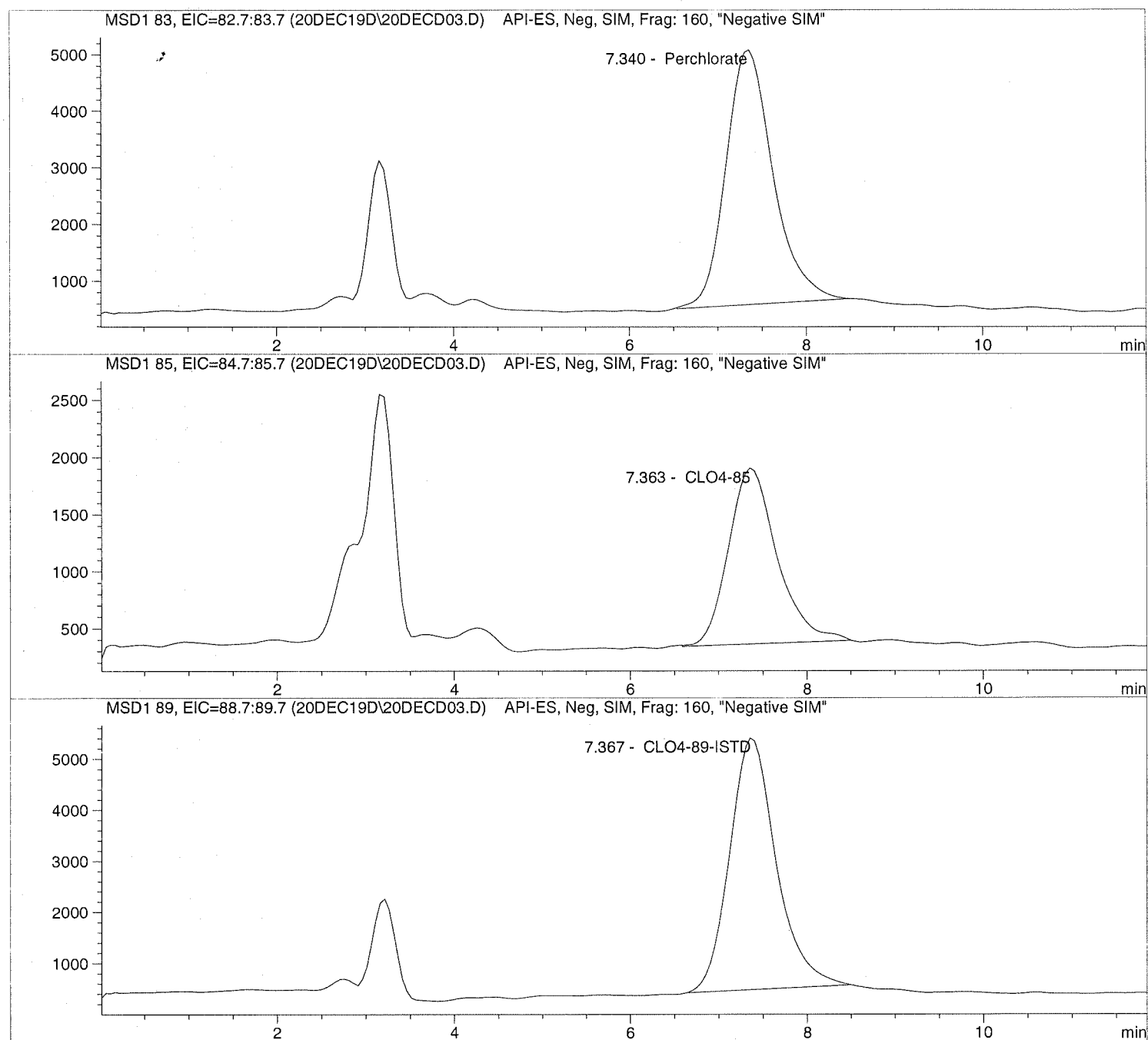
```

Data file: C:\HPCHEM\1\DATA\20DEC19D\20DECD03.D Sample Name: 689410 ICS@3.0

=====
Injection Date: 12/20/2019 13:48:05 Seq Line: 3
Sample Name: 689410 ICS@3.0 Location: Vial 73
Acq Operator: TNB Inj. No.: 1
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis
=====



Data file: C:\HPCHEM\1\DATA\20DEC19D\20DEC03.D Sample Name: 689410 ICS@3.0

```

=====
Injection Date: 12/20/2019 13:48:05      Seq Line: 3
Sample Name: 689410 ICS@3.0             Location: Vial 73
Acq Operator: TNB                       Inj. No.: 1
                                           Inj. Vol.: 35 µl
=====

```

```

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45
=====

```

Perchlorate analysis

Sample Information

```

=====
Sorted By: Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 3.000
=====

```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.340	BBA	166491.5	3.4048	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.363	BBA	58805.8	3.8543	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.367	BBA	180164.4	5.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\20DEC19D\20DECD04.D

Sample Name: 689411 LMB

Injection Date: 12/20/2019 14:02:00

Seq Line: 4

Sample Name: 689411 LMB

Location: Vial 74

Acq Operator: TNB

Inj. No.: 1

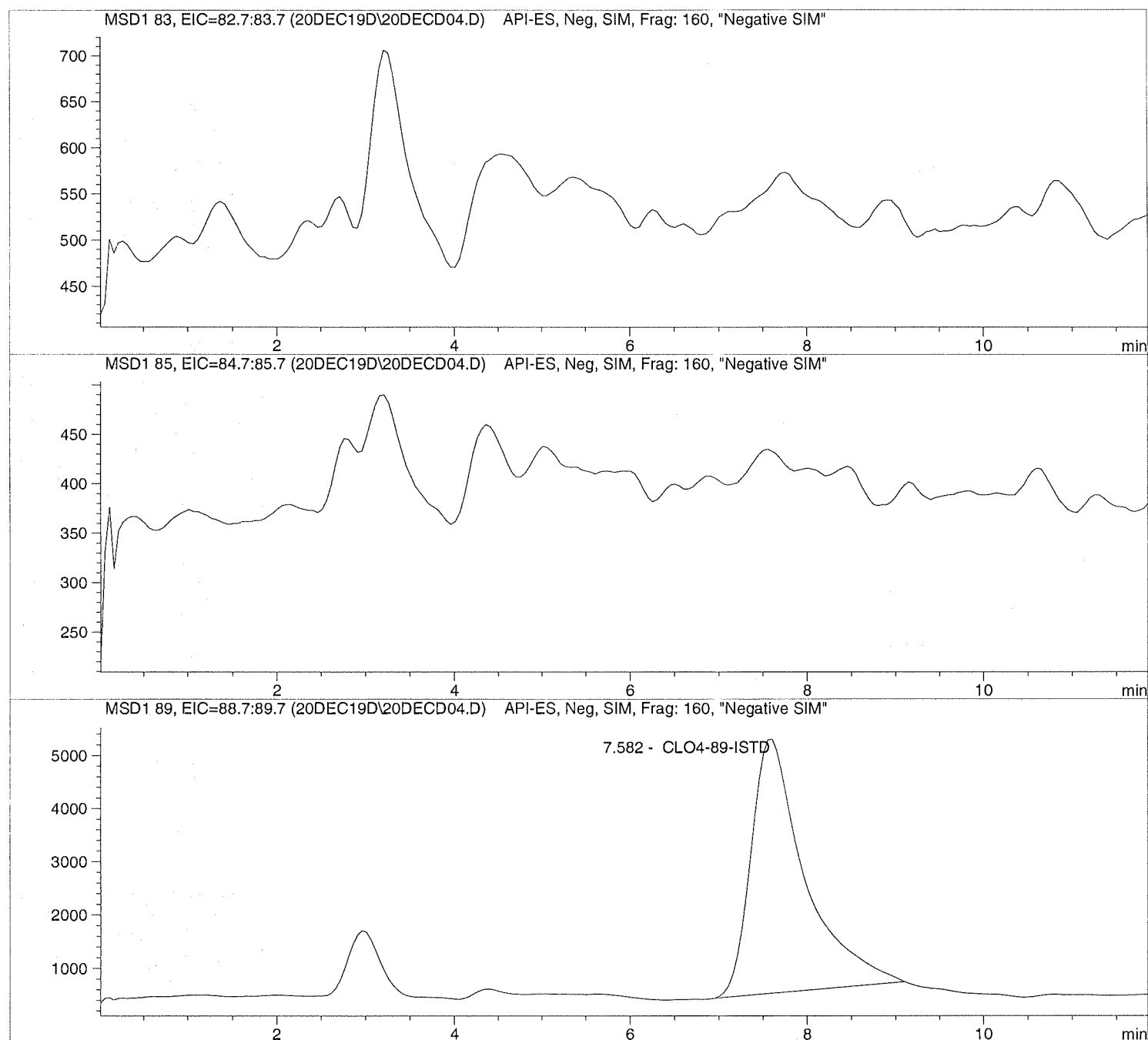
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M

Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20DEC19D\20DECD04.D Sample Name: 689411 LMB

```

=====
Injection Date: 12/20/2019 14:02:00      Seq Line:          4
Sample Name:    689411 LMB                Location:         Vial 74
Acq Operator:  TNB                       Inj. No.:        1
                                           Inj. Vol.:       35 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  0.000
=====

```

```

=====
                          LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.582	PBA	203064.9	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\20DEC19D\20DEC19D05.D

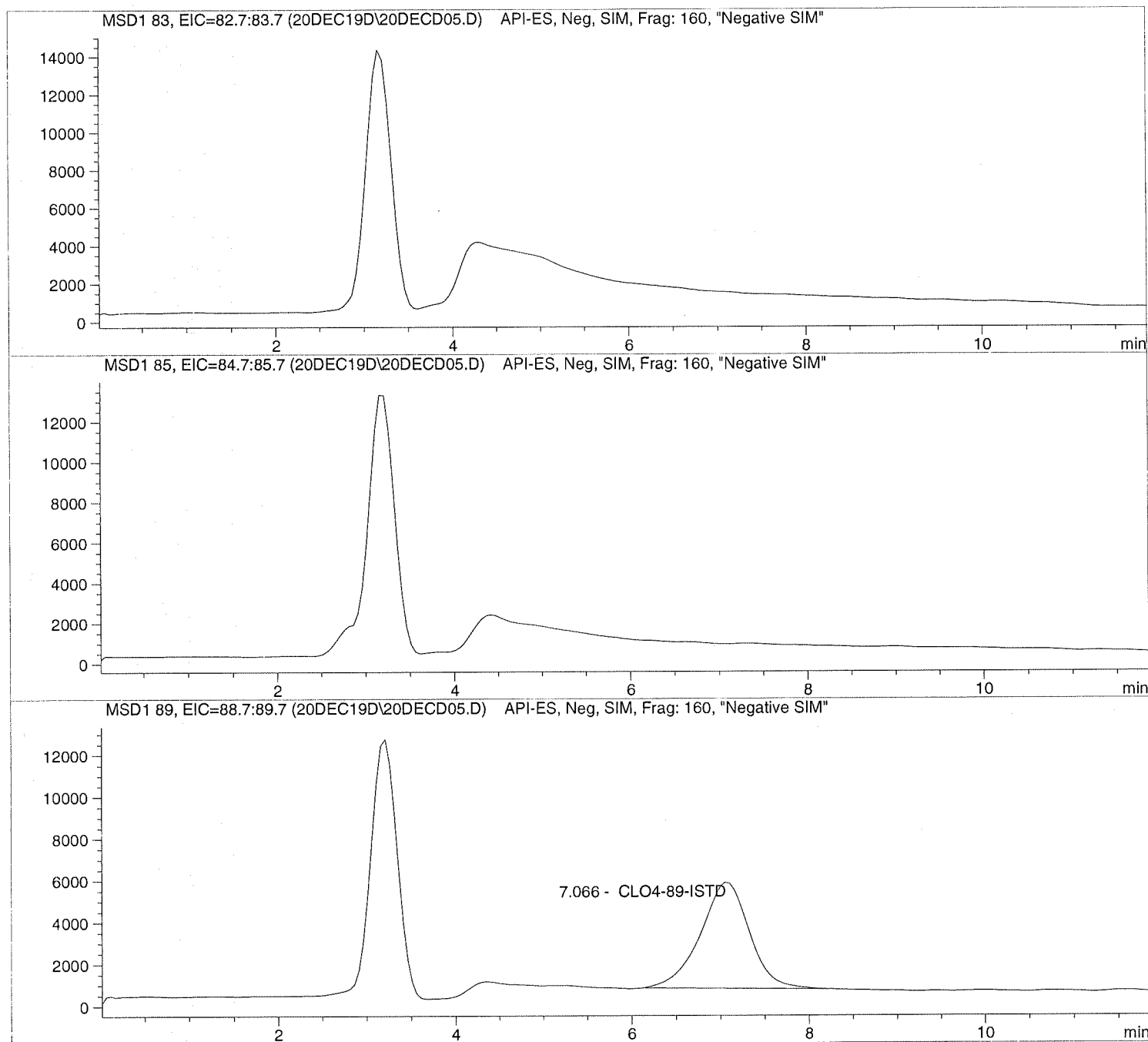
Sample Name: 1934851001

=====
Injection Date: 12/20/2019 14:15:58
Sample Name: 1934851001
Acq Operator: TNB

Seq Line: 5
Location: Vial 75
Inj. No.: 1
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20DEC19D\20DEC19D05.D Sample Name: 1934851001

```

=====
Injection Date: 12/20/2019 14:15:58      Seq Line:      5
Sample Name:   1934851001                Location:      Vial 75
Acq Operator:  TNB                       Inj. No.:     1
                                           Inj. Vol.:    35 µl
=====

```

```

Acq. Method:   CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:  11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  0.000
=====

```

```

=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.066	PBA	195221.4	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\20DEC19D\20DECD06.D

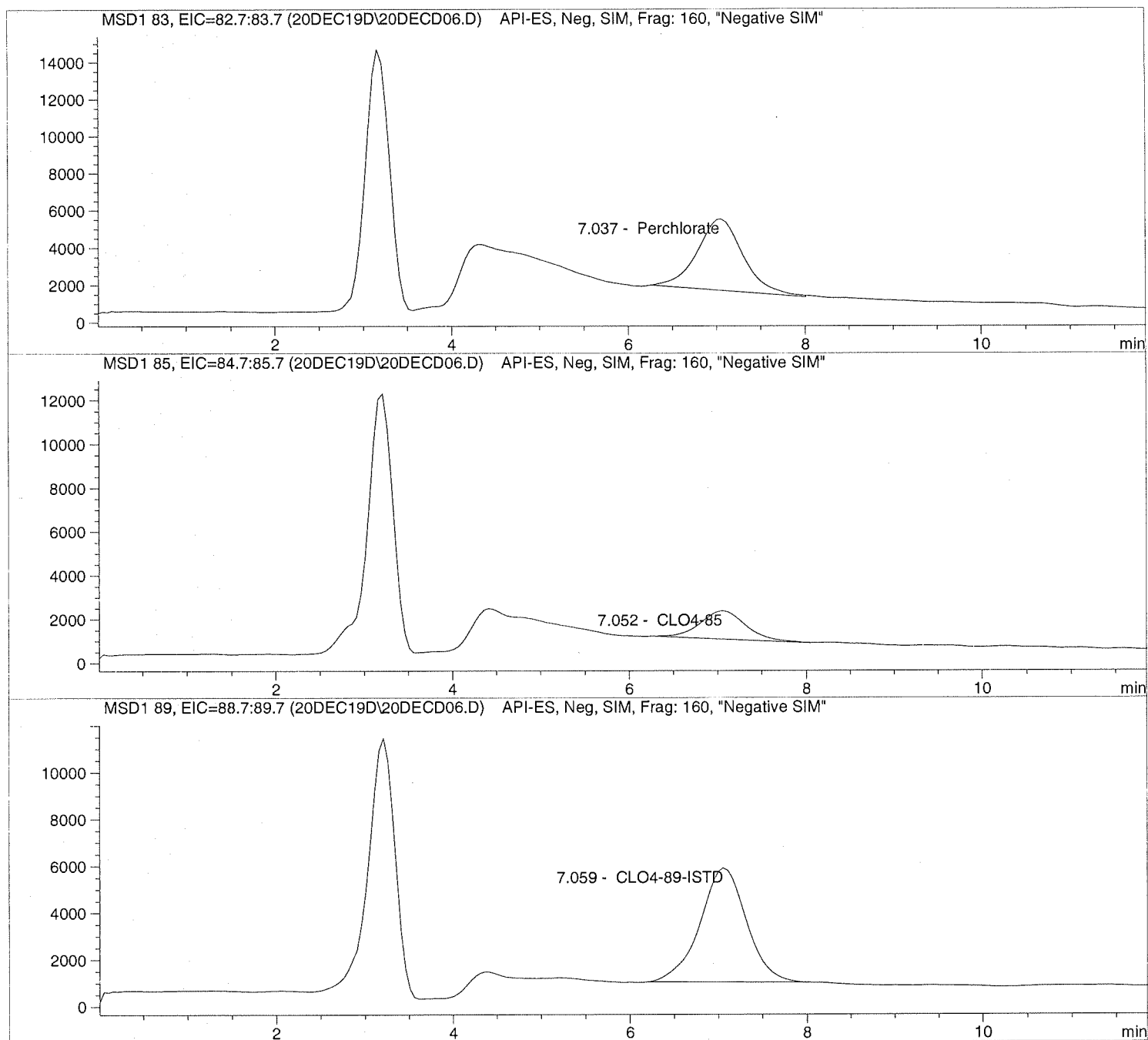
Sample Name: 689412 348511S

Injection Date: 12/20/2019 14:29:51
Sample Name: 689412 348511S
Acq Operator: TNB

Seq Line: 6
Location: Vial 76
Inj. No.: 1
Inj. Vol.: 35 μ l

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20DEC19\20DECD06.D Sample Name: 689412 348511S

```

=====
Injection Date: 12/20/2019 14:29:51      Seq Line:          6
Sample Name:    689412 348511S           Location:          Vial 76
Acq Operator:   TNB                      Inj. No.:         1
                                           Inj. Vol.:        35 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  0.000
=====

```

```

=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.037	PBA	138252.7	2.8383	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.052	PBA	46637.2	3.0527	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.059	PBA	179079.6	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\20DEC19D\20DEC07.D

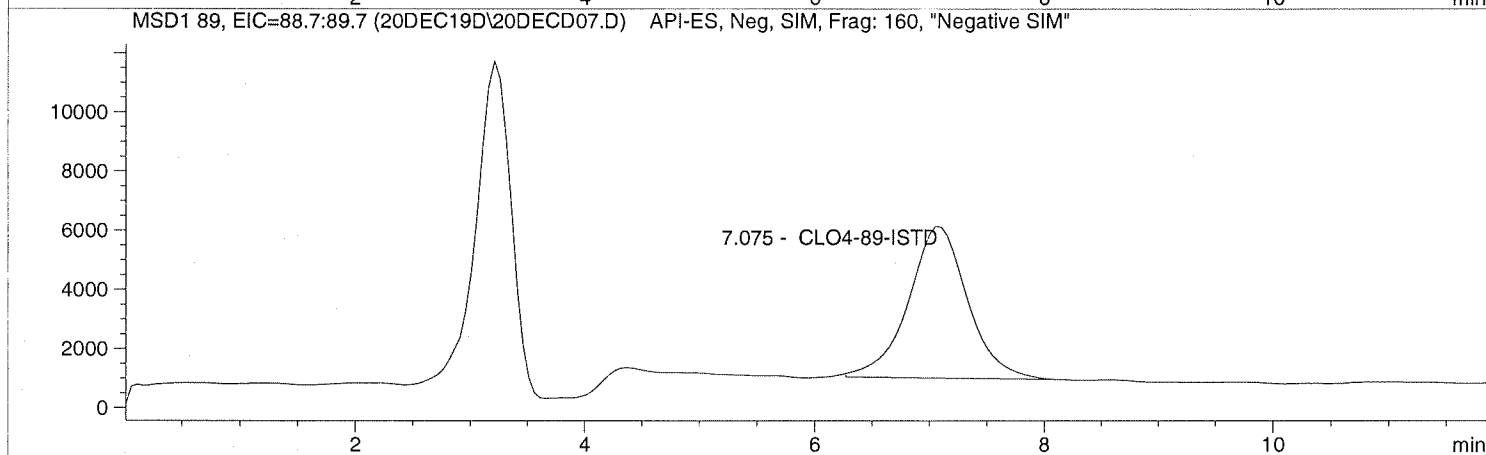
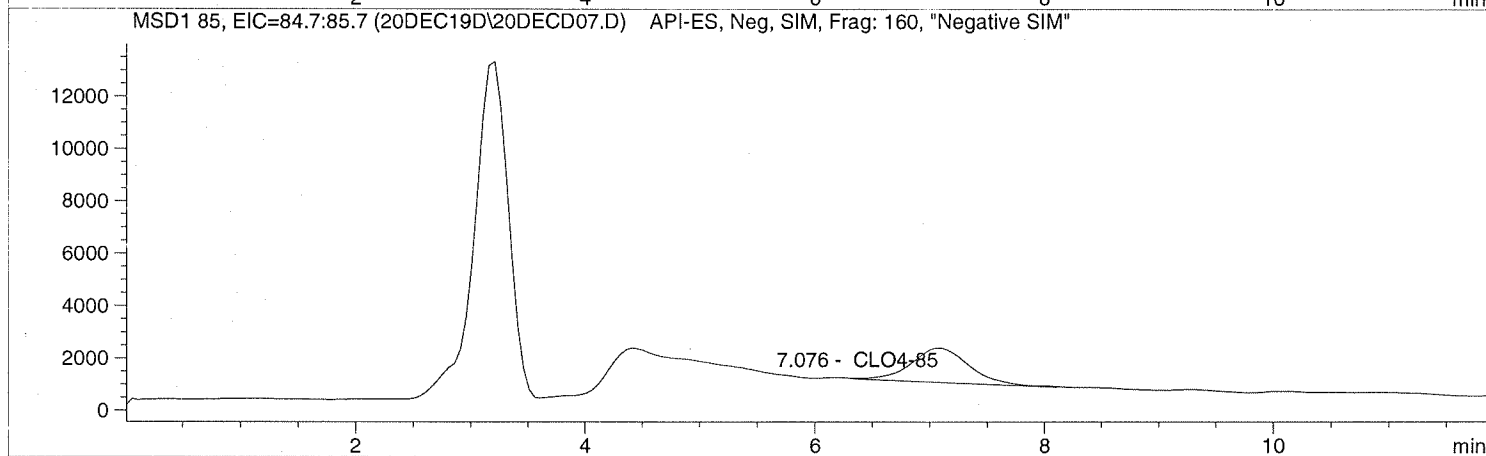
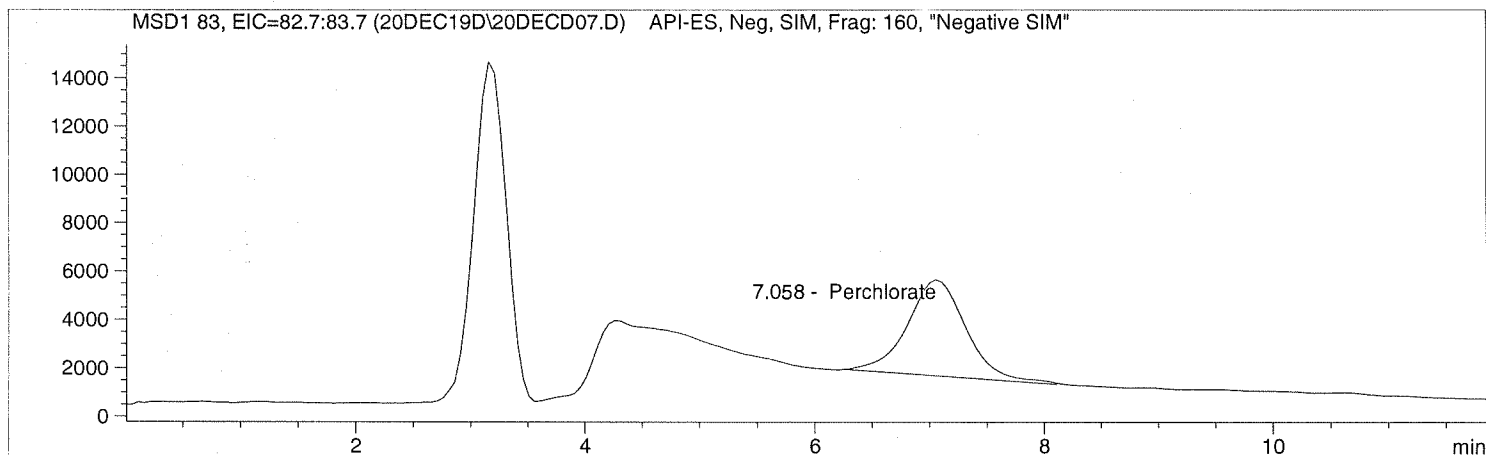
Sample Name: 689413 348511D

Injection Date: 12/20/2019 14:43:48
Sample Name: 689413 348511D
Acq Operator: TNB

Seq Line: 7
Location: Vial 77
Inj. No.: 1
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20DEC19D\20DECD07.D Sample Name: 689413 348511D

```

=====
Injection Date: 12/20/2019 14:43:48      Seq Line: 7
Sample Name: 689413 348511D             Location: Vial 77
Acq Operator: TNB                        Inj. No.: 1
                                           Inj. Vol.: 35 µl
=====

```

```

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By: Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 0.000
=====

```

```

=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.058	PBA	140128.3	2.8119	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.076	BBA	46020.6	2.9403	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.075	BBA	183191.7	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\20DEC19D\20DEC19D08.D

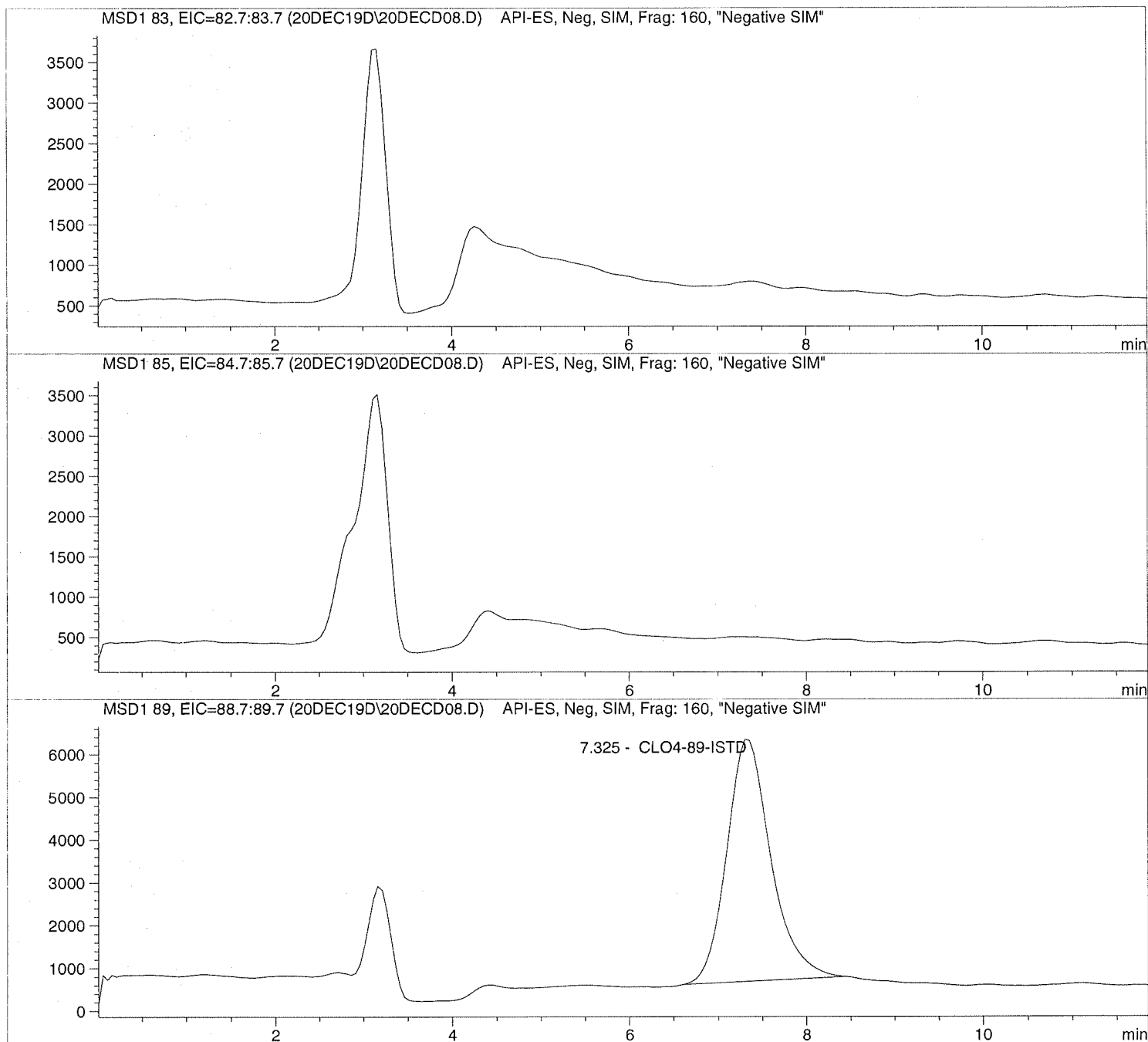
Sample Name: 1934851002

Injection Date: 12/20/2019 14:57:42
Sample Name: 1934851002
Acq Operator: TNB

Seq Line: 8
Location: Vial 78
Inj. No.: 1
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20DEC19D\20DECD08.D Sample Name: 1934851002

```

=====
Injection Date: 12/20/2019 14:57:42      Seq Line:      8
Sample Name:   1934851002                Location:      Vial 78
Acq Operator:  TNB                       Inj. No.:     1
                                           Inj. Vol.:    35 µl
=====

```

```

Acq. Method:   CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:  11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  0.000
=====

```

```

=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.325	PBA	196897.1	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\20DEC19D\20DECD09.D

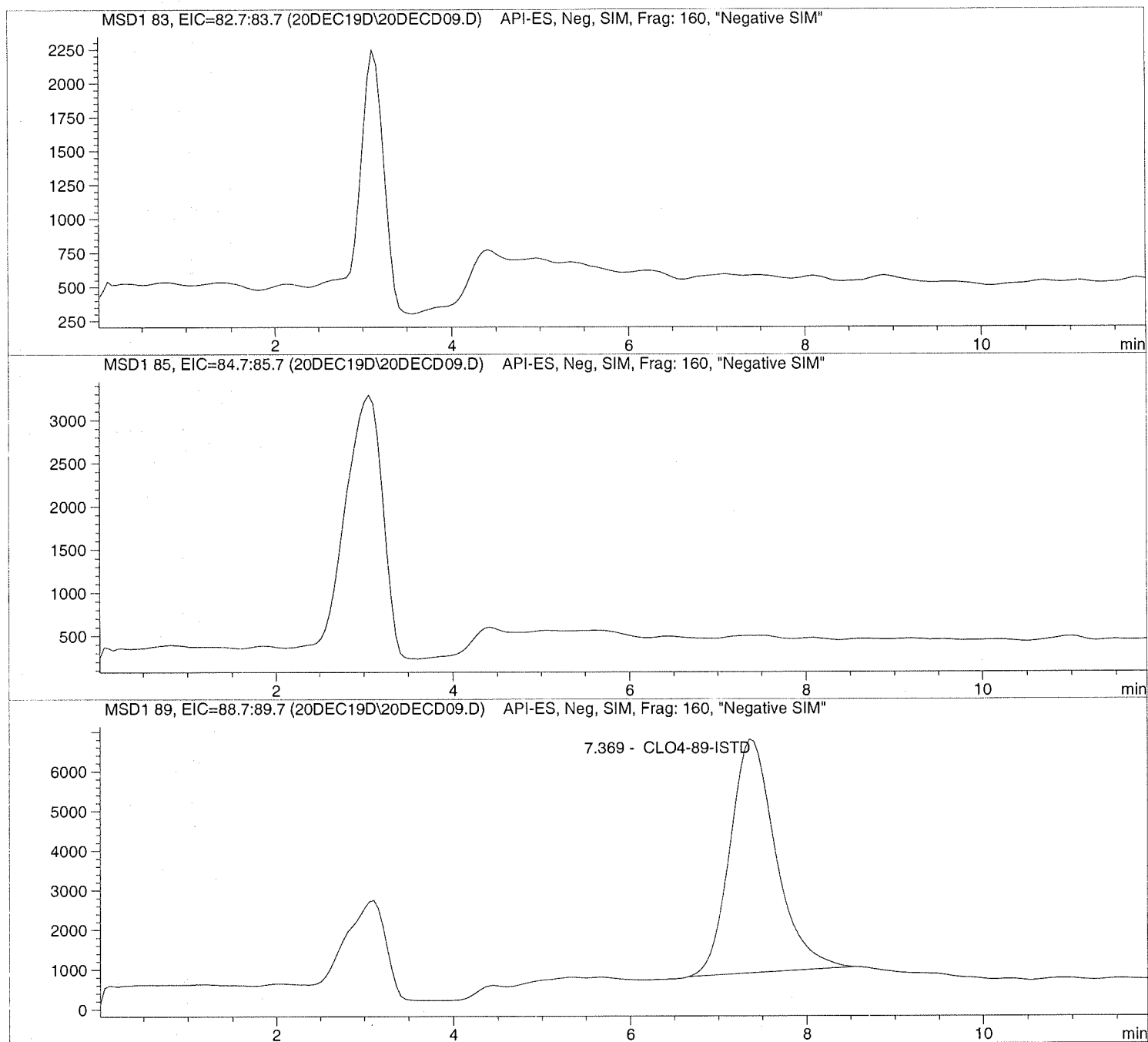
Sample Name: 1934851003

Injection Date: 12/20/2019 15:11:34
Sample Name: 1934851003
Acq Operator: TNB

Seq Line: 9
Location: Vial 79
Inj. No.: 1
Inj. Vol.: 35 μ l

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20DEC19D\20DECD09.D

Sample Name: 1934851003

```

=====
Injection Date: 12/20/2019 15:11:34      Seq Line:          9
Sample Name:   1934851003                Location:         Vial 79
Acq Operator:  TNB                       Inj. No.:        1
                                           Inj. Vol.:       35 µl
=====

```

```

Acq. Method:   CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:  11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  0.000
=====

```

```

=====
                          LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.369	PBA	213267.4	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\20DEC19D\20DECD10.D

Sample Name: 1934851004

Injection Date: 12/20/2019 15:25:34

Seq Line: 10

Sample Name: 1934851004

Location: Vial 80

Acq Operator: TNB

Inj. No.: 1

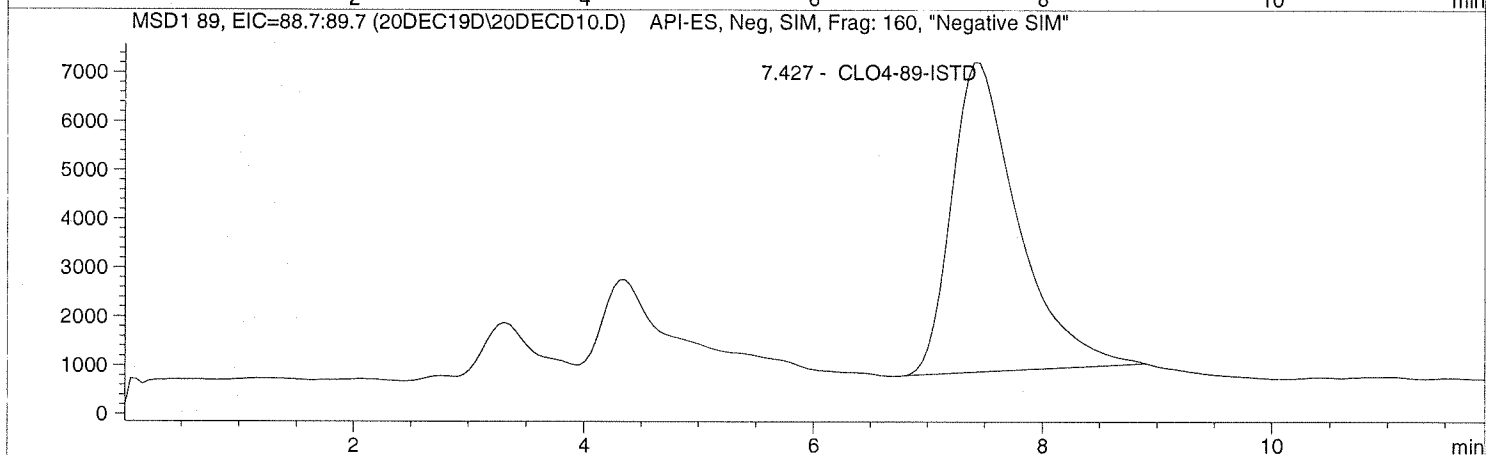
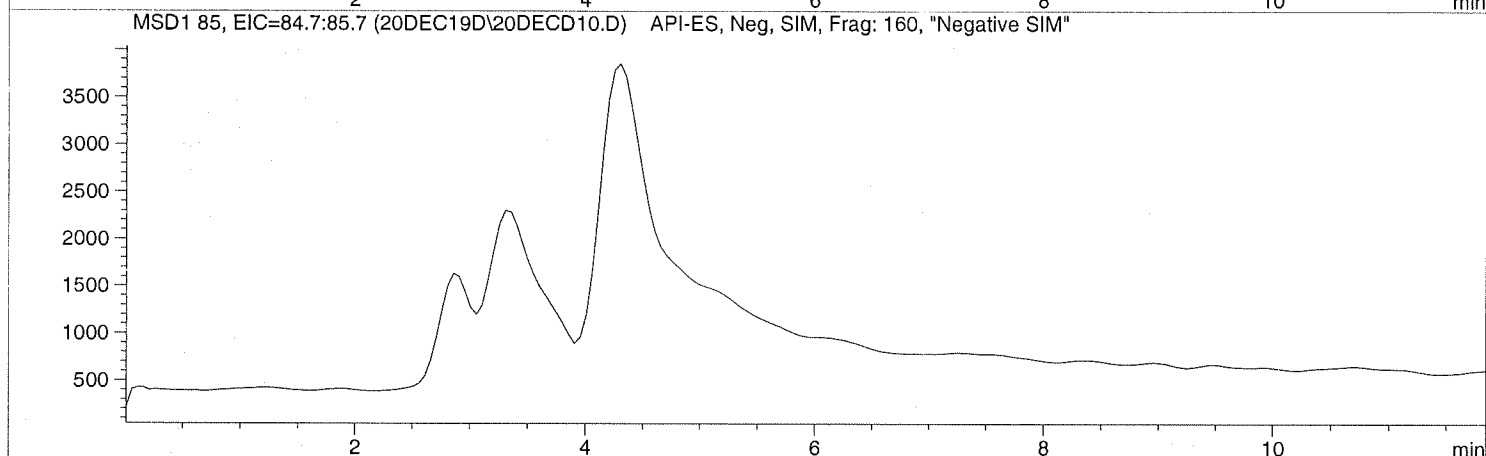
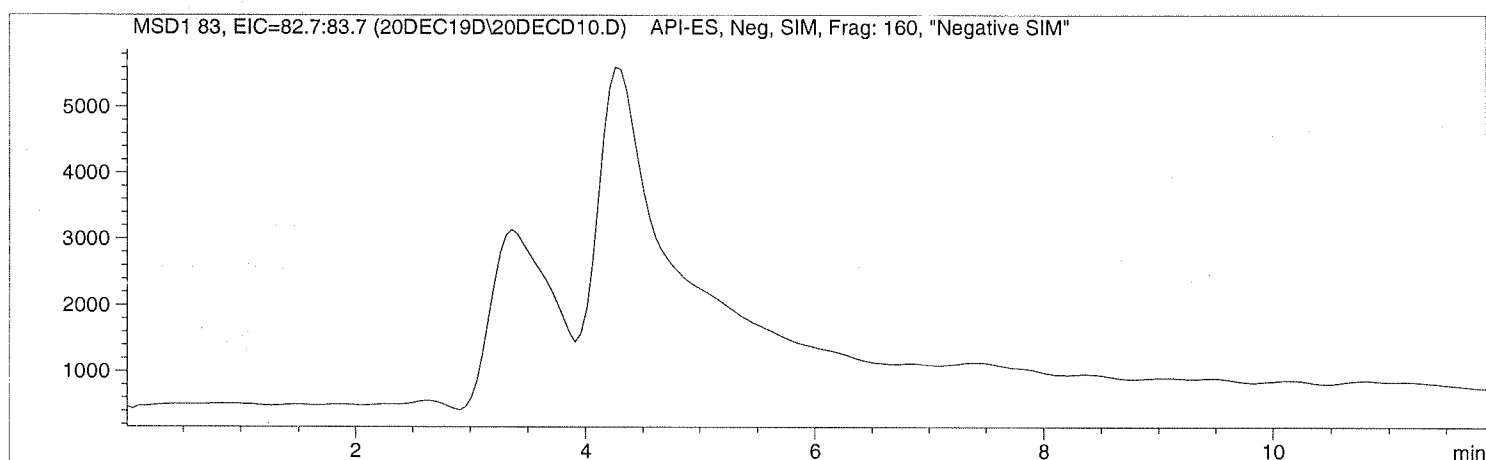
Inj. Vol.: 35 μ l

Acq. Method: CLO4-AQN.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M

Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20DEC19D\20DEC10.D Sample Name: 1934851004

```

=====
Injection Date: 12/20/2019 15:25:34      Seq Line: 10
Sample Name: 1934851004                  Location: Vial 80
Acq Operator: TNB                        Inj. No.: 1
                                           Inj. Vol.: 35 µl
=====

```

```

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By: Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 0.000
=====

```

```

=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.427	PBA	255177.9	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\20DEC19D\20DECD11.D

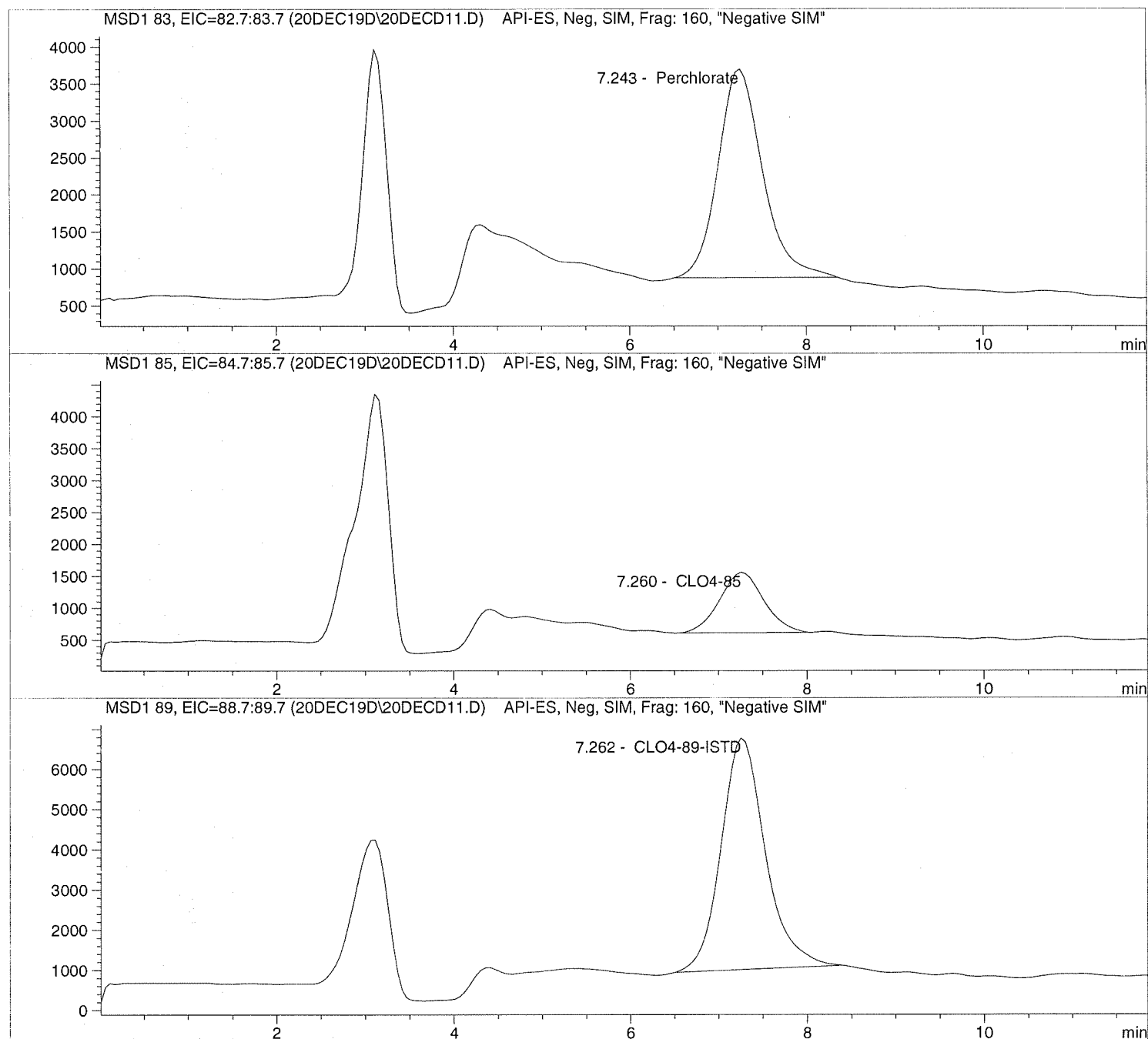
Sample Name: 1934851005

Injection Date: 12/20/2019 15:39:24
Sample Name: 1934851005
Acq Operator: TNB

Seq Line: 11
Location: Vial 81
Inj. No.: 1
Inj. Vol.: 35 μ l

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20DEC19D\20DEC11.D Sample Name: 1934851005

```

=====
Injection Date: 12/20/2019 15:39:24      Seq Line:      11
Sample Name:   1934851005                Location:      Vial 81
Acq Operator:  TNB                       Inj. No.:     1
                                           Inj. Vol.:    35 µl
=====

```

```

Acq. Method:   CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:  11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:    1.000000
Dilution:      1.000000
Sample Amount: 0.000
=====

```

```

=====
                          LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.243	PBA	98345.9	1.7879	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.260	PBA	32799.0	1.8724	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.262	PBA	199853.9	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

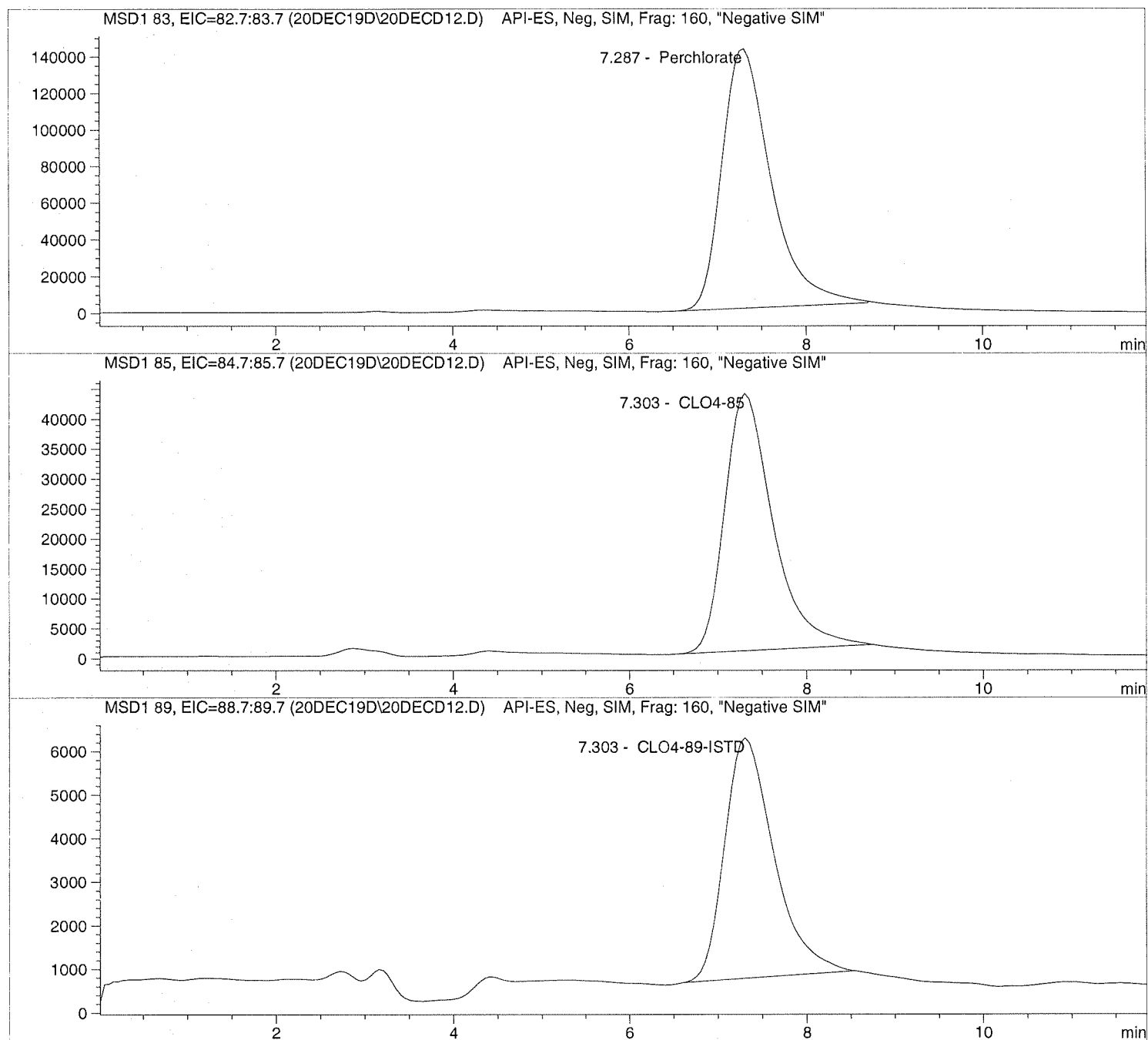
Data file: C:\HPCHEM\1\DATA\20DEC19D\20DECD12.D

Sample Name: 1934851006

```
=====
Injection Date: 12/20/2019 15:53:16      Seq Line: 12
Sample Name: 1934851006                  Location: Vial 82
Acq Operator: TNB                        Inj. No.: 1
                                           Inj. Vol.: 35 µl
=====
```

```
Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45
```

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20DEC19D\20DECD12.D Sample Name: 1934851006

```

=====
Injection Date: 12/20/2019 15:53:16      Seq Line:      12
Sample Name:    1934851006                Location:      Vial 82
Acq Operator:   TNB                       Inj. No.:     1
                                           Inj. Vol.:    35 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  0.000
=====

```

```

=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.287	PBA	5442572.0	72.5354	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.303	PBA	1626533.5	72.0976	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.303	PBA	213698.1	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\20DEC19D\20DECD13.D

Sample Name: 1934851007 100

Injection Date: 12/20/2019 16:07:07

Seq Line: 13

Sample Name: 1934851007 100

Location: Vial 83

Acq Operator: TNB

Inj. No.: 1

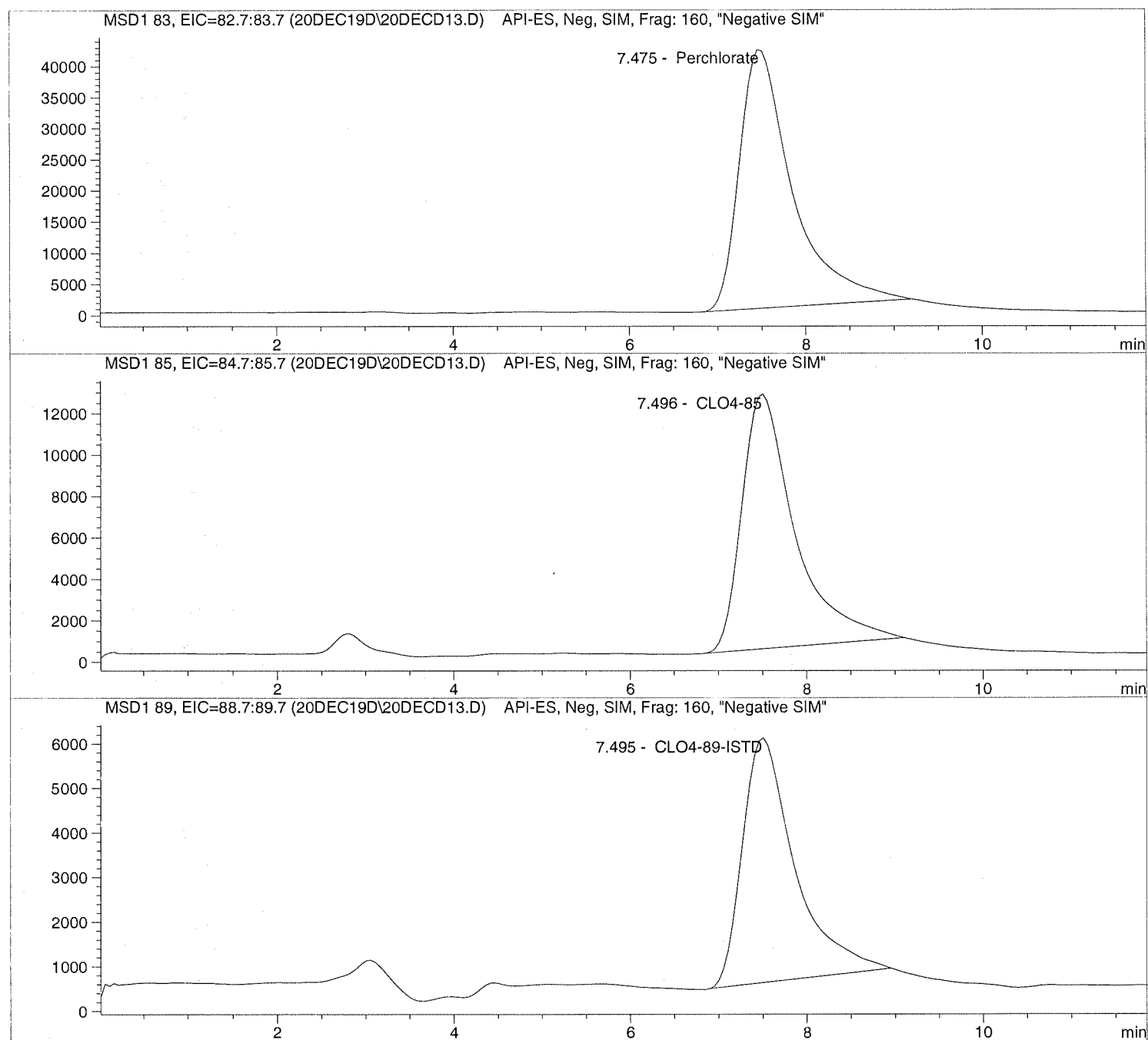
Inj. Vol.: 35 μ l

Acq. Method: CLO4-AQN.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M

Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20DEC19D\20DECD13.D Sample Name: 1934851007 100

```

=====
Injection Date: 12/20/2019 16:07:07      Seq Line: 13
Sample Name: 1934851007 100              Location: Vial 83
Acq Operator: TNB                        Inj. No.: 1
                                           Inj. Vol.: 35 µl
=====

```

```

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By: Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier: 1.000000
Dilution: 100.000000
Sample Amount: 0.000
=====

```

```

=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.475	PBA	1739525.5	2605.9612	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.496	PBA	514969.0	2537.4708	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.495	PBA	227091.5	500.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\20DEC19D\20DEC14.D

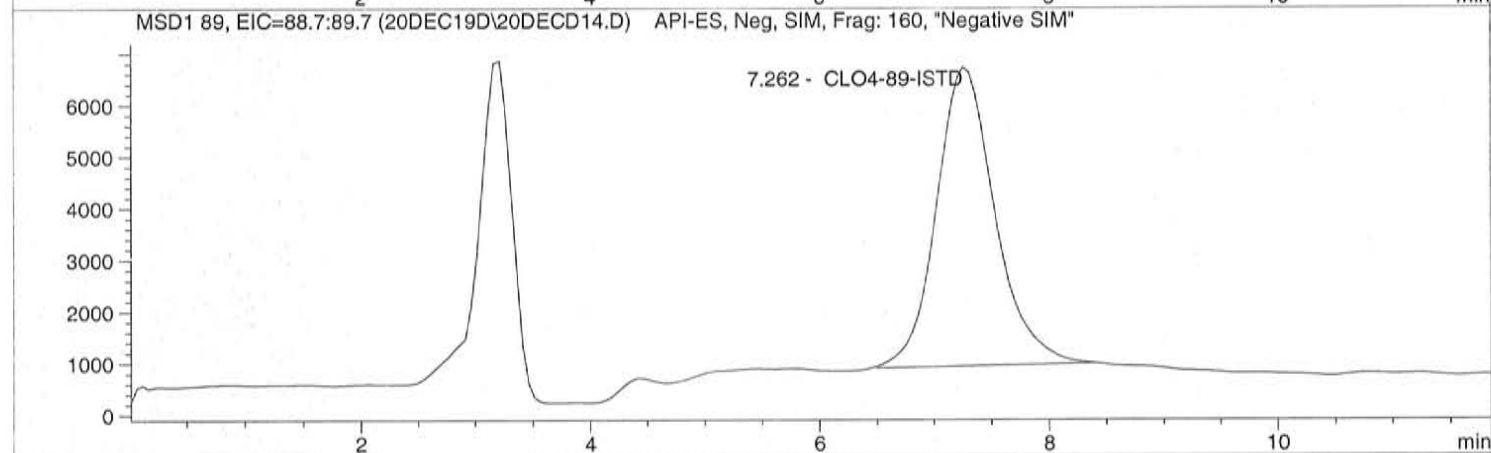
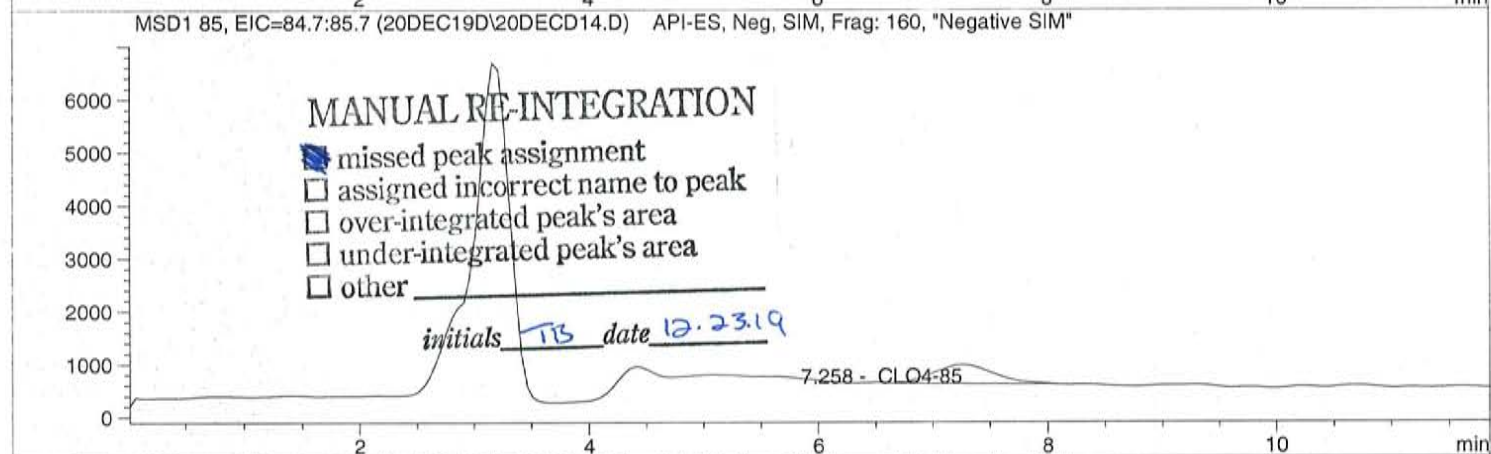
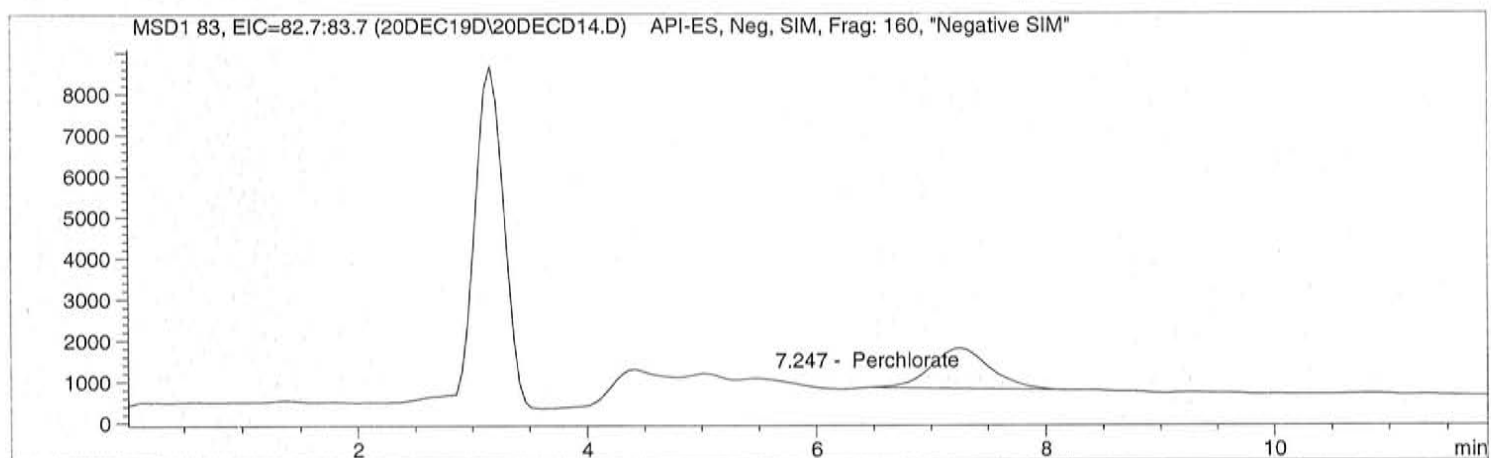
Sample Name: 1935316001

Injection Date: 12/20/2019 16:20:57
 Sample Name: 1935316001
 Acq Operator: TNB

Seq Line: 14
 Location: Vial 84
 Inj. No.: 1
 Inj. Vol.: 35 μ l

Acq. Method: CLO4-AQN.M
 Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
 Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20DEC19D\20DECD14.D Sample Name: 1935316001

```

=====
Injection Date: 12/20/2019 16:20:57      Seq Line: 14
Sample Name: 1935316001                  Location: Vial 84
Acq Operator: TNB                        Inj. No.: 1
                                           Inj. Vol.: 35 µl
=====

```

```

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By: Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 0.000
=====

```

```

=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.247	PBA	35246.8	0.5749	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.258	MM	13171.3	0.6371	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.262	BBA	204617.7	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\20DEC19D\20DECD15.D

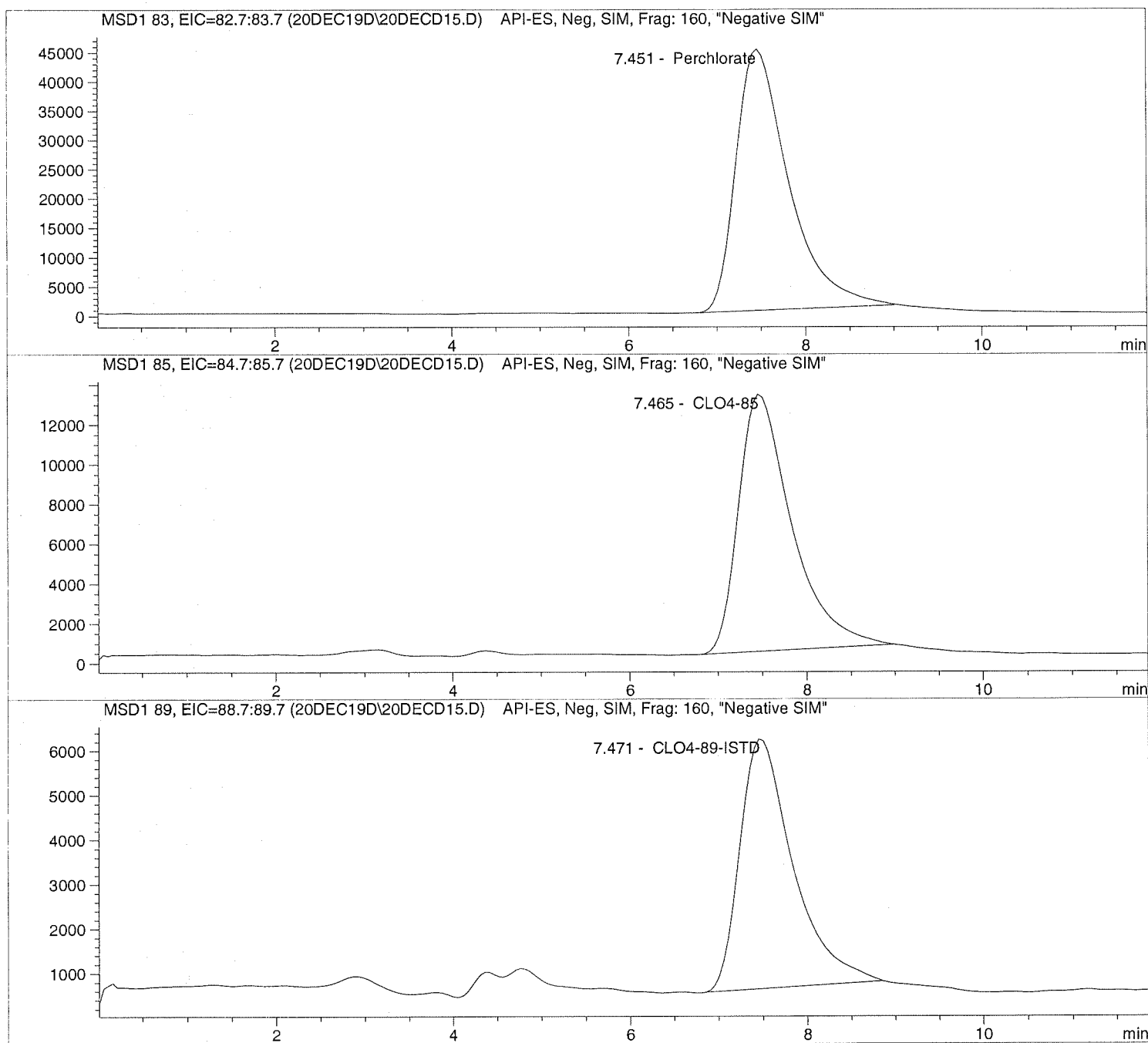
Sample Name: 689414 CCV@25

Injection Date: 12/20/2019 16:34:50
Sample Name: 689414 CCV@25
Acq Operator: TNB

Seq Line: 15
Location: Vial 71
Inj. No.: 1
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20DEC19D\20DEC15.D Sample Name: 689414 CCV@25

```

=====
Injection Date: 12/20/2019 16:34:50                    Seq Line:                    15
Sample Name:    689414    CCV@25                        Location:                    Vial 71
Acq Operator:    TNB                                    Inj. No.:                    1
                                                          Inj. Vol.:                    35 µl

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   11/5/2019 08:44:45

```

Perchlorate analysis

Sample Information

```

Sorted By:                    Signal
Calib. Data Modified:        Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:                  1.000000
Dilution:                    1.000000
Sample Amount:                25.000

```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.451	PBA	1840359.7	26.7545	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.465	PBA	538678.8	25.7913	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.471	PBA	233347.4	5.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\20DEC19D\20DECD16.D

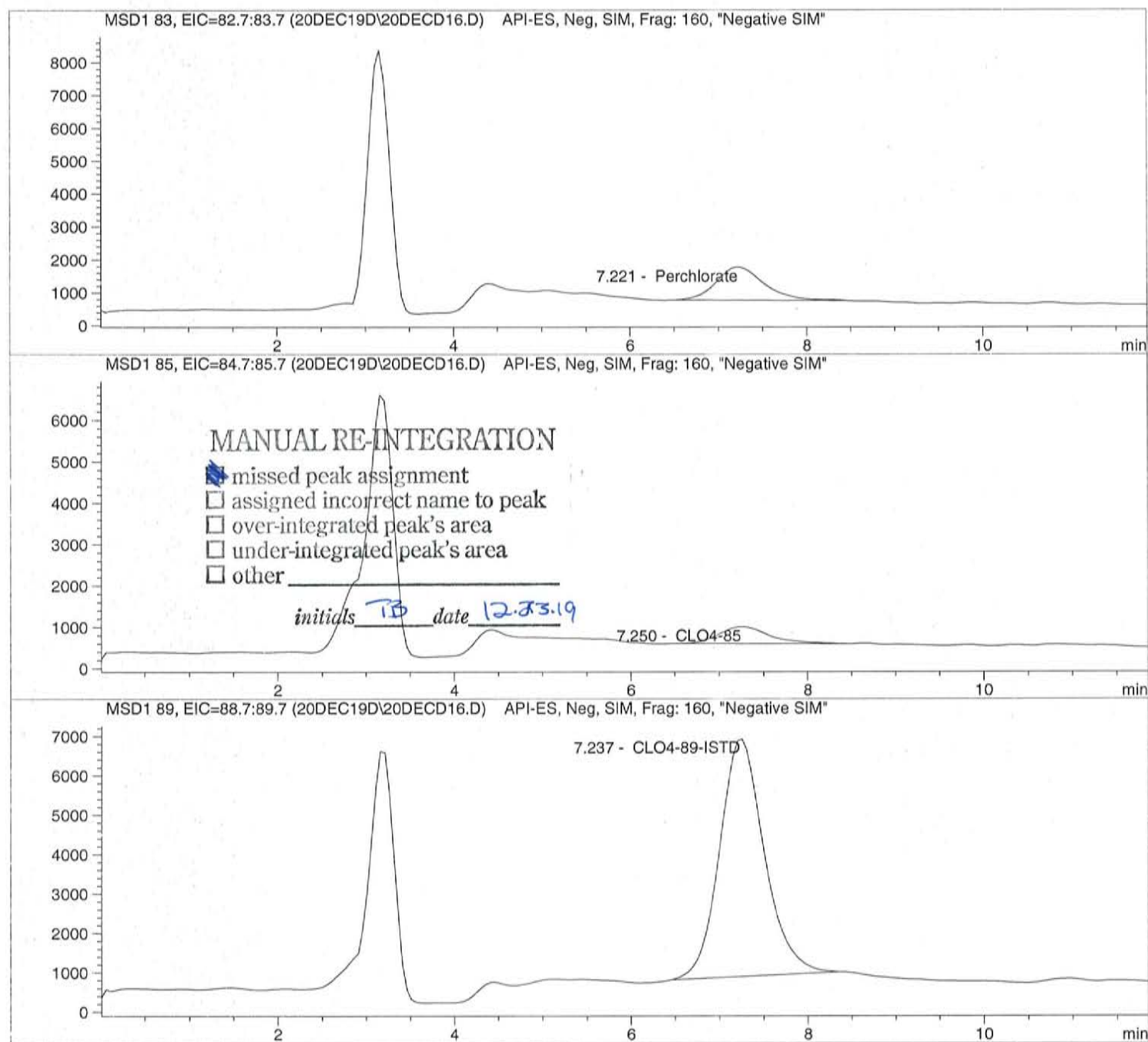
Sample Name: 1935316002

Injection Date: 12/20/2019 16:48:43
 Sample Name: 1935316002
 Acq Operator: TNB

Seq Line: 16
 Location: Vial 85
 Inj. No.: 1
 Inj. Vol.: 35 μ l

Acq. Method: CLO4-AQN.M
 Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
 Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20DEC19D\20DEC16.D Sample Name: 1935316002

```

=====
Injection Date: 12/20/2019 16:48:43      Seq Line:          16
Sample Name:   1935316002                Location:          Vial 85
Acq Operator:  TNB                       Inj. No.:         1
                                           Inj. Vol.:        35 µl
=====

```

```

Acq. Method:   CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:  11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:    1.000000
Dilution:      1.000000
Sample Amount: 0.000
=====

```

```

=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.221	PBA	37711.6	0.6019	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.250	MM	16316.8	0.8016	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.237	PBA	210291.4	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\20DEC19D\20DEC17.D

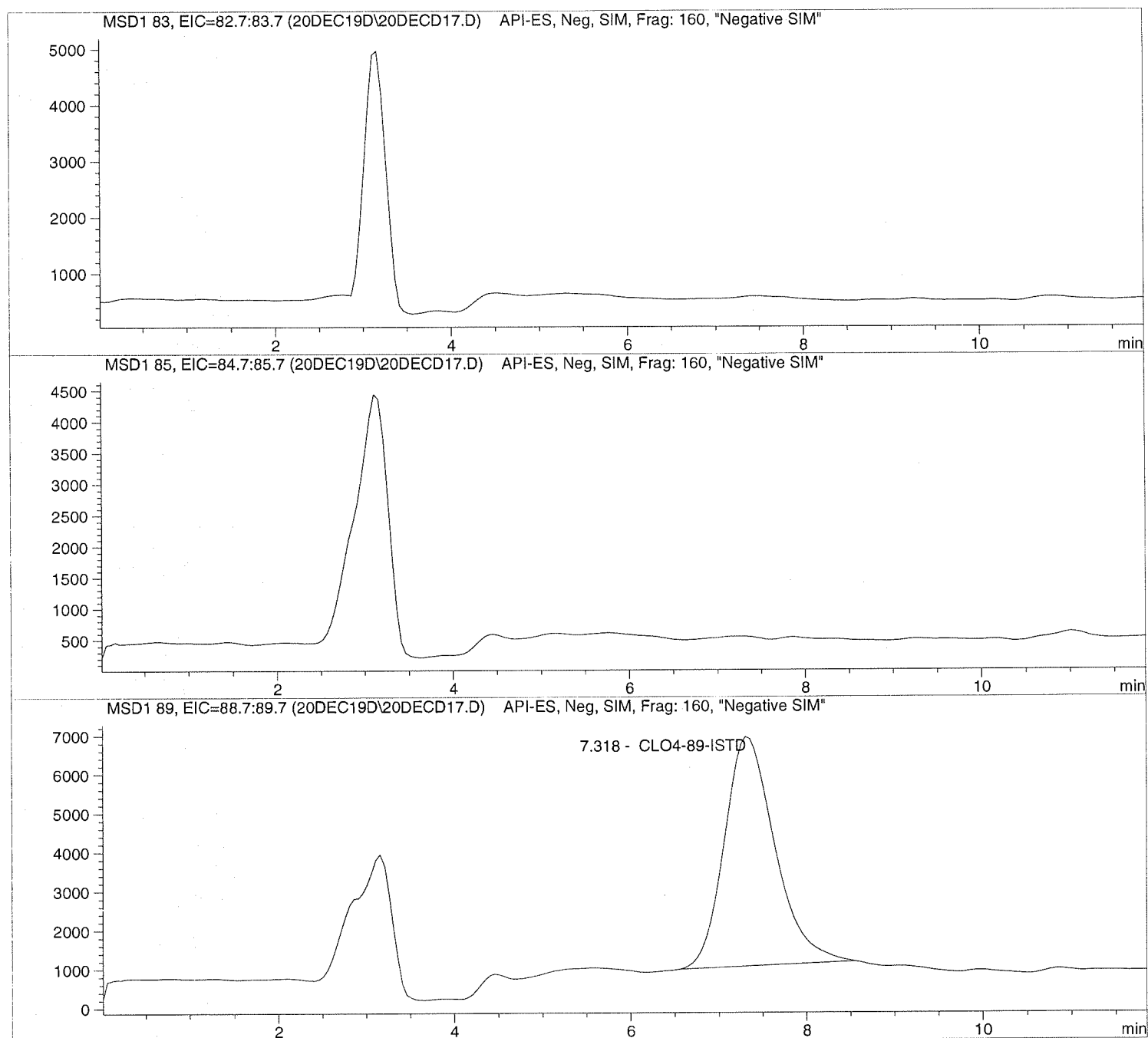
Sample Name: 1935316003

=====
Injection Date: 12/20/2019 17:02:35
Sample Name: 1935316003
Acq Operator: TNB

Seq Line: 17
Location: Vial 86
Inj. No.: 1
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20DEC19D\20DECD17.D

Sample Name: 1935316003

```

=====
Injection Date: 12/20/2019 17:02:35      Seq Line:      17
Sample Name:   1935316003                Location:      Vial 86
Acq Operator:  TNB                       Inj. No.:     1
                                           Inj. Vol.:    35 µl
=====

```

```

Acq. Method:   CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:  11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:    1.000000
Dilution:      1.000000
Sample Amount: 0.000
=====

```

```

=====
                          LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.318	PBA	235611.6	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\20DEC19D\20DECD18.D

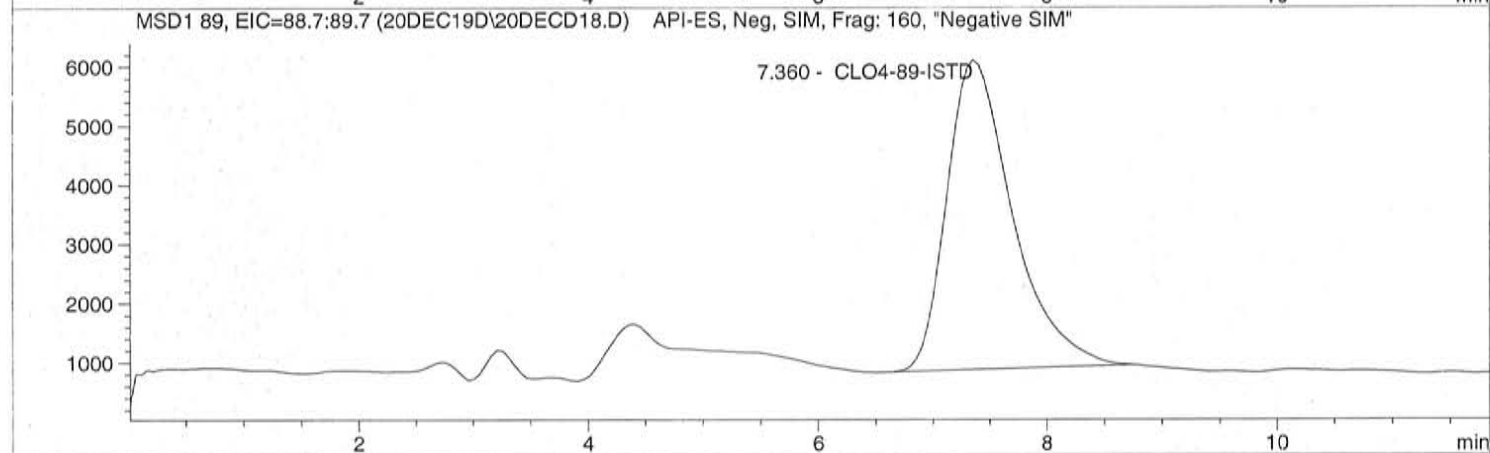
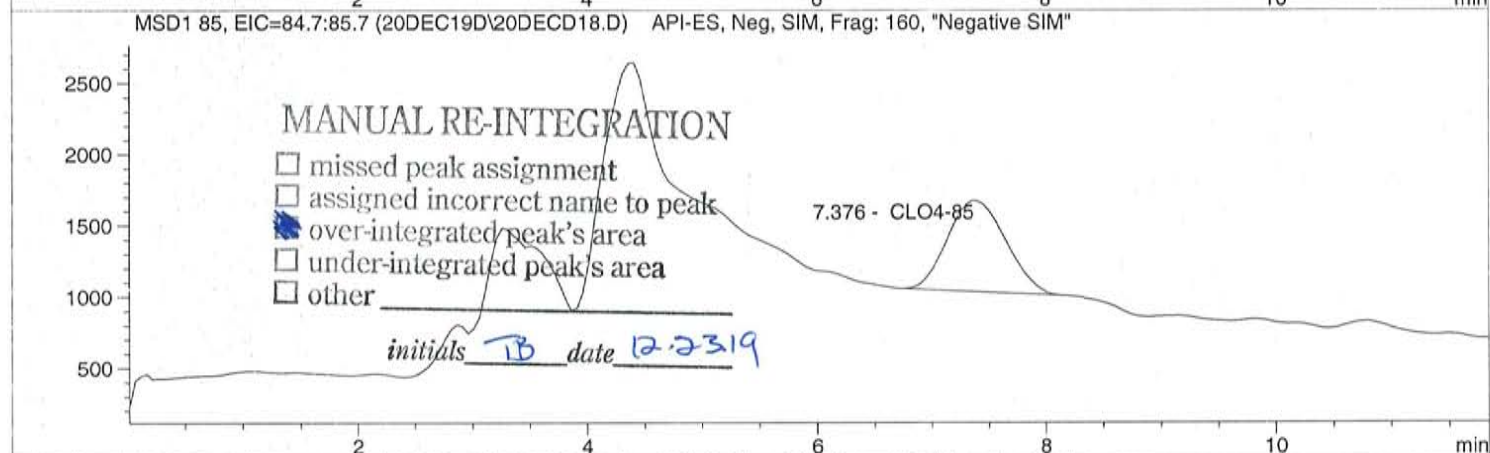
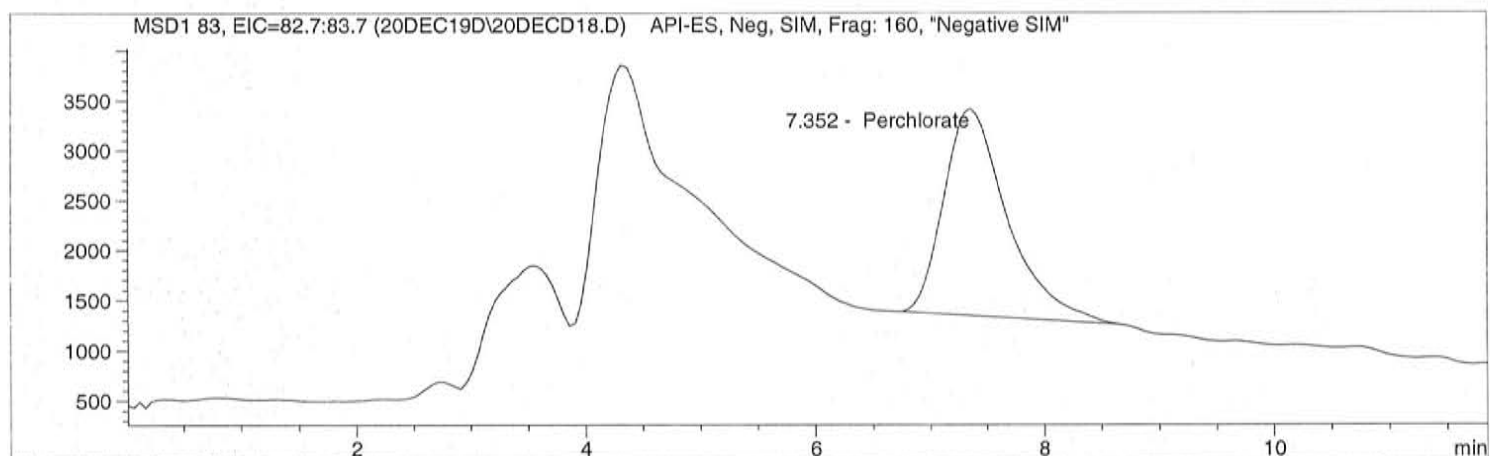
Sample Name: 1935316004

Injection Date: 12/20/2019 17:16:32
 Sample Name: 1935316004
 Acq Operator: TNB

Seq Line: 18
 Location: Vial 87
 Inj. No.: 1
 Inj. Vol.: 35 μ l

Acq. Method: CLO4-AQN.M
 Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
 Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20DEC19D\20DEC18.D Sample Name: 1935316004

```

=====
Injection Date: 12/20/2019 17:16:32      Seq Line:          18
Sample Name:    1935316004                Location:          Vial 87
Acq Operator:   TNB                       Inj. No.:         1
                                           Inj. Vol.:        35 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  0.000
=====

```

```

=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.352	PBA	79516.8	1.3684	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.376	MM	22677.9	1.1875	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.360	PBA	208671.3	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\20DEC19D\20DEC19.D

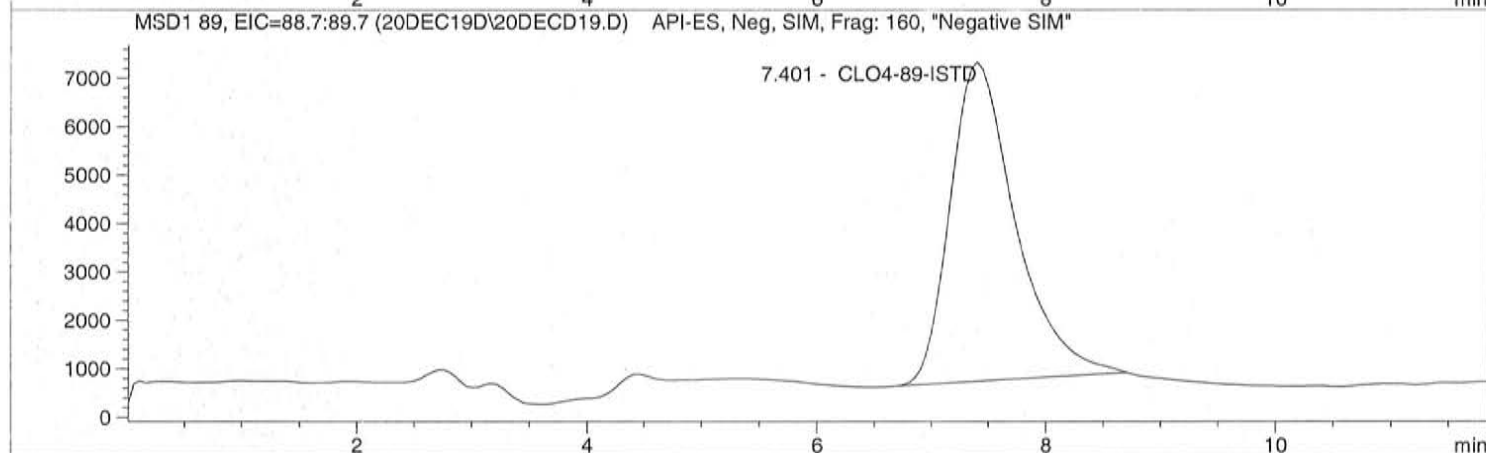
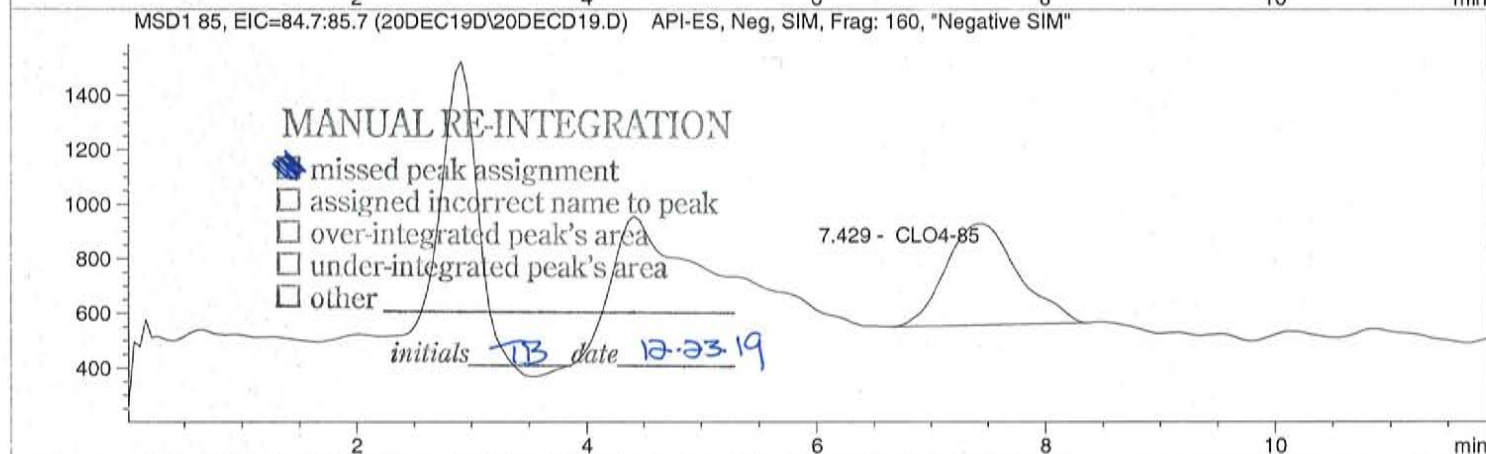
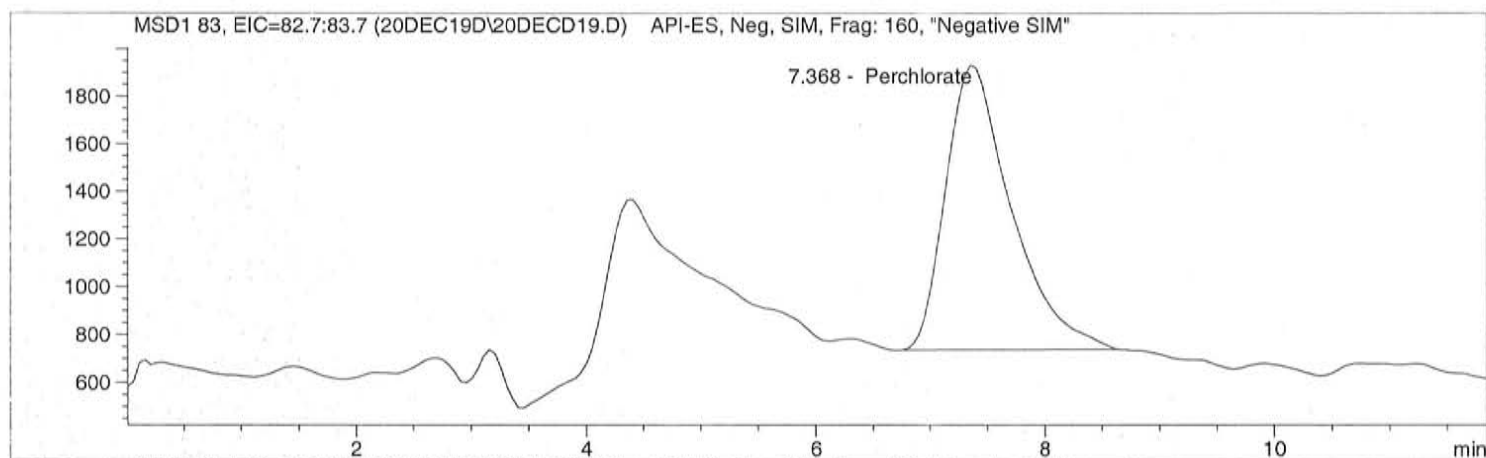
Sample Name: 1935343001

Injection Date: 12/20/2019 17:30:23
Sample Name: 1935343001
Acq Operator: TNB

Seq Line: 19
Location: Vial 88
Inj. No.: 1
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20DEC19D\20DECD19.D

Sample Name: 1935343001

```

=====
Injection Date: 12/20/2019 17:30:23      Seq Line:          19
Sample Name:   1935343001                Location:         Vial 88
Acq Operator:  TNB                       Inj. No.:        1
                                           Inj. Vol.:       35 µl
=====

```

```

Acq. Method:   CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:  11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  0.000
=====

```

```

=====
                          LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.368	PBA	47484.7	0.6123	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.429	MM	16333.7	0.6154	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.401	PBA	260797.0	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\20DEC19D\20DECD20.D

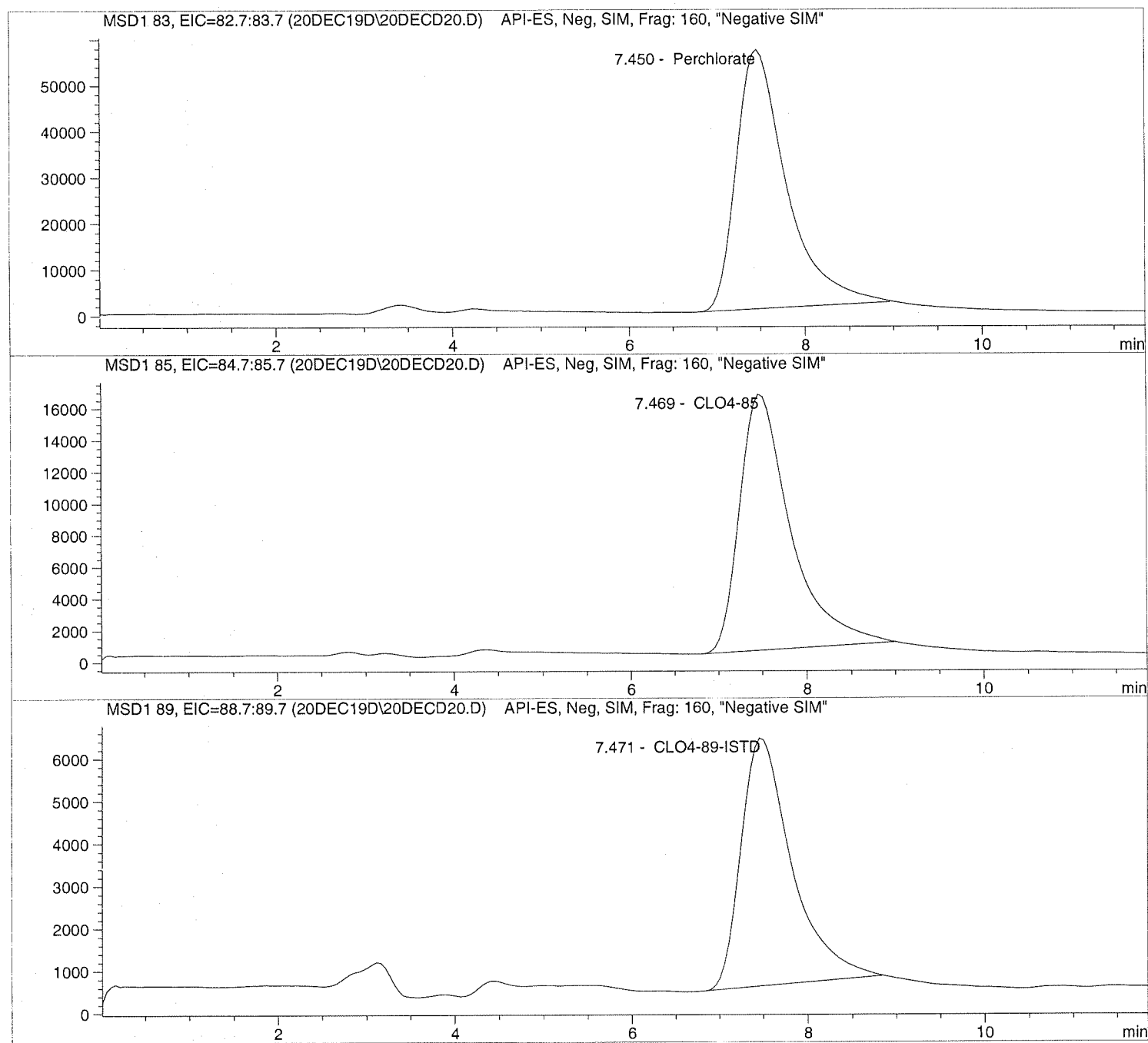
Sample Name: 1935343002

=====
Injection Date: 12/20/2019 17:44:18
Sample Name: 1935343002
Acq Operator: TNB

Seq Line: 20
Location: Vial 89
Inj. No.: 1
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20DEC19D\20DECD20.D

Sample Name: 1935343002

```

=====
Injection Date: 12/20/2019 17:44:18      Seq Line: 20
Sample Name:    1935343002                Location:  Vial 89
Acq Operator:   TNB                       Inj. No.: 1
                                           Inj. Vol.: 35 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  0.000
=====

```

```

=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.450	PBA	2218208.3	31.6741	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.469	PBA	646837.8	30.4960	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.471	PBA	232847.2	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\20DEC19D\20DECD21.D

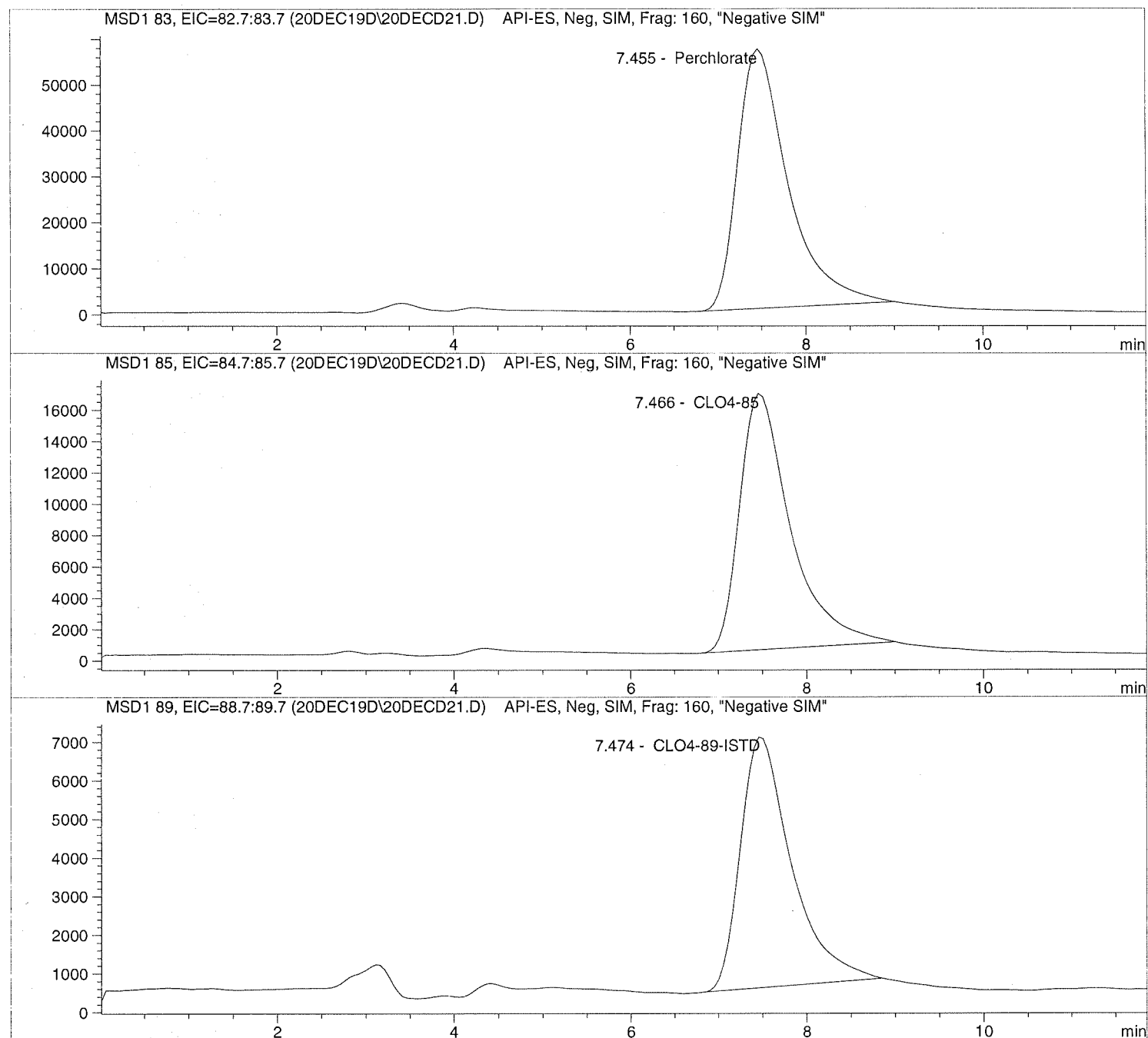
Sample Name: 1935343003

Injection Date: 12/20/2019 17:58:10
Sample Name: 1935343003
Acq Operator: TNB

Seq Line: 21
Location: Vial 90
Inj. No.: 1
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20DEC19D\20DECD21.D Sample Name: 1935343003

```

=====
Injection Date: 12/20/2019 17:58:10      Seq Line:          21
Sample Name:   1935343003                Location:         Vial 90
Acq Operator:  TNB                       Inj. No.:        1
                                           Inj. Vol.:       35 µl
=====

```

```

Acq. Method:   CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:  11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  0.000
=====

```

```

=====
                          LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.455	PBA	2245223.3	28.9532	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.466	PBA	655399.1	27.8698	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.474	PBA	260703.4	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\20DEC19D\20DECD22.D

Sample Name: 1935343004 1K

Injection Date: 12/20/2019 18:12:05

Seq Line: 22

Sample Name: 1935343004 1K

Location: Vial 91

Acq Operator: TNB

Inj. No.: 1

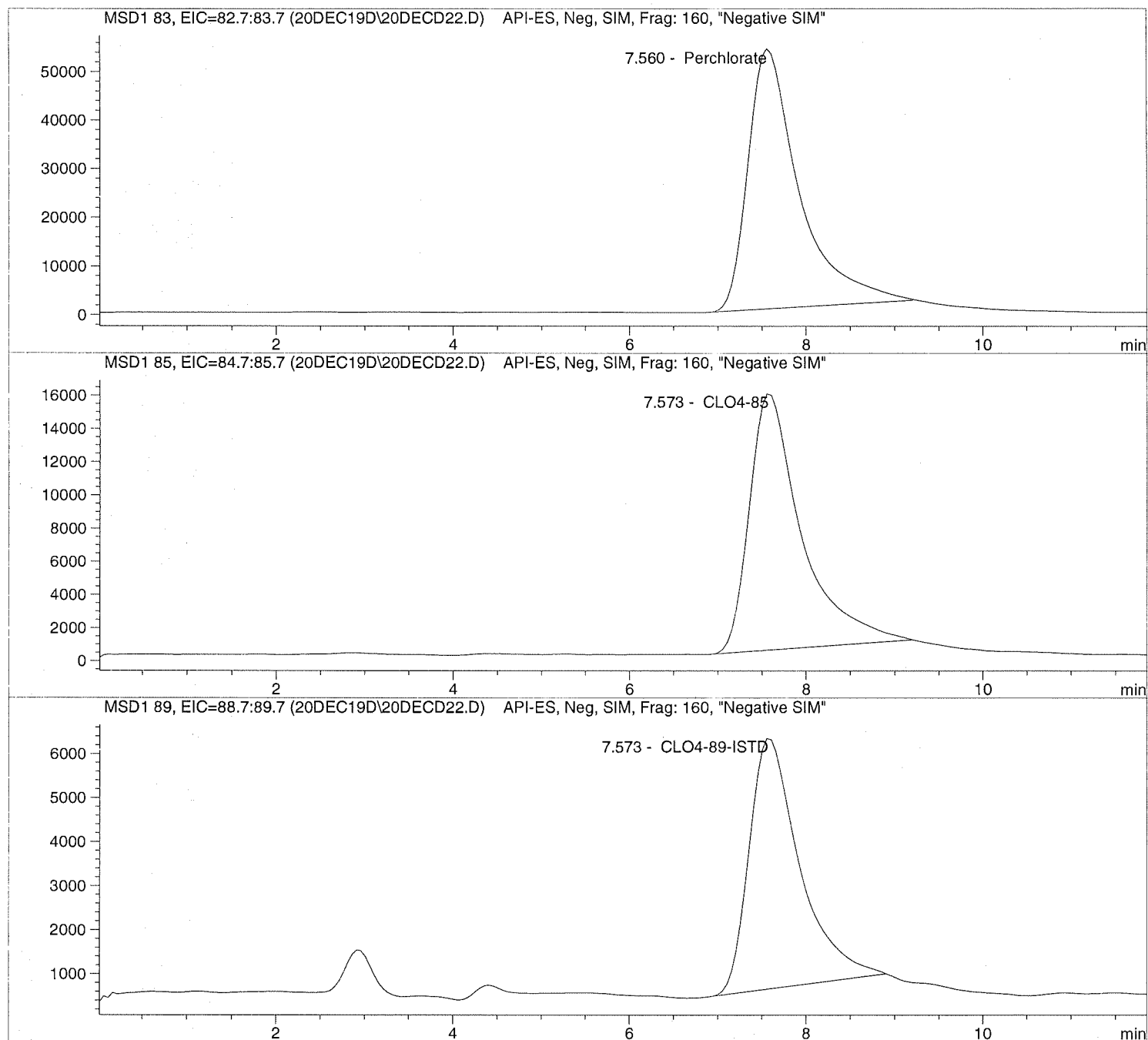
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M

Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20DEC19D\20DECD22.D Sample Name: 1935343004 1K

```

=====
Injection Date: 12/20/2019 18:12:05      Seq Line:          22
Sample Name:    1935343004 1K            Location:          Vial 91
Acq Operator:   TNB                      Inj. No.:         1
                                           Inj. Vol.:       35 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1000.000000
Sample Amount:  0.000
=====

```

```

=====
                          LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.560	PBA	2155972.7	31691.1790	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.573	PBA	633070.0	30703.4059	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.573	PBA	226176.3	5000.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

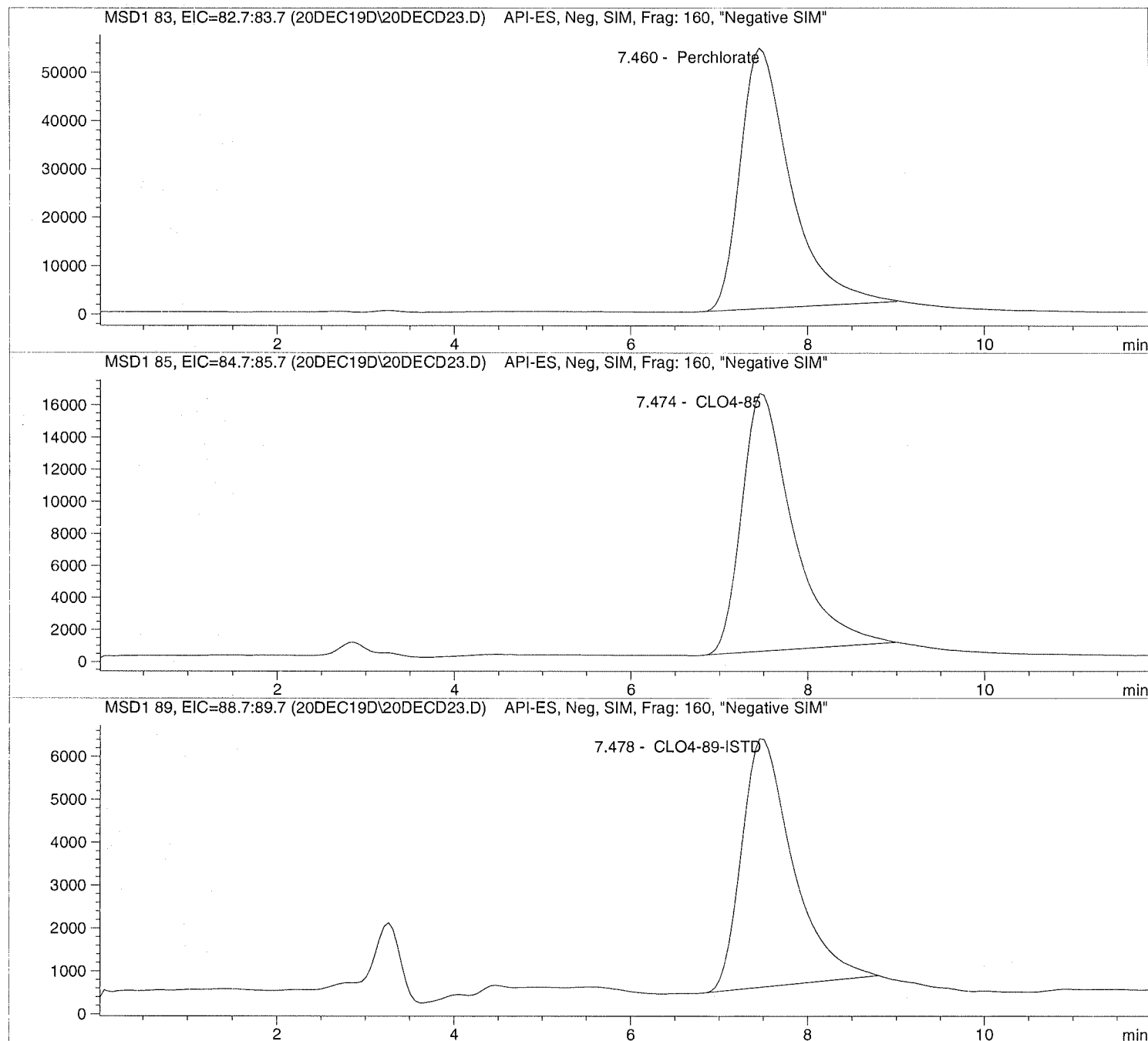
```

Data file: C:\HPCHEM\1\DATA\20DEC19D\20DECD23.D Sample Name: 1935343005 10X

```
=====
Injection Date: 12/20/2019 18:25:57      Seq Line:      23
Sample Name:    1935343005 10X           Location:      Vial 92
Acq Operator:   TNB                      Inj. No.:     1
                                           Inj. Vol.:    35 µl
=====
```

```
Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   11/5/2019 08:44:45
```

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20DEC19D\20DECD23.D Sample Name: 1935343005 10X

```

=====
Injection Date: 12/20/2019 18:25:57      Seq Line:      23
Sample Name:   1935343005 10X           Location:      Vial 92
Acq Operator:  TNB                      Inj. No.:     1
                                           Inj. Vol.:    35 µl
=====

```

```

Acq. Method:   CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:  11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       10.000000
Sample Amount:  0.000
=====

```

```

=====
                          LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.460	PBA	2142509.0	306.2809	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.474	PBA	646073.3	303.7870	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.478	PBA	233571.8	50.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

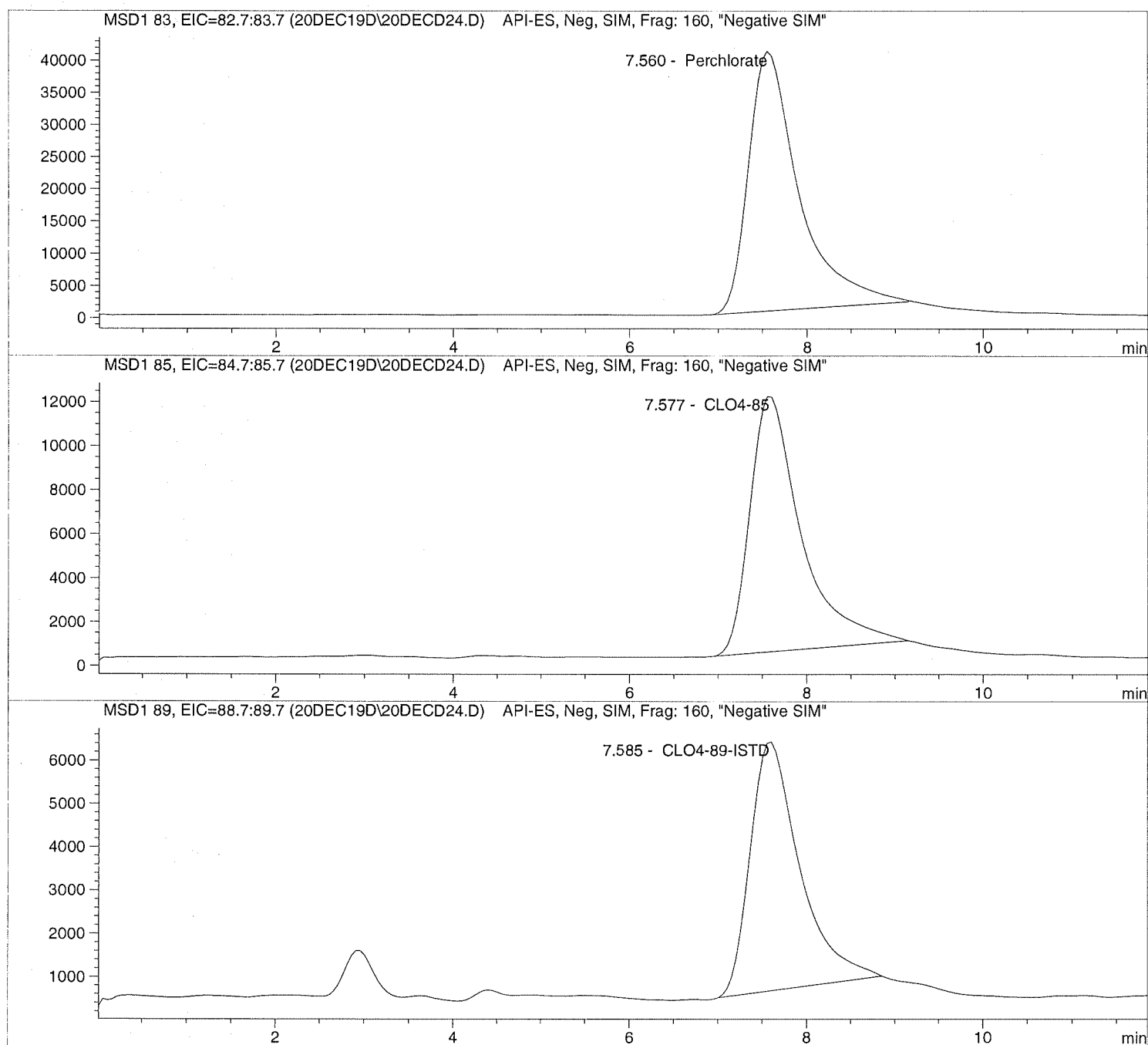
```

Data file: C:\HPCHEM\1\DATA\20DEC19D\20DECD24.D Sample Name: 1935343006 1K

```
=====
Injection Date: 12/20/2019 18:39:48      Seq Line:      24
Sample Name:    1935343006 1K            Location:      Vial 93
Acq Operator:   TNB                      Inj. No.:     1
                                           Inj. Vol.:    35 µl
=====
```

```
Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   11/5/2019 08:44:45
```

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20DEC19D\20DECD24.D Sample Name: 1935343006 1K

```
=====
Injection Date: 12/20/2019 18:39:48                    Seq Line:                    24
Sample Name:    1935343006    1K                    Location:                    Vial 93
Acq Operator:    TNB                                    Inj. No.:                    1
                                                          Inj. Vol.:                    35 µl
=====
```

```
Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:    11/5/2019 08:44:45
```

Perchlorate analysis

Sample Information

```
Sorted By:                    Signal
Calib. Data Modified:        Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:                   1.000000
Dilution:                    1000.000000
Sample Amount:                0.000
```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.560	PBA	1595449.5	24449.8022	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.577	PBA	466349.3	23513.4271	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.585	PBA	223474.0	5000.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\20DEC19D\20DECD26.D

Sample Name: 689415 CCV@25

Injection Date: 12/20/2019 19:07:32

Seq Line: 26

Sample Name: 689415 CCV@25

Location: Vial 71

Acq Operator: TNB

Inj. No.: 1

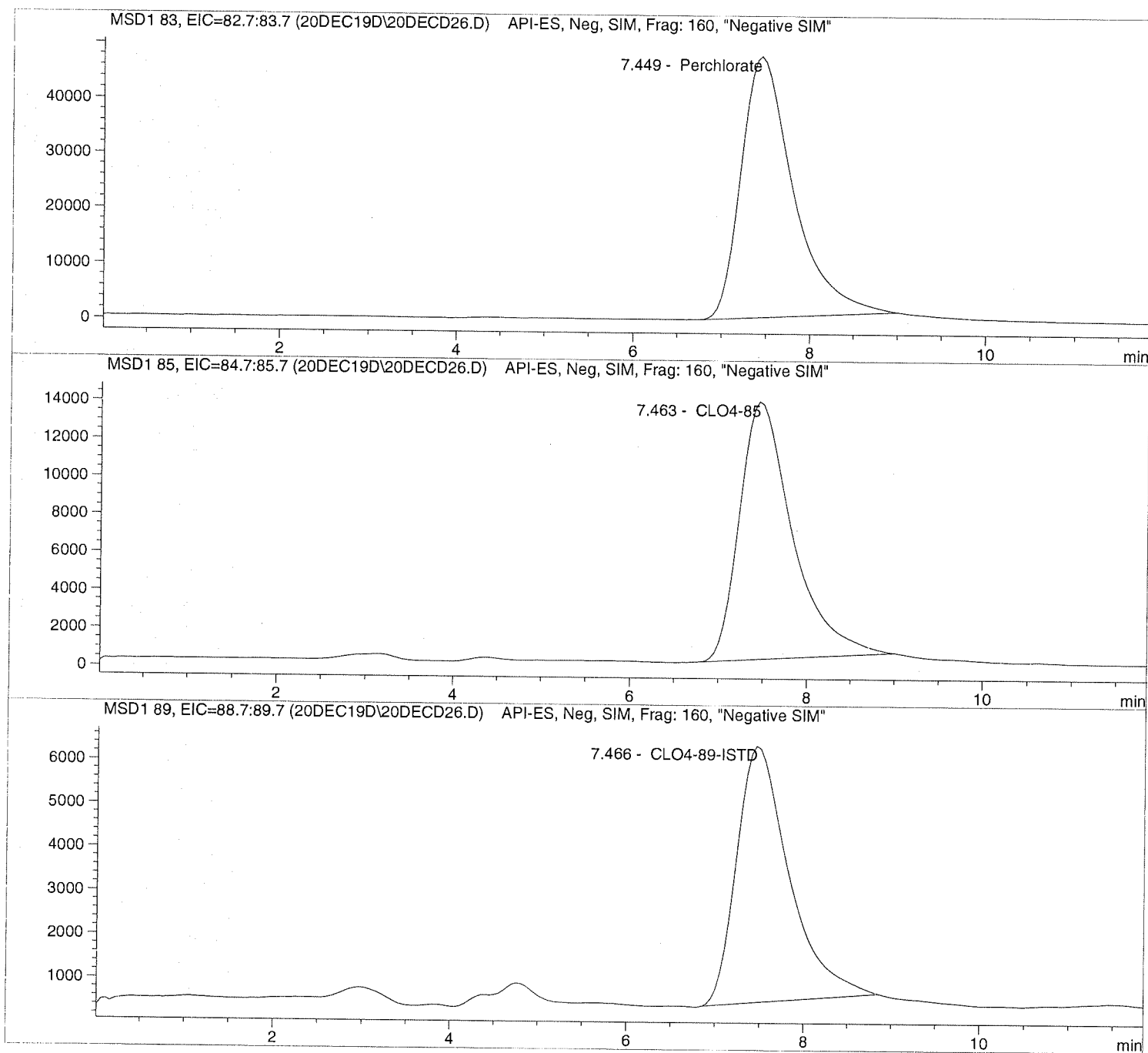
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M

Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20DEC19D\20DECD26.D Sample Name: 689415 CCV@25

```

=====
Injection Date: 12/20/2019 19:07:32      Seq Line:          26
Sample Name:    689415  CCV@25           Location:          Vial 71
Acq Operator:  TNB                       Inj. No.:         1
                                           Inj. Vol.:       35 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   11/5/2019 08:44:45
=====

```

Perchlorate analysis

=====
Sample Information
=====

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:    1.000000
Dilution:      1.000000
Sample Amount: 25.000
=====

```

=====
LCMS Results
=====

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.449	PBA	1939760.0	27.0663	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.463	PBA	567687.4	26.0920	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.466	PBA	242806.7	5.0000	CLO4-89-ISTD

=====
*** End of Report ***
=====



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

**Initial
Calibration**

=====
 Calibration Table
 =====

Perchlorate

Calib. Data Modified : 9/23/2019 12:20:59 PM

Calculate : Internal Standard
 Based on : Peak Area

Rel. Reference Window : 20.000 %
 Abs. Reference Window : 0.000 min
 Rel. Non-ref. Window : 20.000 %
 Abs. Non-ref. Window : 0.000 min

Use Multiplier & Dilution Factor with ISTDs
 Uncalibrated Peaks : not reported
 Partial Calibration : No recalibration if peaks missing

Curve Type : Quadratic (some peaks differ, see below)
 Origin : Ignored (some peaks differ, see below)
 Weight : Linear (Amnt) (some peaks differ, see below)

Recalibration Settings:
 Average Response : Average all calibrations
 Average Retention Time: Floating Average New 75%

Calibration Report Options :
 Printout of recalibrations within a sequence:
 Calibration Table after Recalibration
 Normal Report after Recalibration
 If the sequence is done with bracketing:
 Results of first cycle (ending previous bracket)

Default Sample ISTD Information (if not set in sample table):

ISTD #	ISTD Amount	Name
1	5.00000	CLO4-89-ISTD

Signal 1: MSD1 83, EIC=82.7:83.7
 Signal 2: MSD1 85, EIC=84.7:85.7
 Signal 3: MSD1 89, EIC=88.7:89.7

RetTime [min]	Lvl	Sig	Amount	Area	Amt/Area	Ref	Grp	Name
7.750	1	3	1.00000	5.39218e4	1.85454e-5	1		Perchlorate
		4	2.00000	1.32825e5	1.50574e-5			
		5	5.00000	2.76271e5	1.80982e-5			
		6	10.00000	5.61298e5	1.78159e-5			
		7	25.00000	1.51820e6	1.64669e-5			
		8	50.00000	3.31156e6	1.50986e-5			
		9	75.00000	5.23914e6	1.43153e-5			
7.767	3	3	5.00000	2.14568e5	2.33026e-5	+I1		CLO4-89-ISTD
		4	5.00000	2.04758e5	2.44190e-5			
		5	5.00000	2.13407e5	2.34294e-5			
		6	5.00000	2.09246e5	2.38953e-5			
		7	5.00000	2.07403e5	2.41077e-5			
		8	5.00000	2.02929e5	2.46391e-5			
		9	5.00000	1.97933e5	2.52611e-5			
7.778	2	3	1.00000	1.70436e4	5.86732e-5	1		CLO4-85
		4	2.00000	4.20754e4	4.75337e-5			
		5	5.00000	9.24707e4	5.40712e-5			
		6	10.00000	1.68622e5	5.93041e-5			
		7	25.00000	4.63724e5	5.39114e-5			
		8	50.00000	9.95933e5	5.02042e-5			

Method C:\HPCHEM\1\METHODS\CLO4-DP3.M

RetTime [min]	Lvl Sig	Amount	Area	Amt/Area	Ref Grp Name
9		75.00000	1.58066e6	4.74484e-5	

More compound-specific settings:

Compound: Perchlorate

Time Window : From 3.581 min To 11.899 min
 Curve Type : Quadratic
 Origin : Ignored
 Calibration Level Weights:/
 Level 3 : 1
 Level 4 : 0.5
 Level 5 : 0.2
 Level 6 : 0.1
 Level 7 : 0.04
 Level 8 : 0.02
 Level 9 : 0.013333

Compound: CLO4-89-ISTD

Time Window : From 3.581 min To 11.896 min
 Curve Type : Linear
 Origin : Included
 Calibration Level Weights:/
 Level 3 : 1
 Level 4 : 1
 Level 5 : 1
 Level 6 : 1
 Level 7 : 1
 Level 8 : 1
 Level 9 : 1

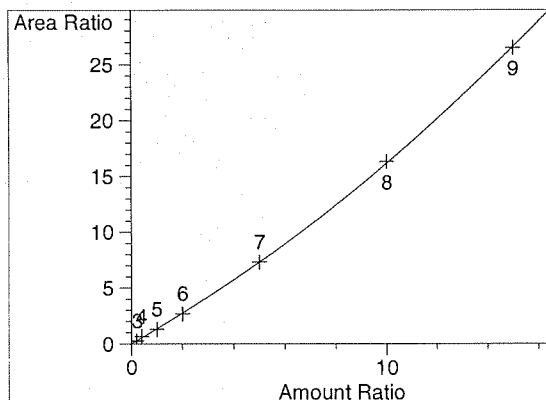
Compound: CLO4-85

Time Window : From 3.601 min To 11.913 min
 Curve Type : Quadratic
 Origin : Ignored
 Calibration Level Weights:/
 Level 3 : 1
 Level 4 : 0.5
 Level 5 : 0.2
 Level 6 : 0.1
 Level 7 : 0.04
 Level 8 : 0.02
 Level 9 : 0.013333

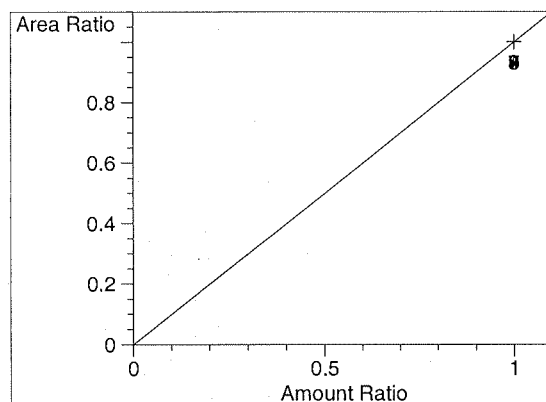
```
=====
                          Peak Sum Table
=====
```

```
***No Entries in table***
=====
```

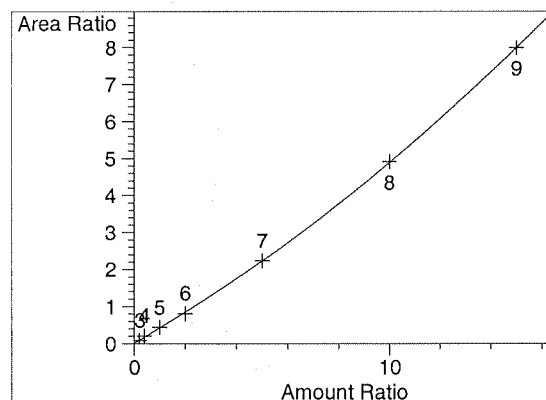
Method C:\HPCHEM\1\METHODS\CLO4-DP3.M

 =====
 Calibration Curves
 =====


Perchlorate at exp. RT: 7.750
 MSD1 83, EIC=82.7:83.7
 Correlation: 0.99975
 Residual Std. Dev.: 0.10284
 Formula: $y = ax^2 + bx + c$
 a: 3.10463e-2
 b: 1.30369
 c: 2.19496e-2
 x: Amount Ratio
 y: Area Ratio
 Calibration Level Weights:
 Level 3 : 1
 Level 4 : 0.5
 Level 5 : 0.2
 Level 6 : 0.1
 Level 7 : 0.04
 Level 8 : 0.02
 Level 9 : 0.013333



CLO4-89-ISTD at exp. RT: 7.767
 MSD1 89, EIC=88.7:89.7
 Correlation: 1.00000
 Residual Std. Dev.: 0.00000
 Formula: $y = mx + b$
 m: 1.00000
 b: 0.00000
 x: Amount Ratio
 y: Area Ratio
 Calibration Level Weights:
 Level 3 : 1
 Level 4 : 1
 Level 5 : 1
 Level 6 : 1
 Level 7 : 1
 Level 8 : 1
 Level 9 : 1



CLO4-85 at exp. RT: 7.778
 MSD1 85, EIC=84.7:85.7
 Correlation: 0.99969
 Residual Std. Dev.: 0.02601
 Formula: $y = ax^2 + bx + c$
 a: 8.85207e-3
 b: 3.99283e-1
 c: 1.33505e-2
 x: Amount Ratio
 y: Area Ratio
 Calibration Level Weights:
 Level 3 : 1
 Level 4 : 0.5
 Level 5 : 0.2
 Level 6 : 0.1
 Level 7 : 0.04
 Level 8 : 0.02
 Level 9 : 0.013333

 =====

Batch Report: C:\HPCHEM\1\DATA\20SEP19I\20SEP19D.B

Batch Review Method:

C:\HPCHEM\1\METHODS\CLO4-DP3.M

['#' ==> Run has not been reprocessed with Batch Review Method

['*' ==> Run has been saved with batch file]

#*	Sample	Location	Inj	SampleType	Run	Perchlorate Area	Perchlorat RT	Perchlorate Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	5.39218e4	7.750	8.75982e-1
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	1.32825e5	7.797	2.37682
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	2.76271e5	7.770	4.77237
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	5.61298e5	7.785	9.75097
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	1.51820e6	7.741	25.01082
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	3.31156e6	7.775	50.40300
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	5.23914e6	7.736	74.79107
#*	ICAL Verf@10ug/L	Vial 80	1	Control	11	5.74879e5	7.756	10.11855

#*	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	2.14568e5	7.767	5.00000
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	2.04758e5	7.816	5.00000
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	2.13407e5	7.793	5.00000
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	2.09246e5	7.798	5.00000
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	2.07403e5	7.763	5.00000
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	2.02929e5	7.800	5.00000
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	1.97933e5	7.765	5.00000
#*	ICAL Verf@10ug/L	Vial 80	1	Control	11	2.06243e5	7.776	5.00000

#*	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	1.70436e4	7.778	8.24488e-1
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	4.20754e4	7.805	2.38090
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	9.24707e4	7.787	5.14166
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	1.68622e5	7.781	9.52209
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	4.63724e5	7.760	25.04916
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	9.95933e5	7.793	50.14223
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	1.58066e6	7.758	74.93659
#*	ICAL Verf@10ug/L	Vial 80	1	Control	11	1.71000e5	7.760	9.79043

*** End of Report ***

Sequence: C:\HPCHEM\1\SEQUENCE\CLO4\2019\SEP\20SEP19I.S

Sequence Table:

Method and Injection Info Part:

Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
====	=====	=====	=====	====	=====	=====	=====
1	Vial 71	CLO4@ 0.2ug/L	CLO4-AQN	1	Ctrl Samp		
2	Vial 72	CLO4@ 0.5ug/L	CLO4-AQN	1	Ctrl Samp		
3	Vial 73	CLO4@ 1.0ug/L	CLO4-AQN	1	Ctrl Samp		
4	Vial 74	CLO4@ 2.0ug/L	CLO4-AQN	1	Ctrl Samp		
5	Vial 75	CLO4@ 5.0ug/L	CLO4-AQN	1	Ctrl Samp		
6	Vial 76	CLO4@ 10.ug/L	CLO4-AQN	1	Ctrl Samp		
7	Vial 77	CLO4@ 25.ug/L	CLO4-AQN	1	Ctrl Samp		
8	Vial 78	CLO4@ 50.ug/L	CLO4-AQN	1	Ctrl Samp		
9	Vial 79	CLO4@ 75.ug/L	CLO4-AQN	1	Ctrl Samp		
10	Vial 71	CLO4@ 0.2ug/L	CLO4-AQN	1	Ctrl Samp		
11	Vial 80	ICAL Verf@10ug/L	CLO4-AQN	1	Ctrl Samp		

Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI03.D

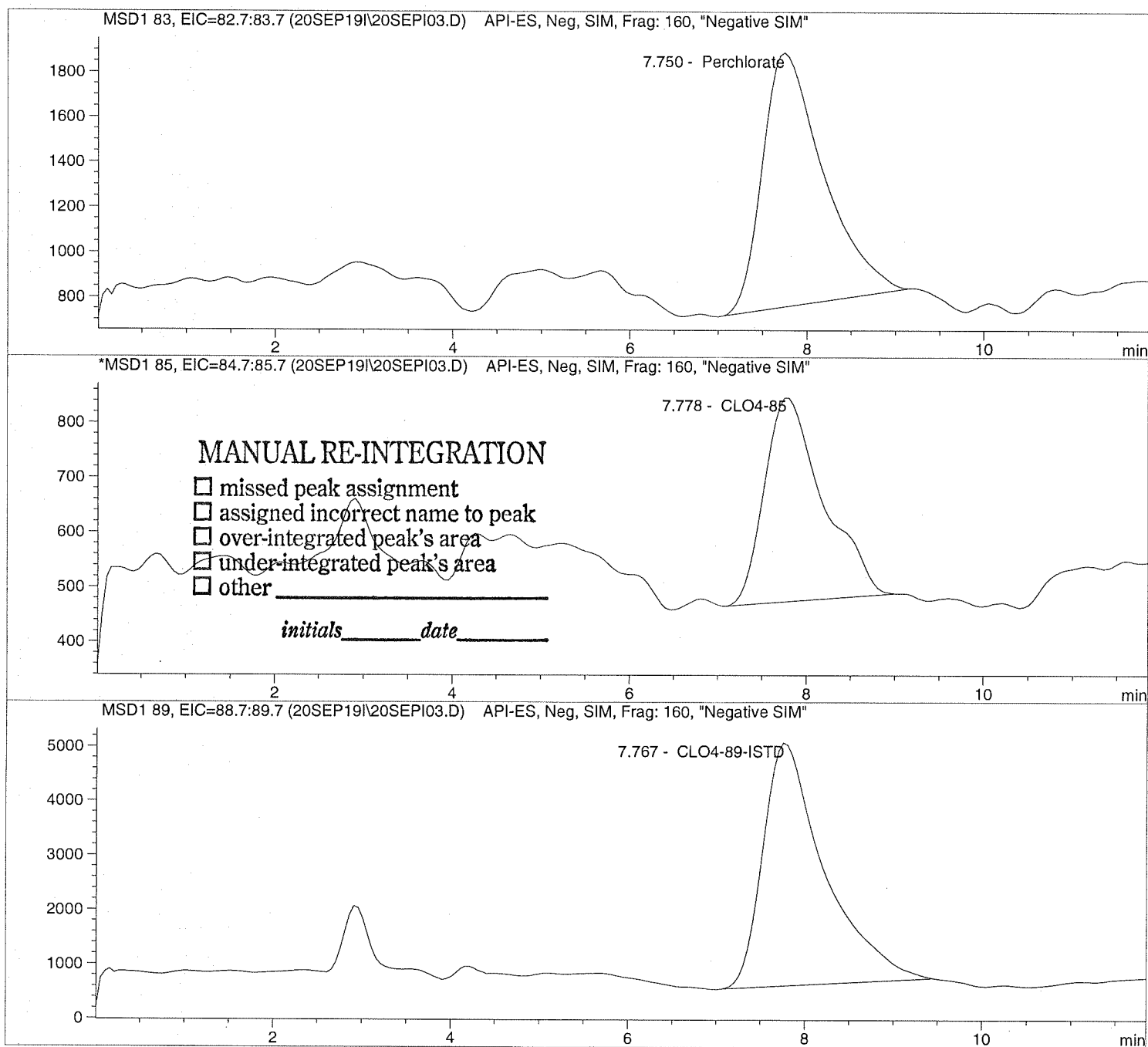
Sample Name: CLO4@ 1.0ug/L

Injection Date: 9/20/2019 09:24:05
 Sample Name: CLO4@ 1.0ug/L
 Acq Operator: TNB

Seq Line: 3
 Location: Vial 73
 Inj. No.: 1
 Inj. Vol.: 30 μ l

Acq. Method: CLO4-AQN.M
 Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
 Last Changed: 9/23/2019 12:21:47

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI03.D Sample Name: CLO4@ 1.0ug/L

```

=====
Injection Date: 9/20/2019 09:24:05      Seq Line:      3
Sample Name:    CLO4@ 1.0ug/L           Location:      Vial 73
Acq Operator:   TNB                     Inj. No.:     1
                                           Inj. Vol.:    30 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   9/23/2019 12:21:47
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  1.000
=====

```

```

=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.750	PBA	53921.8	0.8760	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.778	MM	17043.6	0.8245	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.767	PBA	214568.1	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\20SEP19\20SEPI04.D

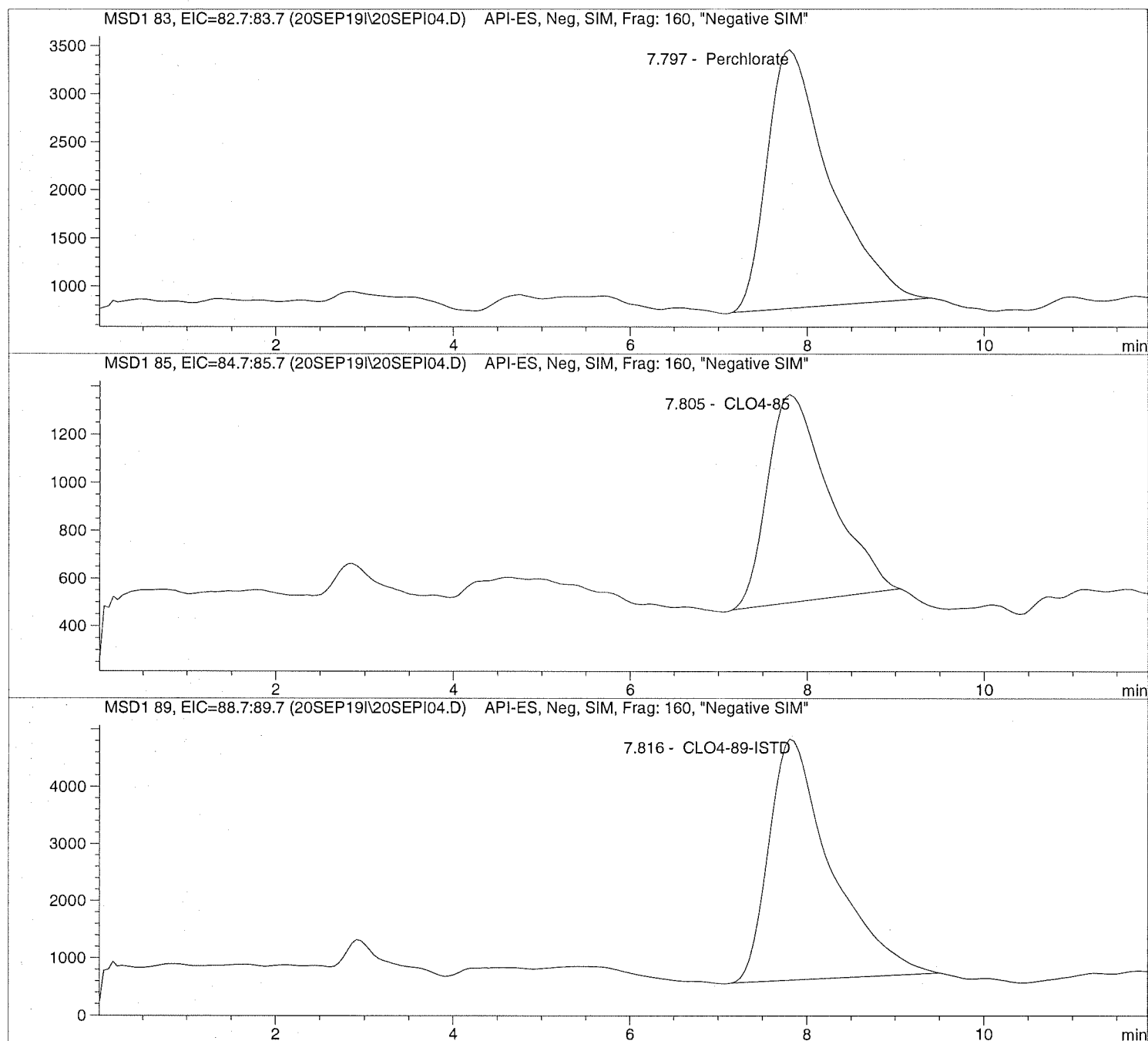
Sample Name: CLO4@ 2.0ug/L

Injection Date: 9/20/2019 09:37:58
Sample Name: CLO4@ 2.0ug/L
Acq Operator: TNB

Seq Line: 4
Location: Vial 74
Inj. No.: 1
Inj. Vol.: 30 μ l

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:21:47

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI04.D Sample Name: CLO4@ 2.0ug/L

```

=====
Injection Date: 9/20/2019 09:37:58      Seq Line: 4
Sample Name:    CLO4@ 2.0ug/L           Location:  Vial 74
Acq Operator:   TNB                     Inj. No.: 1
                                           Inj. Vol.: 30 µl
  
```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   9/23/2019 12:21:47
  
```

Perchlorate analysis

Sample Information

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  2.000
  
```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.797	PBA	132825.2	2.3768	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.805	PBA	42075.4	2.3809	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.816	PBA	204758.3	5.0000	CLO4-89-ISTD

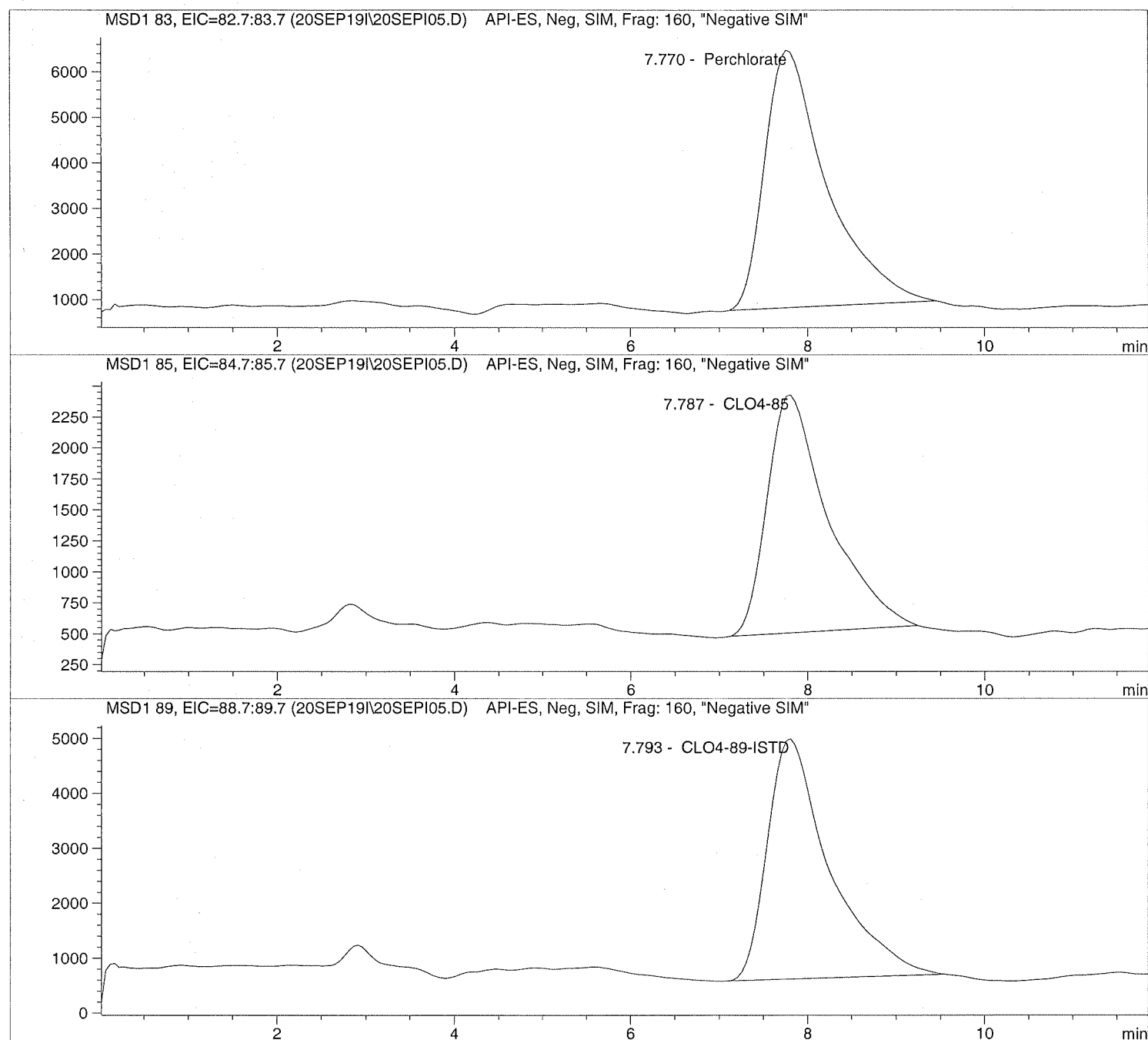
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI05.D Sample Name: CLO4@ 5.0ug/L

```
=====
Injection Date: 9/20/2019 09:51:49      Seq Line:      5
Sample Name:    CLO4@ 5.0ug/L           Location:      Vial 75
Acq Operator:   TNB                     Inj. No.:     1
                                           Inj. Vol.:    30 µl
=====
```

```
Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   9/23/2019 12:21:47
=====
```

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI05.D Sample Name: CLO4@ 5.0ug/L

```

=====
Injection Date:  9/20/2019  09:51:49          Seq Line:           5
Sample Name:    CLO4@ 5.0ug/L              Location:           Vial 75
Acq Operator:   TNB                          Inj. No.:          1
                                           Inj. Vol.:         30 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   9/23/2019  12:21:47
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified:  Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  5.000
=====

```

```

=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.770	PBA	276270.7	4.7724	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.787	PBA	92470.7	5.1417	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.793	PBA	213407.0	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI06.D

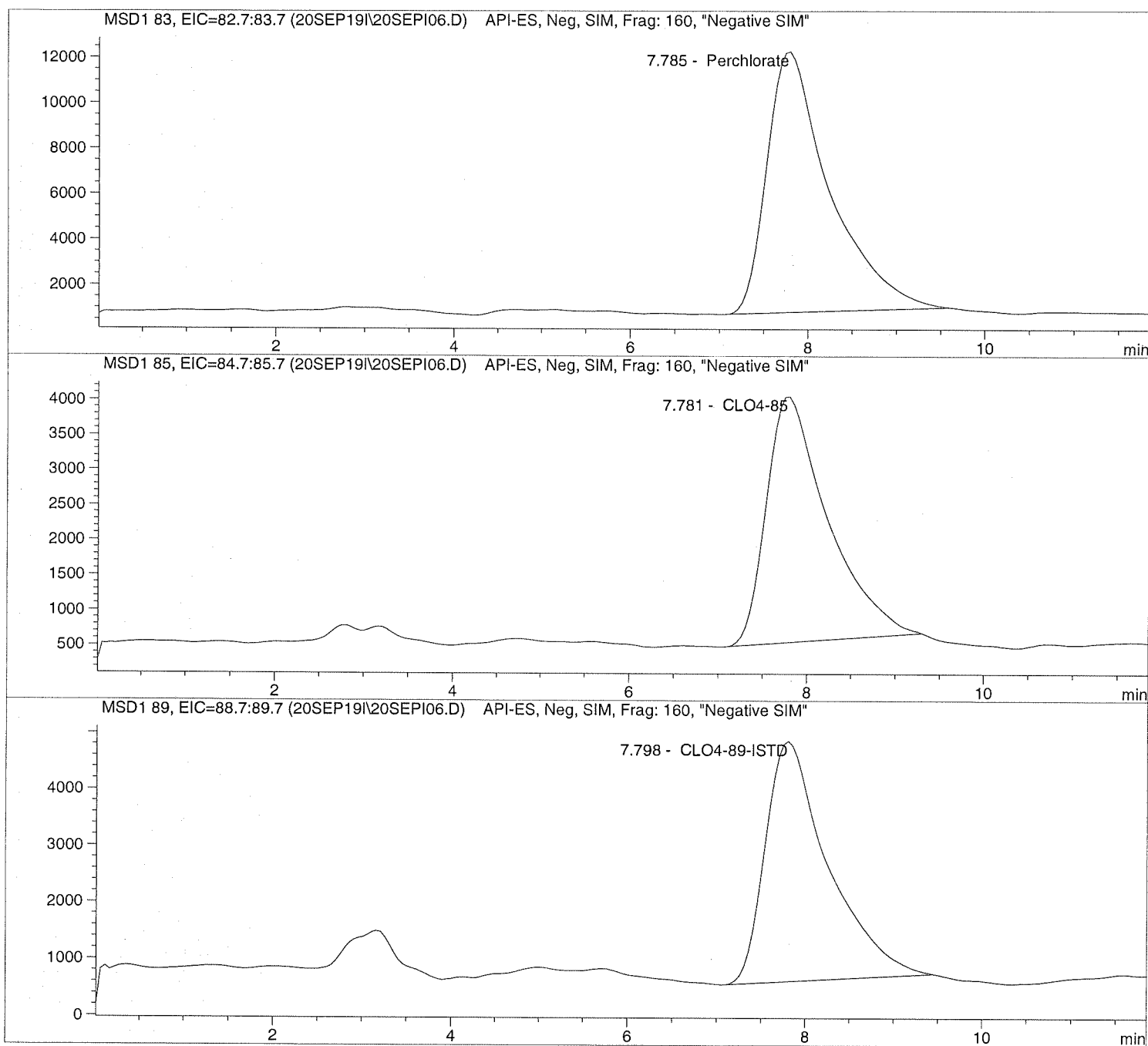
Sample Name: CLO4@ 10.ug/L

Injection Date: 9/20/2019 10:05:36
Sample Name: CLO4@ 10.ug/L
Acq Operator: TNB

Seq Line: 6
Location: Vial 76
Inj. No.: 1
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:21:47

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI06.D Sample Name: CLO4@ 10.ug/L

```

=====
Injection Date: 9/20/2019 10:05:36      Seq Line: 6
Sample Name:    CLO4@ 10.ug/L           Location:  Vial 76
Acq Operator:   TNB                     Inj. No.: 1
                                           Inj. Vol.: 30 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   9/23/2019 12:21:47
=====

```

Perchlorate analysis

Sample Information

```

=====
Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:    1.000000
Dilution:      1.000000
Sample Amount: 10.000
=====

```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.785	PBA	561297.7	9.7510	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.781	PBA	168622.4	9.5221	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.798	PBA	209246.3	5.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI07.D

Sample Name: CLO4@ 25.ug/L

Injection Date: 9/20/2019 10:19:23

Seq Line: 7

Sample Name: CLO4@ 25.ug/L

Location: Vial 77

Acq Operator: TNB

Inj. No.: 1

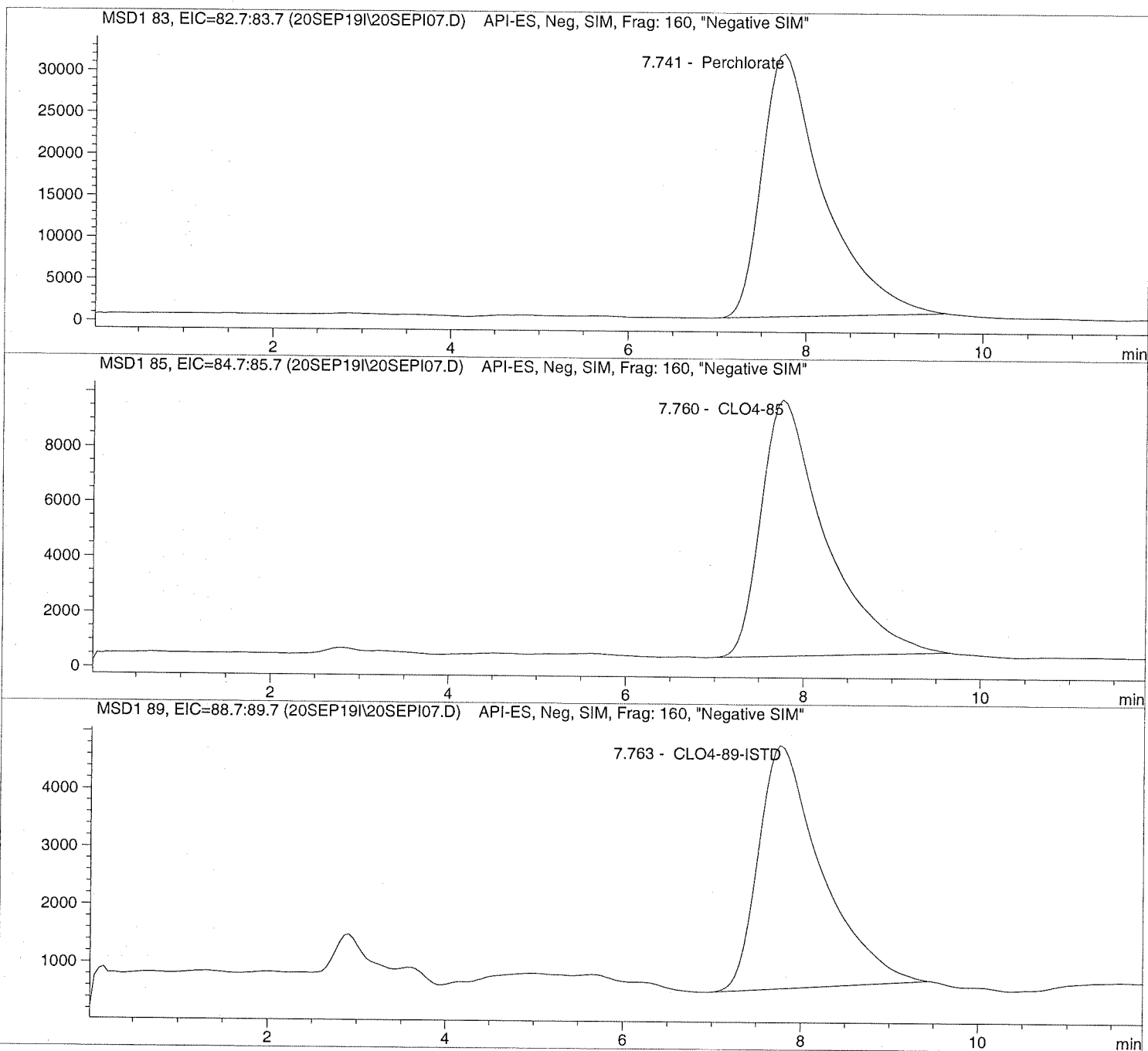
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M

Last Changed: 9/23/2019 12:21:47

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI07.D Sample Name: CLO4@ 25.ug/L

```

=====
Injection Date: 9/20/2019 10:19:23      Seq Line: 7
Sample Name:    CLO4@ 25.ug/L           Location:  Vial 77
Acq Operator:   TNB                     Inj. No.: 1
                                           Inj. Vol.: 30 µl
  
```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   9/23/2019 12:21:47
  
```

Perchlorate analysis

Sample Information

```

=====
Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  25.000
  
```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.741	PBA	1518197.9	25.0108	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.760	PBA	463724.0	25.0492	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.763	PBA	207402.8	5.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI08.D

Sample Name: CLO4@ 50.ug/L

Injection Date: 9/20/2019 10:33:18

Seq Line: 8

Sample Name: CLO4@ 50.ug/L

Location: Vial 78

Acq Operator: TNB

Inj. No.: 1

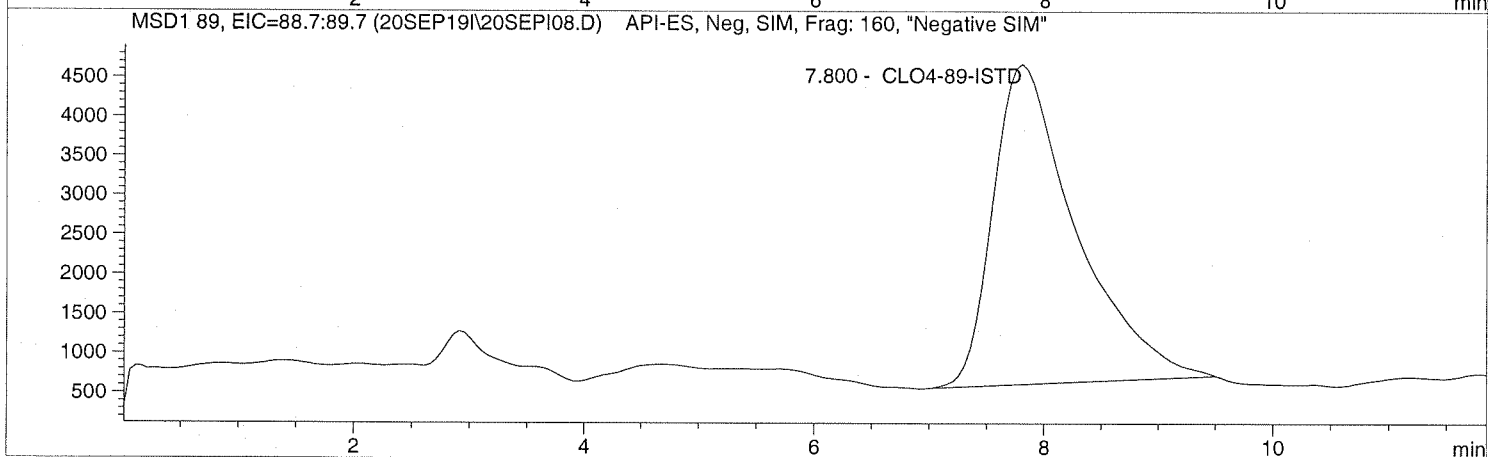
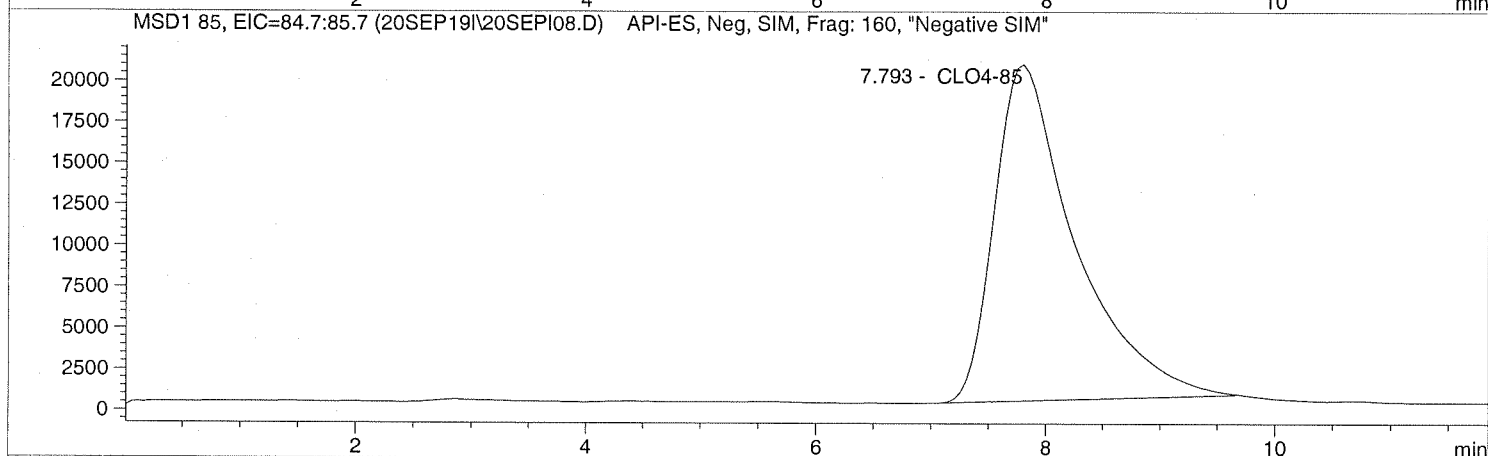
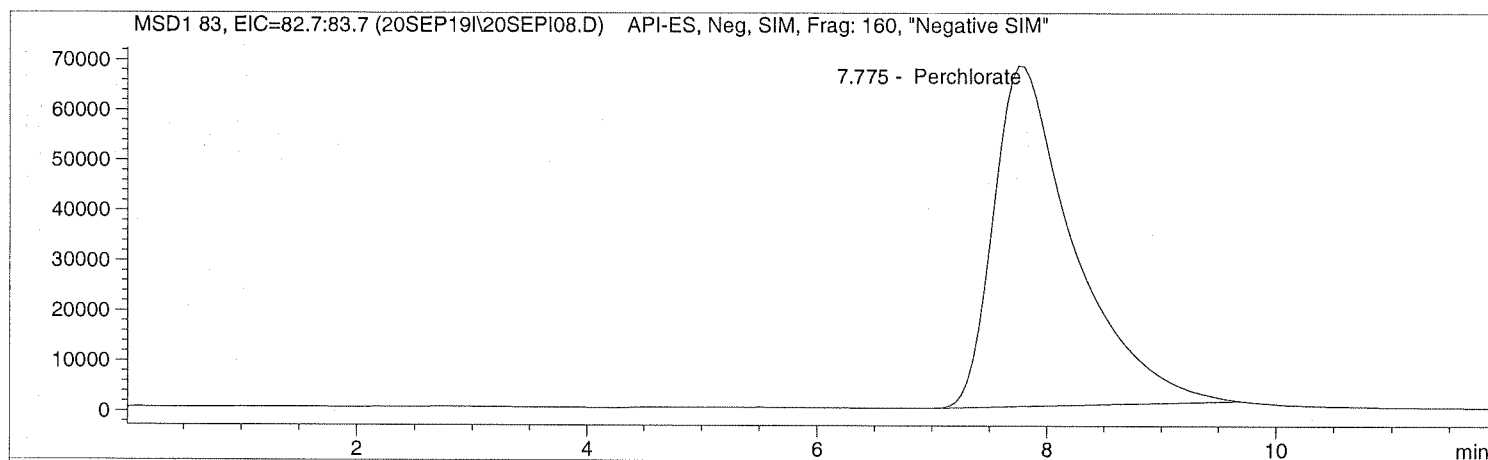
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M

Last Changed: 9/23/2019 12:21:47

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI08.D Sample Name: CLO4@ 50.ug/L

```

=====
Injection Date: 9/20/2019 10:33:18      Seq Line:      8
Sample Name:   CLO4@ 50.ug/L           Location:     Vial 78
Acq Operator:  TNB                     Inj. No.:    1
                                           Inj. Vol.:   30 µl
=====

```

```

Acq. Method:   CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:  9/23/2019 12:21:47
=====

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:    1.000000
Dilution:      1.000000
Sample Amount: 50.000
=====

```

```

=====
                          LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.775	PBA	3311559.2	50.4030	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.793	PBA	995933.0	50.1422	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.800	PBA	202929.2	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI09.D

Sample Name: CLO4@ 75.ug/L

Injection Date: 9/20/2019 10:47:05

Seq Line: 9

Sample Name: CLO4@ 75.ug/L

Location: Vial 79

Acq Operator: TNB

Inj. No.: 1

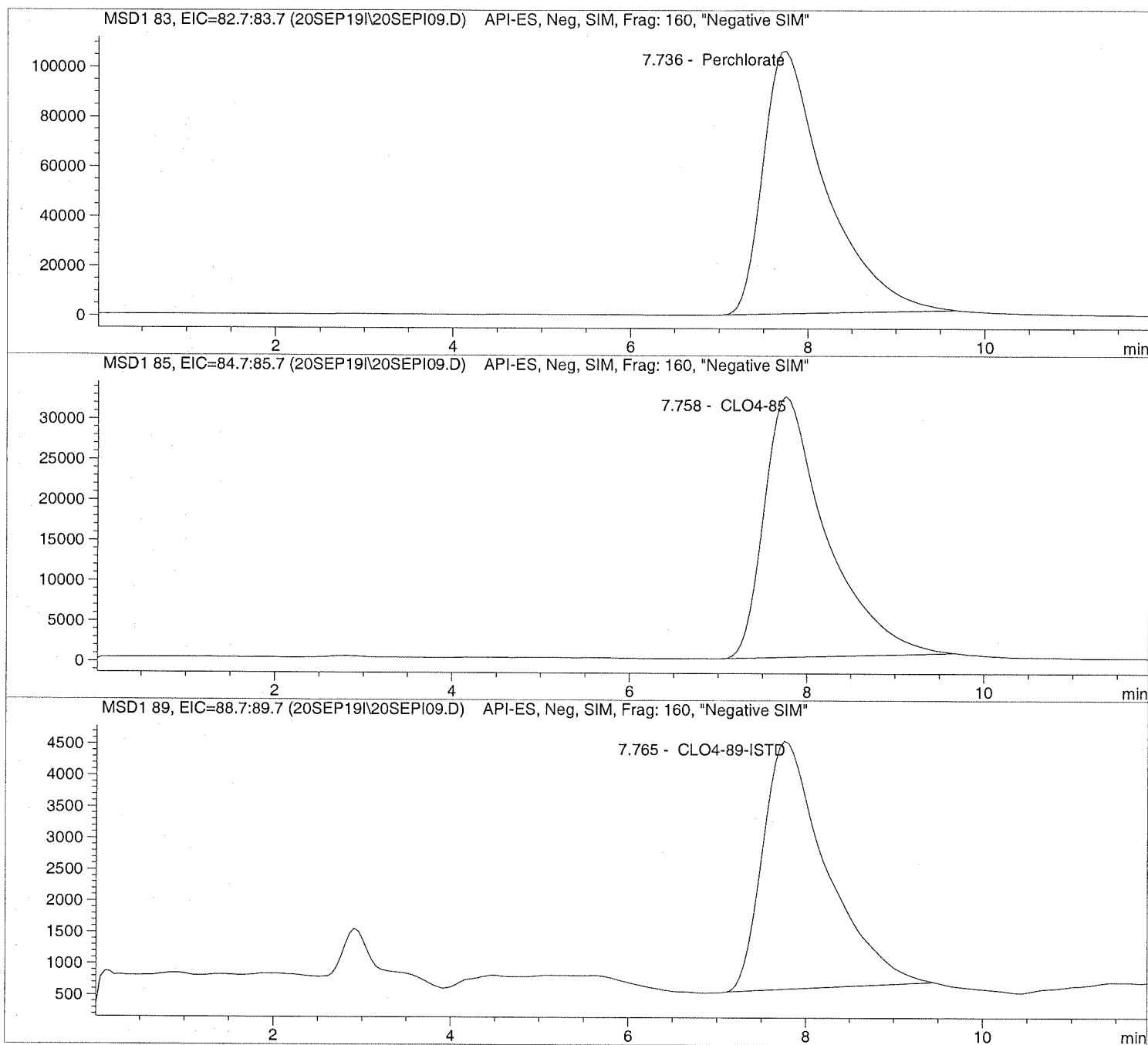
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M

Last Changed: 9/23/2019 12:21:47

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI09.D

Sample Name: CLO4@ 75.ug/L

```

=====
Injection Date: 9/20/2019 10:47:05      Seq Line:          9
Sample Name:    CLO4@ 75.ug/L           Location:          Vial 79
Acq Operator:   TNB                     Inj. No.:         1
                                           Inj. Vol.:        30 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   9/23/2019 12:21:47
=====

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  75.000
=====

```

```

=====
                          LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.736	PBA	5239145.0	74.7911	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.758	PBA	1580664.2	74.9366	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.765	PBA	197932.5	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI11.D

Sample Name: ICAL Verf@10ug/L

Injection Date: 9/20/2019 11:14:45

Seq Line: 11

Sample Name: ICAL Verf@10ug/L

Location: Vial 80

Acq Operator: TNB

Inj. No.: 1

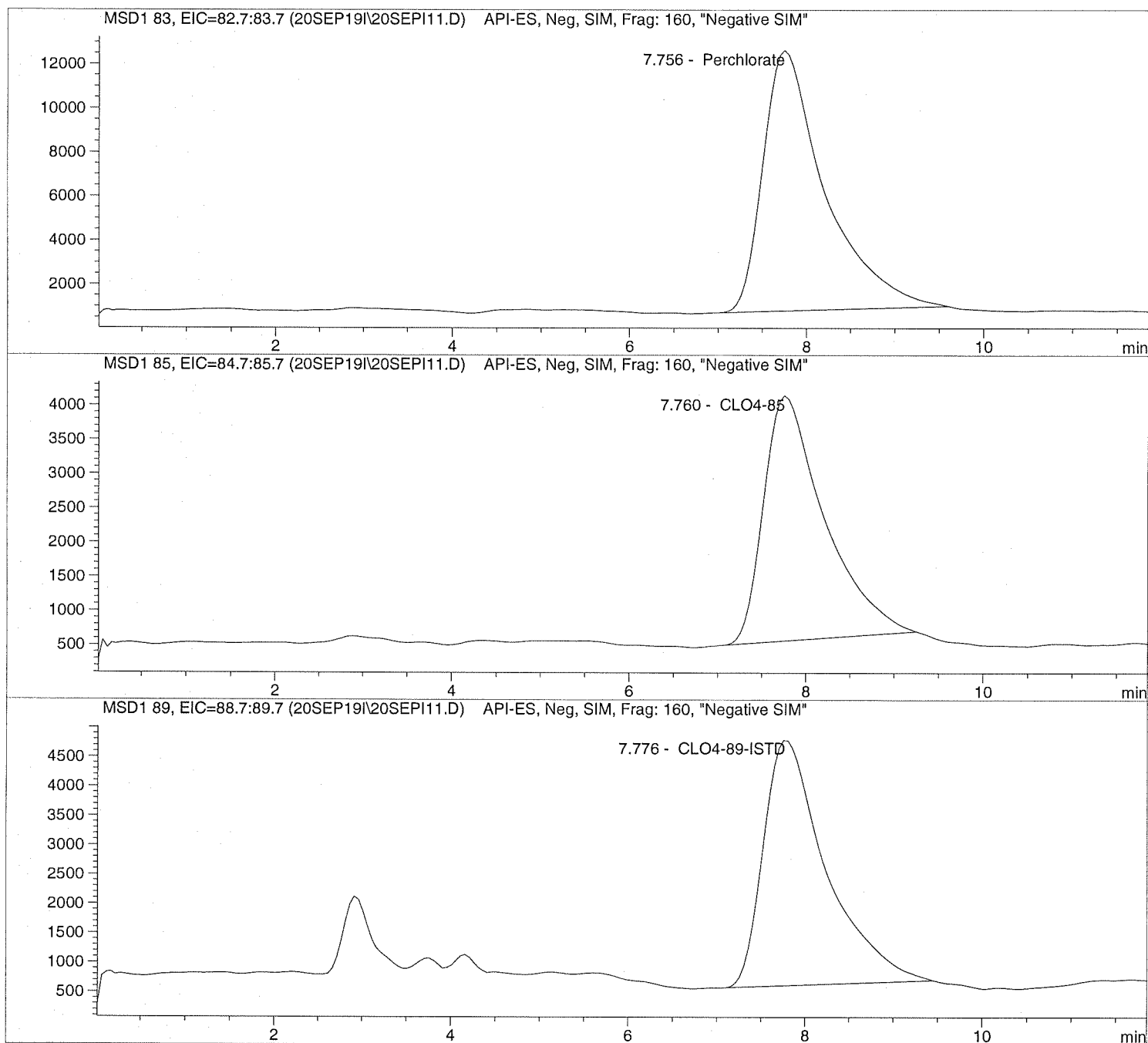
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M

Last Changed: 9/23/2019 12:21:47

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI11.D Sample Name: ICAL Verf@10ug/L

```

=====
Injection Date: 9/20/2019 11:14:45      Seq Line:      11
Sample Name:    ICAL Verf@10ug/L        Location:      Vial 80
Acq Operator:   TNB                      Inj. No.:     1
                                           Inj. Vol.:    30 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   9/23/2019 12:21:47
=====

```

Perchlorate analysis

Sample Information

```

=====
Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  10.000
=====

```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.756	PBA	574879.4	10.1185	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.760	PBA	171000.4	9.7904	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.776	PBA	206243.3	5.0000	CLO4-89-ISTD

*** End of Report ***



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Unmodified

Data file: C:\HPCHEM\1\DATA\20SEP19\20SEPI03.D

Sample Name: CLO4@ 1.0ug/L

Injection Date: 9/20/2019 09:24:05

Seq Line: 3

Sample Name: CLO4@ 1.0ug/L

Location: Vial 73

Acq Operator: TNB

Inj. No.: 1

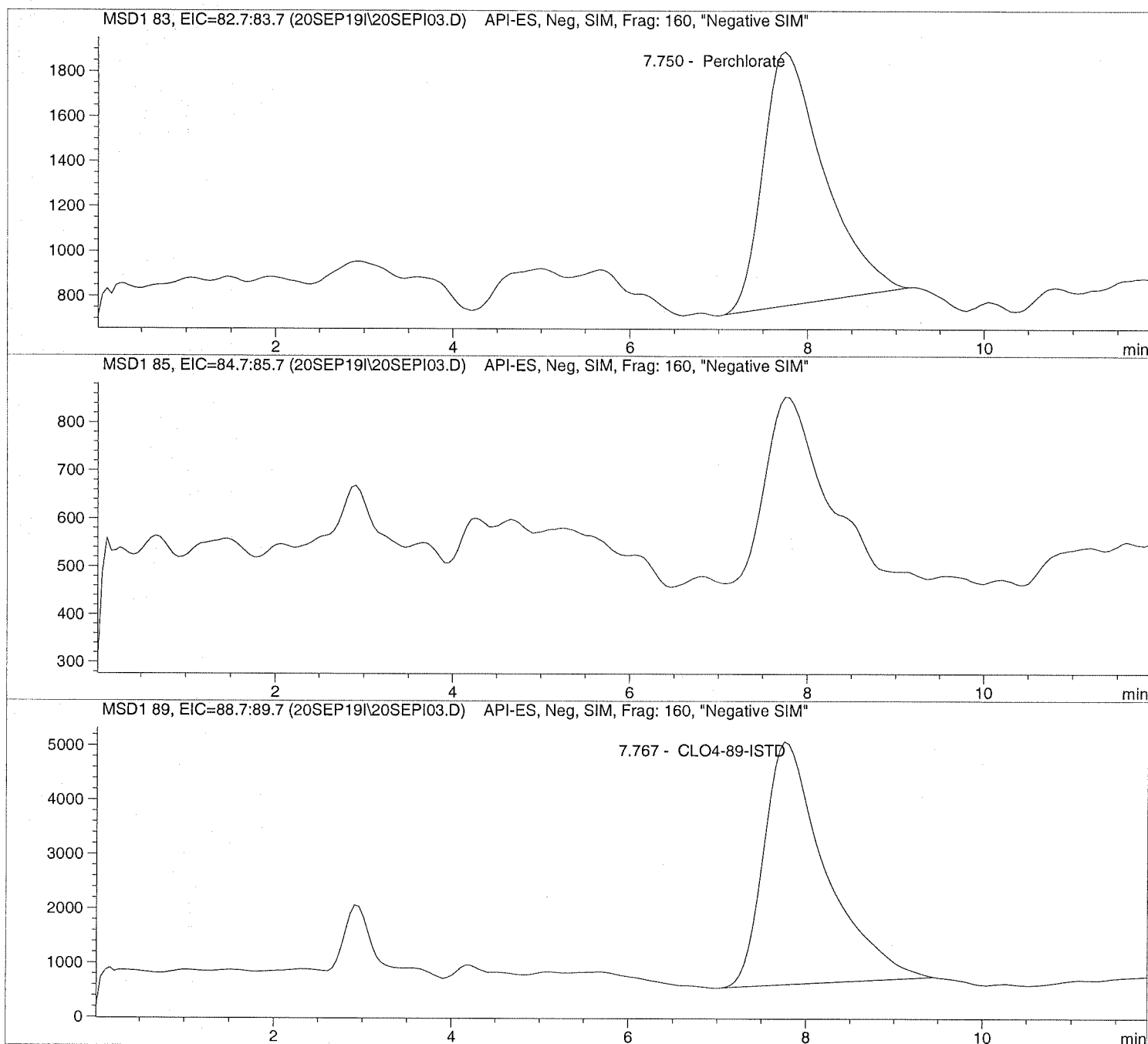
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M

Last Changed: 9/23/2019 12:27:11

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI03.D Sample Name: CLO4@ 1.0ug/L

```

=====
Injection Date: 9/20/2019 09:24:05      Seq Line:          3
Sample Name:    CLO4@ 1.0ug/L           Location:          Vial 73
Acq Operator:   TNB                     Inj. No.:         1
                                           Inj. Vol.:        30 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   9/23/2019 12:27:11
=====

```

Perchlorate analysis

Sample Information

```

=====
Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  1.000
=====

```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.750	PBA	53921.8	0.8760	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.767	PBA	214568.1	5.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\20DEC19D\20DECD14.D

Sample Name: 1935316001

Injection Date: 12/20/2019 16:20:57

Seq Line: 14

Sample Name: 1935316001

Location: Vial 84

Acq Operator: TNB

Inj. No.: 1

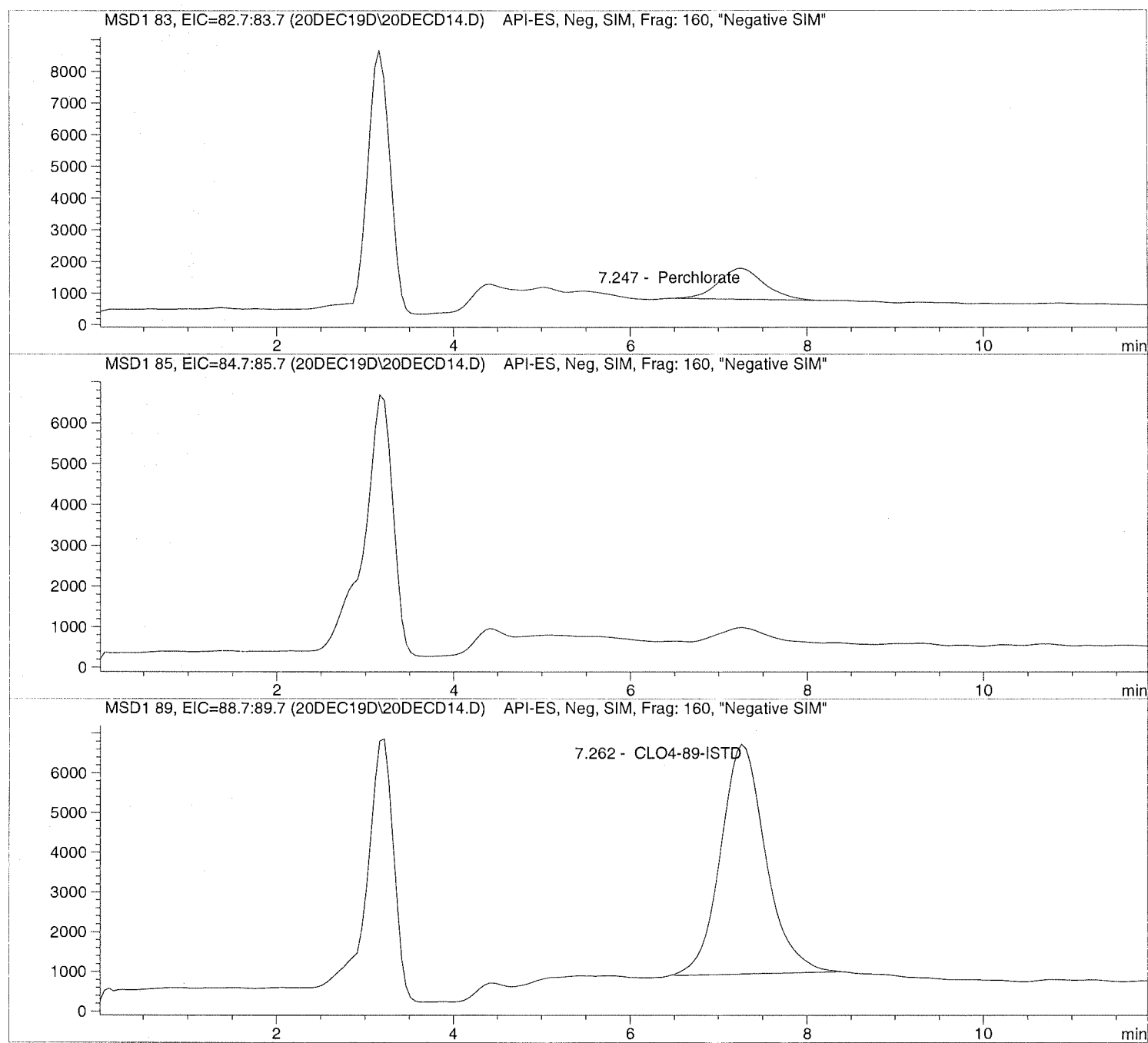
Inj. Vol.: 35 μ l

Acq. Method: CLO4-AQN.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M

Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20DEC19D\20DECD14.D Sample Name: 1935316001

```

=====
Injection Date: 12/20/2019 16:20:57      Seq Line:          14
Sample Name:   1935316001                Location:          Vial 84
Acq Operator:  TNB                       Inj. No.:         1
                                           Inj. Vol.:        35 µl
=====

```

```

Acq. Method:   CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:  11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:          Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:         1.000000
Dilution:           1.000000
Sample Amount:      0.000
=====

```

```

=====
                          LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.247	PBA	35246.8	0.5749	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.262	BBA	204617.7	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\20DEC19D\20DEC16.D

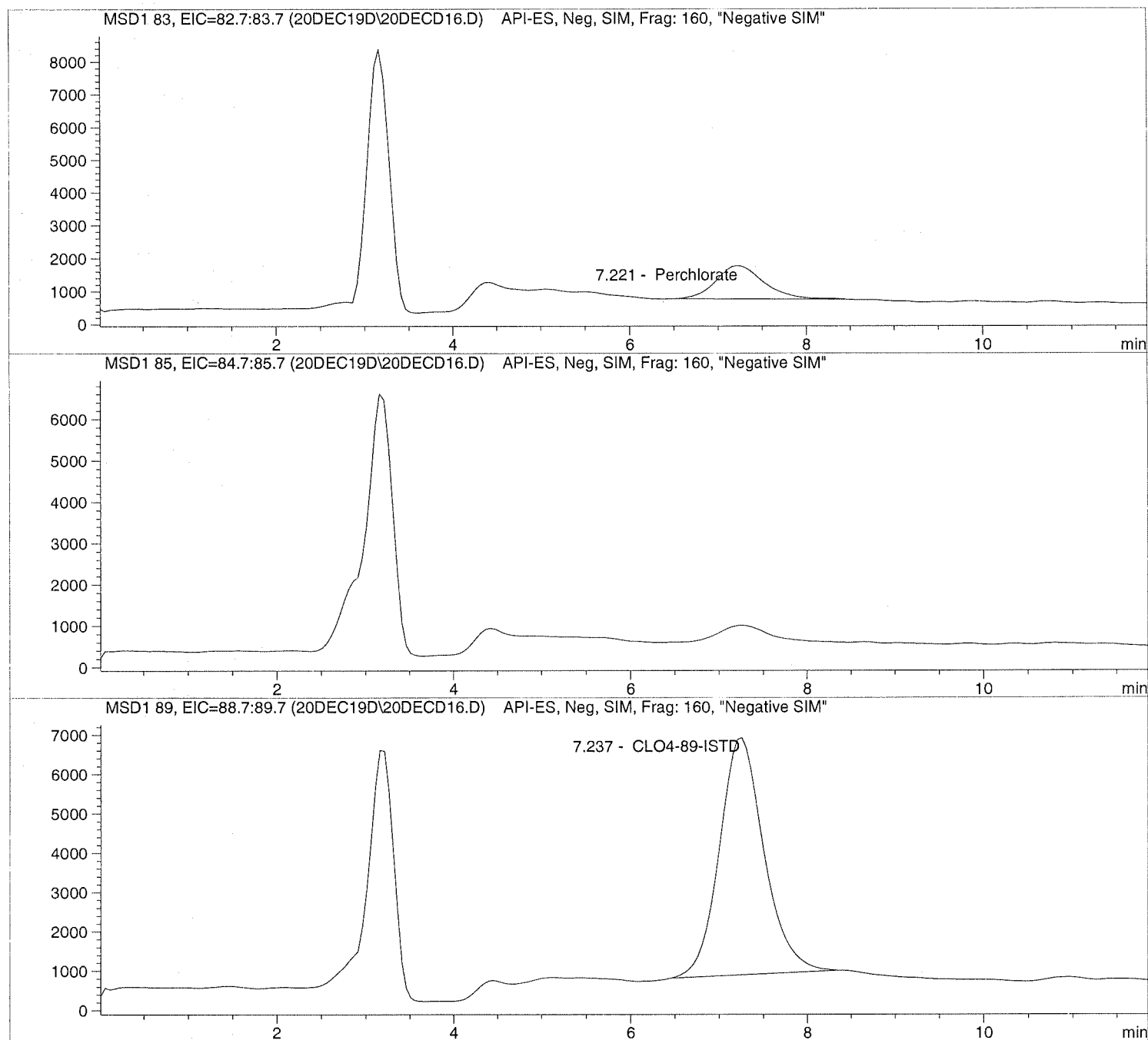
Sample Name: 1935316002

Injection Date: 12/20/2019 16:48:43
Sample Name: 1935316002
Acq Operator: TNB

Seq Line: 16
Location: Vial 85
Inj. No.: 1
Inj. Vol.: 35 μ l

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20DEC19D\20DEC16.D Sample Name: 1935316002

```

=====
Injection Date: 12/20/2019 16:48:43      Seq Line:          16
Sample Name:    1935316002                Location:          Vial 85
Acq Operator:   TNB                       Inj. No.:         1
                                           Inj. Vol.:        35 µl

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   11/5/2019 08:44:45

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  0.000

```

```

=====
                          LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.221	PBA	37711.6	0.6019	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.237	PBA	210291.4	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***

```

Data file: C:\HPCHEM\1\DATA\20DEC19D\20DECD18.D

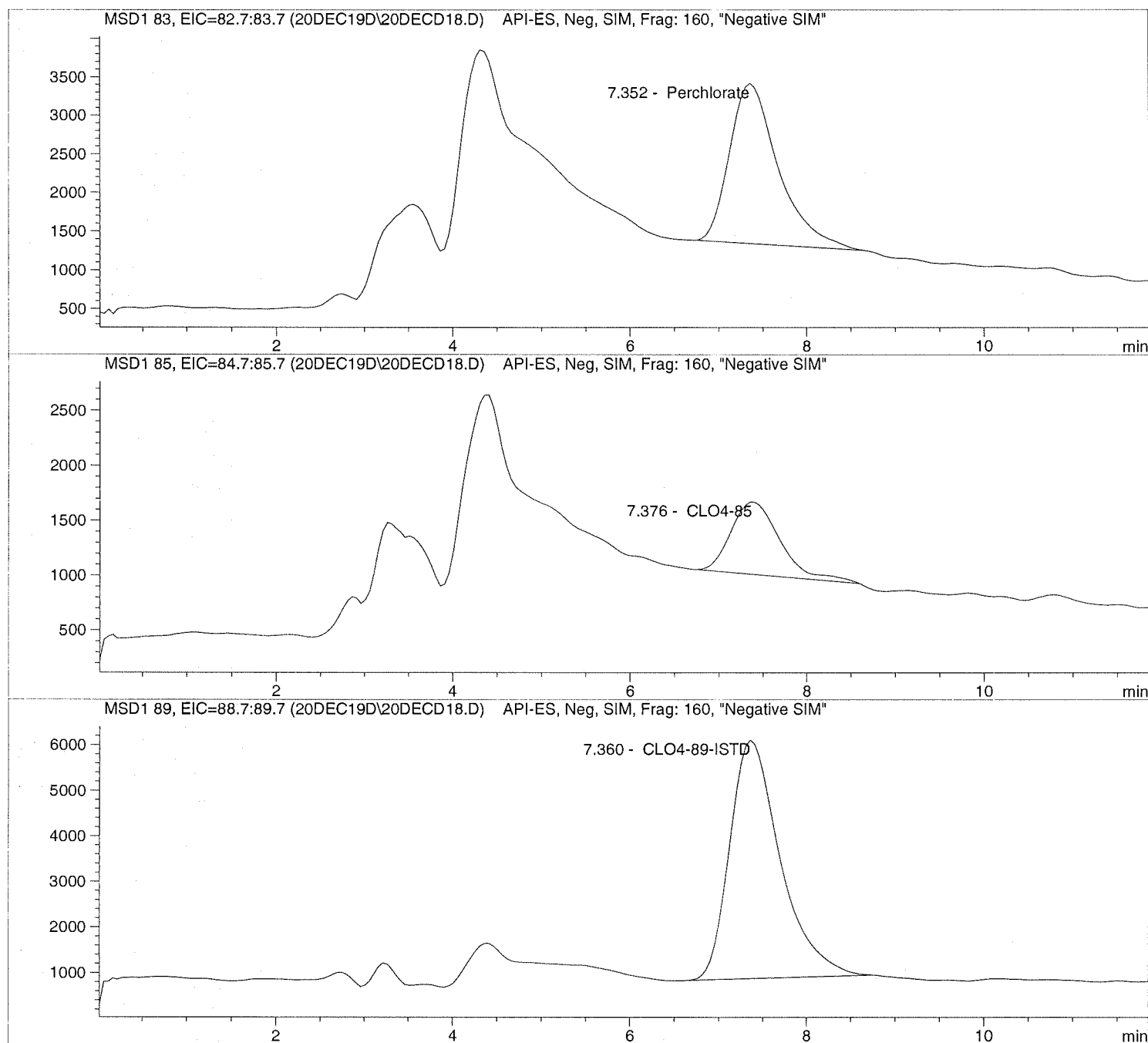
Sample Name: 1935316004

=====
Injection Date: 12/20/2019 17:16:32
Sample Name: 1935316004
Acq Operator: TNB

Seq Line: 18
Location: Vial 87
Inj. No.: 1
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20DEC19D\20DEC18.D

Sample Name: 1935316004

```

=====
Injection Date: 12/20/2019 17:16:32      Seq Line: 18
Sample Name: 1935316004                  Location: Vial 87
Acq Operator: TNB                        Inj. No.: 1
                                           Inj. Vol.: 35 µl
=====

```

```

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By: Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 0.000
=====

```

```

=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.352	PBA	79516.8	1.3684	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.376	PBA	25544.4	1.3576	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.360	PBA	208671.3	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\20DEC19D\20DECD19.D

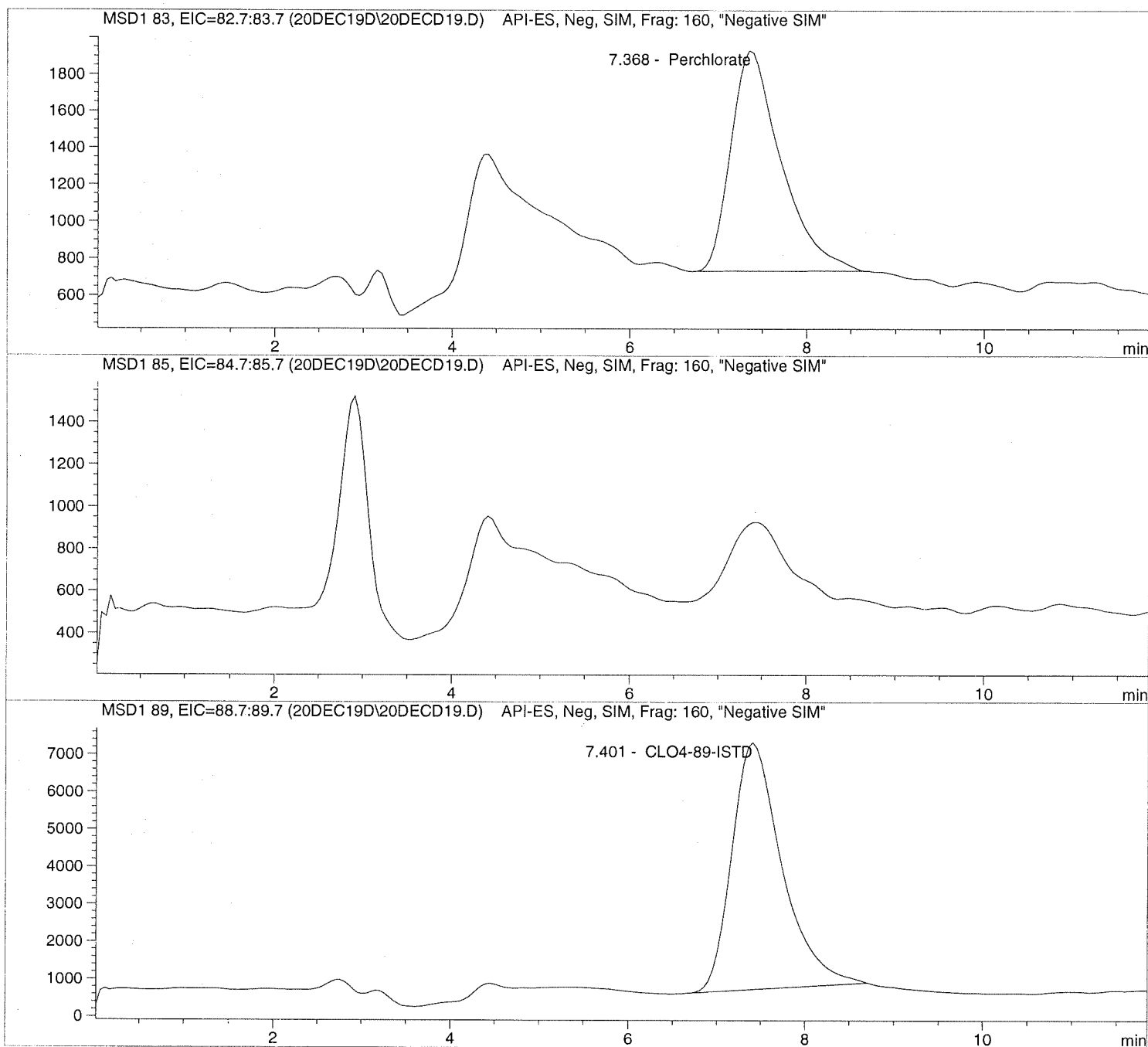
Sample Name: 1935343001

Injection Date: 12/20/2019 17:30:23
Sample Name: 1935343001
Acq Operator: TNB

Seq Line: 19
Location: Vial 88
Inj. No.: 1
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20DEC19D\20DECD19.D

Sample Name: 1935343001

```

=====
Injection Date: 12/20/2019 17:30:23      Seq Line:      19
Sample Name:   1935343001                Location:      Vial 88
Acq Operator:  TNB                       Inj. No.:     1
                                           Inj. Vol.:    35 µl
=====

```

```

Acq. Method:   CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:  11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:    1.000000
Dilution:      1.000000
Sample Amount: 0.000
=====

```

```

=====
                          LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.368	PBA	47484.7	0.6123	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.401	PBA	260797.0	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```




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

January 06, 2020

Marcia Olive
Bhate Environmental Associates, Inc.
445 Union Blvd Ste 129
Lakewood, CO 80228

Work Order: **HS19121036**

Laboratory Results for: **LHAAP Site 18/24**

Dear Marcia,

ALS Environmental received 9 sample(s) on Dec 18, 2019 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,

A handwritten signature in black ink, appearing to read "Raj. P. Modashia", enclosed in a circular scribble.

Generated By: DAYNA.FISHER

RJ Modashia
Project Manager

ALS Houston, US

Date: 06-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: LHAAP Site 18/24
Work Order: HS19121036

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19121036-01	C09_121719	Groundwater		17-Dec-2019 08:00	18-Dec-2019 10:50	<input type="checkbox"/>
HS19121036-02	126_121719	Groundwater		17-Dec-2019 09:00	18-Dec-2019 10:50	<input type="checkbox"/>
HS19121036-03	126_121719_a	Groundwater		17-Dec-2019 09:00	18-Dec-2019 10:50	<input type="checkbox"/>
HS19121036-04	MW18_121719	Groundwater		17-Dec-2019 10:00	18-Dec-2019 10:50	<input type="checkbox"/>
HS19121036-05	120_121719	Groundwater		17-Dec-2019 10:55	18-Dec-2019 10:50	<input type="checkbox"/>
HS19121036-06	MW14_121719	Groundwater		17-Dec-2019 11:40	18-Dec-2019 10:50	<input type="checkbox"/>
HS19121036-07	18CPTMW04SW_121719	Groundwater		17-Dec-2019 12:35	18-Dec-2019 10:50	<input type="checkbox"/>
HS19121036-08	18CPTMW04_121719	Groundwater		17-Dec-2019 13:25	18-Dec-2019 10:50	<input type="checkbox"/>
HS19121036-09	Trip Blank	Water		17-Dec-2019 00:00	18-Dec-2019 10:50	<input type="checkbox"/>

ALS Houston, US

Date: 06-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: LHAAP Site 18/24
Work Order: HS19121036

CASE NARRATIVE

Work Order Comments

- The analysis for Perchlorate was subcontracted to ALS Salt Lake City, UT. Final report attached.

GCMS Semivolatiles by Method SW8270SIM**Batch ID: 149052****Sample ID: MW14_121719 (HS19121036-06)**

- The surrogate recoveries could not be determined due to dilution below the calibration range.

GCMS Volatiles by Method SW8260**Batch ID: R352981****Sample ID: CCV**

- 1,2,3-Trichlorobenzene exceeded %D limits for CCV. Samples are ND for this compound.

Sample ID: VLCSW-191219

- 1,2,3-Trichlorobenzene and 1,2,4-Trichlorobenzene exceeded QC limits fro LCS.

Sample ID: MW18_121719 (HS19121036-04MS), C09_121719 (HS19121036-01MS)

- MS and/or MSD recovered outside control limits

Metals by Method SW7470**Batch ID: 149282**

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

Metals by Method SW6020**Batch ID: 149161****Sample ID: C09_121719 (HS19121036-01MSD)**

- Silver failed for MSD but passed for LCS,MS and PDS.
 - The MS and/or MSD recovery was outside of the control; however, the result in the parent sample is greater than 4x the spike amount.
Barium, Calcium, Magnesium and Sodium
-

ALS Houston, US

Date: 06-Jan-20

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP Site 18/24
 Sample ID: C09_121719
 Collection Date: 17-Dec-2019 08:00

ANALYTICAL REPORT

WorkOrder:HS19121036
 Lab ID:HS19121036-01
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD		Method:SW8260						
8260C								Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 14:08
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 14:08
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	19-Dec-2019 14:08
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 14:08
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 14:08
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 14:08
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 14:08
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	19-Dec-2019 14:08
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	19-Dec-2019 14:08
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	19-Dec-2019 14:08
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 14:08
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 14:08
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 14:08
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	19-Dec-2019 14:08
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 14:08
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	19-Dec-2019 14:08
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 14:08
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	19-Dec-2019 14:08
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 14:08
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	19-Dec-2019 14:08
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 14:08
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	19-Dec-2019 14:08
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 14:08
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	19-Dec-2019 14:08
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	19-Dec-2019 14:08
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 14:08
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	19-Dec-2019 14:08
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	19-Dec-2019 14:08
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 14:08
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	19-Dec-2019 14:08
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 14:08
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 14:08
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	19-Dec-2019 14:08
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	19-Dec-2019 14:08
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	19-Dec-2019 14:08
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	19-Dec-2019 14:08
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 14:08
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 14:08
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 14:08

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

ALS Houston, US

Date: 06-Jan-20

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP Site 18/24
 Sample ID: C09_121719
 Collection Date: 17-Dec-2019 08:00

ANALYTICAL REPORT

WorkOrder:HS19121036
 Lab ID:HS19121036-01
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD		Method:SW8260						
8260C								Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 14:08
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 14:08
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	19-Dec-2019 14:08
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 14:08
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 14:08
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 14:08
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 14:08
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	UG/L	1	19-Dec-2019 14:08
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 14:08
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	19-Dec-2019 14:08
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	19-Dec-2019 14:08
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	19-Dec-2019 14:08
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 14:08
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 14:08
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 14:08
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 14:08
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 14:08
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 14:08
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 14:08
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 14:08
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 14:08
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 14:08
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 14:08
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 14:08
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 14:08
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>91.9</i>			0	<i>81-118</i>	<i>%REC</i>	<i>1</i>	<i>19-Dec-2019 14:08</i>
<i>Surr: 4-Bromofluorobenzene</i>	<i>99.4</i>			0	<i>85-114</i>	<i>%REC</i>	<i>1</i>	<i>19-Dec-2019 14:08</i>
<i>Surr: Dibromofluoromethane</i>	<i>92.8</i>			0	<i>80-119</i>	<i>%REC</i>	<i>1</i>	<i>19-Dec-2019 14:08</i>
<i>Surr: Toluene-d8</i>	<i>102</i>			0	<i>89-112</i>	<i>%REC</i>	<i>1</i>	<i>19-Dec-2019 14:08</i>

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

ALS Houston, US

Date: 06-Jan-20

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP Site 18/24
 Sample ID: C09_121719
 Collection Date: 17-Dec-2019 08:00

ANALYTICAL REPORT

WorkOrder:HS19121036
 Lab ID:HS19121036-01
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A		Method:SW6020				Prep:SW3010A / 27-Dec-2019		Analyst: JHD
Aluminum	0.149		0.00180	0.00500	0.0100	mg/L	1	03-Jan-2020 12:10
Antimony	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	03-Jan-2020 12:10
Arsenic	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	03-Jan-2020 12:10
Barium	0.948		0.00190	0.00250	0.00500	mg/L	1	03-Jan-2020 12:10
Beryllium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	03-Jan-2020 12:10
Cadmium	0.000207	J	0.000200	0.000500	0.00200	mg/L	1	03-Jan-2020 12:10
Calcium	236		0.680	1.00	10.0	mg/L	20	03-Jan-2020 14:34
Chromium	0.00256	J	0.000400	0.000500	0.00500	mg/L	1	03-Jan-2020 12:10
Cobalt	0.00104	J	0.000100	0.000500	0.00500	mg/L	1	03-Jan-2020 12:10
Copper	0.00250	U	0.00100	0.00250	0.00500	mg/L	1	03-Jan-2020 12:10
Iron	0.159	J	0.0120	0.0500	0.200	mg/L	1	03-Jan-2020 12:10
Lead	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	03-Jan-2020 12:10
Magnesium	79.1		0.0100	0.0500	0.200	mg/L	1	03-Jan-2020 12:10
Manganese	0.169		0.000700	0.00250	0.00500	mg/L	1	03-Jan-2020 12:10
Nickel	0.0250		0.000600	0.00100	0.00500	mg/L	1	03-Jan-2020 12:10
Potassium	0.977		0.0180	0.0500	0.200	mg/L	1	03-Jan-2020 12:10
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	03-Jan-2020 12:10
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	03-Jan-2020 12:10
Sodium	256		0.280	1.00	4.00	mg/L	20	03-Jan-2020 14:34
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	03-Jan-2020 12:10
Vanadium	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	03-Jan-2020 12:10
Zinc	0.00734		0.00200	0.00250	0.00500	mg/L	1	03-Jan-2020 12:10
MERCURY BY SW7470A		Method:SW7470				Prep:SW7470 / 31-Dec-2019		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	31-Dec-2019 16:42
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		Method:NA						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	06-Jan-2020 14:07

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

ALS Houston, US

Date: 06-Jan-20

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP Site 18/24
 Sample ID: 126_121719
 Collection Date: 17-Dec-2019 09:00

ANALYTICAL REPORT

WorkOrder:HS19121036
 Lab ID:HS19121036-02
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED	
VOLATILES ORGANICS BY METHOD		Method:SW8260							Analyst: PC
8260C									
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 14:32	
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 14:32	
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	19-Dec-2019 14:32	
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 14:32	
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 14:32	
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 14:32	
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 14:32	
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	19-Dec-2019 14:32	
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	19-Dec-2019 14:32	
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	19-Dec-2019 14:32	
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 14:32	
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 14:32	
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 14:32	
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	19-Dec-2019 14:32	
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 14:32	
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	19-Dec-2019 14:32	
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 14:32	
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	19-Dec-2019 14:32	
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 14:32	
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	19-Dec-2019 14:32	
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 14:32	
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	19-Dec-2019 14:32	
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 14:32	
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	19-Dec-2019 14:32	
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	19-Dec-2019 14:32	
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 14:32	
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	19-Dec-2019 14:32	
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	19-Dec-2019 14:32	
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 14:32	
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	19-Dec-2019 14:32	
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 14:32	
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 14:32	
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	19-Dec-2019 14:32	
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	19-Dec-2019 14:32	
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	19-Dec-2019 14:32	
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	19-Dec-2019 14:32	
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 14:32	
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 14:32	
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 14:32	

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

ALS Houston, US

Date: 06-Jan-20

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP Site 18/24
 Sample ID: 126_121719
 Collection Date: 17-Dec-2019 09:00

ANALYTICAL REPORT
 WorkOrder:HS19121036
 Lab ID:HS19121036-02
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED	
VOLATILES ORGANICS BY METHOD 8260C		Method:SW8260						Analyst: PC	
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 14:32	
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 14:32	
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	19-Dec-2019 14:32	
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 14:32	
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 14:32	
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 14:32	
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 14:32	
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	UG/L	1	19-Dec-2019 14:32	
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 14:32	
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	19-Dec-2019 14:32	
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	19-Dec-2019 14:32	
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	19-Dec-2019 14:32	
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 14:32	
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 14:32	
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 14:32	
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 14:32	
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 14:32	
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 14:32	
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 14:32	
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 14:32	
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 14:32	
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 14:32	
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 14:32	
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 14:32	
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 14:32	
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>90.3</i>			<i>0</i>	<i>81-118</i>	<i>%REC</i>	<i>1</i>	<i>19-Dec-2019 14:32</i>	
<i>Surr: 4-Bromofluorobenzene</i>	<i>101</i>			<i>0</i>	<i>85-114</i>	<i>%REC</i>	<i>1</i>	<i>19-Dec-2019 14:32</i>	
<i>Surr: Dibromofluoromethane</i>	<i>91.9</i>			<i>0</i>	<i>80-119</i>	<i>%REC</i>	<i>1</i>	<i>19-Dec-2019 14:32</i>	
<i>Surr: Toluene-d8</i>	<i>102</i>			<i>0</i>	<i>89-112</i>	<i>%REC</i>	<i>1</i>	<i>19-Dec-2019 14:32</i>	
SEMIVOLATILES SIM		Method:SW8270SIM				Prep:SW3510 / 23-Dec-2019		Analyst: LG	
1,4-Dioxane	1.8		0.10	0.10	0.10	ug/L	10	03-Jan-2020 11:41	
<i>Surr: 2-Fluorobiphenyl</i>	<i>117</i>			<i>0</i>	<i>40-140</i>	<i>%REC</i>	<i>10</i>	<i>03-Jan-2020 11:41</i>	
<i>Surr: 4-Terphenyl-d14</i>	<i>115</i>			<i>0</i>	<i>40-140</i>	<i>%REC</i>	<i>10</i>	<i>03-Jan-2020 11:41</i>	
<i>Surr: Nitrobenzene-d5</i>	<i>124</i>			<i>0</i>	<i>40-140</i>	<i>%REC</i>	<i>10</i>	<i>03-Jan-2020 11:41</i>	

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

ALS Houston, US

Date: 06-Jan-20

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP Site 18/24
 Sample ID: 126_121719
 Collection Date: 17-Dec-2019 09:00

ANALYTICAL REPORT

WorkOrder:HS19121036
 Lab ID:HS19121036-02
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A		Method:SW6020				Prep:SW3010A / 27-Dec-2019		Analyst: JHD
Aluminum	0.0570		0.00180	0.00500	0.0100	mg/L	1	03-Jan-2020 12:32
Antimony	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	03-Jan-2020 12:32
Arsenic	0.00342	J	0.000400	0.000500	0.00500	mg/L	1	03-Jan-2020 12:32
Barium	8.65		0.0950	0.125	0.250	mg/L	50	03-Jan-2020 14:43
Beryllium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	03-Jan-2020 15:30
Cadmium	0.000301	J	0.000200	0.000500	0.00200	mg/L	1	03-Jan-2020 12:32
Calcium	313		1.70	2.50	25.0	mg/L	50	03-Jan-2020 14:43
Chromium	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	03-Jan-2020 12:32
Cobalt	0.0103		0.000100	0.000500	0.00500	mg/L	1	03-Jan-2020 12:32
Copper	0.00250	U	0.00100	0.00250	0.00500	mg/L	1	03-Jan-2020 12:32
Iron	2.77		0.0120	0.0500	0.200	mg/L	1	03-Jan-2020 12:32
Lead	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	03-Jan-2020 12:32
Magnesium	235		0.500	2.50	10.0	mg/L	50	03-Jan-2020 14:43
Manganese	0.165		0.000700	0.00250	0.00500	mg/L	1	03-Jan-2020 12:32
Nickel	0.0121		0.000600	0.00100	0.00500	mg/L	1	03-Jan-2020 12:32
Potassium	3.28		0.0180	0.0500	0.200	mg/L	1	03-Jan-2020 12:32
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	03-Jan-2020 12:32
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	03-Jan-2020 12:32
Sodium	838		0.700	2.50	10.0	mg/L	50	03-Jan-2020 14:43
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	03-Jan-2020 12:32
Vanadium	0.00153	J	0.000600	0.00100	0.00500	mg/L	1	03-Jan-2020 12:32
Zinc	0.0229		0.00200	0.00250	0.00500	mg/L	1	03-Jan-2020 12:32
MERCURY BY SW7470A		Method:SW7470				Prep:SW7470 / 31-Dec-2019		Analyst: FO
Mercury	0.0000340	J	0.0000300	0.000100	0.000200	mg/L	1	31-Dec-2019 16:37
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		Method:NA				Analyst: SUB		
Subcontract Analysis	See Attached		0	0		NA	1	06-Jan-2020 14:07

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

ALS Houston, US

Date: 06-Jan-20

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP Site 18/24
 Sample ID: 126_121719_a
 Collection Date: 17-Dec-2019 09:00

ANALYTICAL REPORT
 WorkOrder:HS19121036
 Lab ID:HS19121036-03
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED	
VOLATILES ORGANICS BY METHOD 8260C		Method:SW8260							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 14:56	
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 14:56	
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	19-Dec-2019 14:56	
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 14:56	
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 14:56	
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 14:56	
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 14:56	
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	19-Dec-2019 14:56	
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	19-Dec-2019 14:56	
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	19-Dec-2019 14:56	
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 14:56	
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 14:56	
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 14:56	
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	19-Dec-2019 14:56	
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 14:56	
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	19-Dec-2019 14:56	
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 14:56	
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	19-Dec-2019 14:56	
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 14:56	
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	19-Dec-2019 14:56	
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 14:56	
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	19-Dec-2019 14:56	
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 14:56	
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	19-Dec-2019 14:56	
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	19-Dec-2019 14:56	
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 14:56	
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	19-Dec-2019 14:56	
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	19-Dec-2019 14:56	
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 14:56	
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	19-Dec-2019 14:56	
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 14:56	
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 14:56	
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	19-Dec-2019 14:56	
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	19-Dec-2019 14:56	
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	19-Dec-2019 14:56	
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	19-Dec-2019 14:56	
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 14:56	
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 14:56	
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 14:56	

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

ALS Houston, US

Date: 06-Jan-20

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP Site 18/24
 Sample ID: 126_121719_a
 Collection Date: 17-Dec-2019 09:00

ANALYTICAL REPORT
 WorkOrder:HS19121036
 Lab ID:HS19121036-03
 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	19-Dec-2019 14:56	
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 14:56	
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	19-Dec-2019 14:56	
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 14:56	
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 14:56	
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 14:56	
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 14:56	
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	UG/L	1	19-Dec-2019 14:56	
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 14:56	
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	19-Dec-2019 14:56	
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	19-Dec-2019 14:56	
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	19-Dec-2019 14:56	
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 14:56	
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 14:56	
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 14:56	
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 14:56	
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 14:56	
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 14:56	
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 14:56	
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 14:56	
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 14:56	
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 14:56	
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 14:56	
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 14:56	
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 14:56	
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>91.5</i>			0	<i>81-118</i>	%REC	<i>1</i>	<i>19-Dec-2019 14:56</i>	
<i>Surr: 4-Bromofluorobenzene</i>	<i>98.9</i>			0	<i>85-114</i>	%REC	<i>1</i>	<i>19-Dec-2019 14:56</i>	
<i>Surr: Dibromofluoromethane</i>	<i>92.9</i>			0	<i>80-119</i>	%REC	<i>1</i>	<i>19-Dec-2019 14:56</i>	
<i>Surr: Toluene-d8</i>	<i>103</i>			0	<i>89-112</i>	%REC	<i>1</i>	<i>19-Dec-2019 14:56</i>	
SEMIVOLATILES SIM		Method:SW8270SIM						Prep:SW3510 / 23-Dec-2019 Analyst: LG	
1,4-Dioxane	0.71		0.050	0.050	0.050	ug/L	5	03-Jan-2020 12:00	
<i>Surr: 2-Fluorobiphenyl</i>	<i>87.5</i>			0	<i>40-140</i>	%REC	<i>5</i>	<i>03-Jan-2020 12:00</i>	
<i>Surr: 4-Terphenyl-d14</i>	<i>70.6</i>			0	<i>40-140</i>	%REC	<i>5</i>	<i>03-Jan-2020 12:00</i>	
<i>Surr: Nitrobenzene-d5</i>	<i>87.8</i>			0	<i>40-140</i>	%REC	<i>5</i>	<i>03-Jan-2020 12:00</i>	

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

ALS Houston, US

Date: 06-Jan-20

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP Site 18/24
 Sample ID: 126_121719_a
 Collection Date: 17-Dec-2019 09:00

ANALYTICAL REPORT
 WorkOrder:HS19121036
 Lab ID:HS19121036-03
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A		Method:SW6020				Prep:SW3010A / 27-Dec-2019		Analyst: JHD
Aluminum	0.0507		0.00180	0.00500	0.0100	mg/L	1	03-Jan-2020 12:34
Antimony	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	03-Jan-2020 12:34
Arsenic	0.00323	J	0.000400	0.000500	0.00500	mg/L	1	03-Jan-2020 12:34
Barium	8.50		0.0950	0.125	0.250	mg/L	50	03-Jan-2020 14:45
Beryllium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	03-Jan-2020 15:32
Cadmium	0.000264	J	0.000200	0.000500	0.00200	mg/L	1	03-Jan-2020 12:34
Calcium	316		1.70	2.50	25.0	mg/L	50	03-Jan-2020 14:45
Chromium	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	03-Jan-2020 12:34
Cobalt	0.00992		0.000100	0.000500	0.00500	mg/L	1	03-Jan-2020 12:34
Copper	0.00250	U	0.00100	0.00250	0.00500	mg/L	1	03-Jan-2020 12:34
Iron	2.80		0.0120	0.0500	0.200	mg/L	1	03-Jan-2020 12:34
Lead	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	03-Jan-2020 12:34
Magnesium	243		0.500	2.50	10.0	mg/L	50	03-Jan-2020 14:45
Manganese	0.160		0.000700	0.00250	0.00500	mg/L	1	03-Jan-2020 12:34
Nickel	0.0119		0.000600	0.00100	0.00500	mg/L	1	03-Jan-2020 12:34
Potassium	3.23		0.0180	0.0500	0.200	mg/L	1	03-Jan-2020 12:34
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	03-Jan-2020 12:34
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	03-Jan-2020 12:34
Sodium	850		0.700	2.50	10.0	mg/L	50	03-Jan-2020 14:45
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	03-Jan-2020 12:34
Vanadium	0.00164	J	0.000600	0.00100	0.00500	mg/L	1	03-Jan-2020 12:34
Zinc	0.0228		0.00200	0.00250	0.00500	mg/L	1	03-Jan-2020 12:34
MERCURY BY SW7470A		Method:SW7470				Prep:SW7470 / 31-Dec-2019		Analyst: FO
Mercury	0.0000310	J	0.0000300	0.000100	0.000200	mg/L	1	31-Dec-2019 16:47
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		Method:NA						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	06-Jan-2020 14:07

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

ALS Houston, US

Date: 06-Jan-20

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP Site 18/24
 Sample ID: MW18_121719
 Collection Date: 17-Dec-2019 10:00

ANALYTICAL REPORT
 WorkOrder:HS19121036
 Lab ID:HS19121036-04
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED	
VOLATILES ORGANICS BY METHOD 8260C		Method:SW8260							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 15:20	
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 15:20	
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	19-Dec-2019 15:20	
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 15:20	
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 15:20	
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 15:20	
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 15:20	
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	19-Dec-2019 15:20	
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	19-Dec-2019 15:20	
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	19-Dec-2019 15:20	
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 15:20	
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 15:20	
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 15:20	
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	19-Dec-2019 15:20	
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 15:20	
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	19-Dec-2019 15:20	
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 15:20	
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	19-Dec-2019 15:20	
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 15:20	
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	19-Dec-2019 15:20	
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 15:20	
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	19-Dec-2019 15:20	
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 15:20	
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	19-Dec-2019 15:20	
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	19-Dec-2019 15:20	
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 15:20	
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	19-Dec-2019 15:20	
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	19-Dec-2019 15:20	
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 15:20	
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	19-Dec-2019 15:20	
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 15:20	
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 15:20	
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	19-Dec-2019 15:20	
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	19-Dec-2019 15:20	
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	19-Dec-2019 15:20	
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	19-Dec-2019 15:20	
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 15:20	
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 15:20	
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 15:20	

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

ALS Houston, US

Date: 06-Jan-20

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP Site 18/24
 Sample ID: MW18_121719
 Collection Date: 17-Dec-2019 10:00

ANALYTICAL REPORT
 WorkOrder:HS19121036
 Lab ID:HS19121036-04
 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	19-Dec-2019 15:20	
cis-1,2-Dichloroethene	0.81	J	0.20	0.50	1.0	UG/L	1	19-Dec-2019 15:20	
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	19-Dec-2019 15:20	
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 15:20	
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 15:20	
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 15:20	
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 15:20	
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	UG/L	1	19-Dec-2019 15:20	
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 15:20	
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	19-Dec-2019 15:20	
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	19-Dec-2019 15:20	
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	19-Dec-2019 15:20	
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 15:20	
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 15:20	
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 15:20	
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 15:20	
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 15:20	
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 15:20	
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 15:20	
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 15:20	
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 15:20	
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 15:20	
Trichloroethene	13		0.20	0.50	1.0	UG/L	1	19-Dec-2019 15:20	
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 15:20	
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 15:20	
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>90.5</i>			0	<i>81-118</i>	%REC	1	19-Dec-2019 15:20	
<i>Surr: 4-Bromofluorobenzene</i>	<i>100</i>			0	<i>85-114</i>	%REC	1	19-Dec-2019 15:20	
<i>Surr: Dibromofluoromethane</i>	<i>92.4</i>			0	<i>80-119</i>	%REC	1	19-Dec-2019 15:20	
<i>Surr: Toluene-d8</i>	<i>102</i>			0	<i>89-112</i>	%REC	1	19-Dec-2019 15:20	
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		Method:NA						Analyst: SUB	
Subcontract Analysis	See Attached		0	0		NA	1	06-Jan-2020 14:07	

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

ALS Houston, US

Date: 06-Jan-20

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP Site 18/24
 Sample ID: 120_121719
 Collection Date: 17-Dec-2019 10:55

ANALYTICAL REPORT
 WorkOrder:HS19121036
 Lab ID:HS19121036-05
 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	12	U	7.5	12	25	UG/L	25	19-Dec-2019 18:32	
1,1,1-Trichloroethane	12	U	5.0	12	25	UG/L	25	19-Dec-2019 18:32	
1,1,2,2-Tetrachloroethane	12	U	12	12	25	UG/L	25	19-Dec-2019 18:32	
1,1,2-Trichloroethane	12	U	7.5	12	25	UG/L	25	19-Dec-2019 18:32	
1,1-Dichloroethane	16	J	5.0	12	25	UG/L	25	19-Dec-2019 18:32	
1,1-Dichloroethene	79		5.0	12	25	UG/L	25	19-Dec-2019 18:32	
1,1-Dichloropropene	12	U	7.5	12	25	UG/L	25	19-Dec-2019 18:32	
1,2,3-Trichlorobenzene	12	U	10	12	25	UG/L	25	19-Dec-2019 18:32	
1,2,3-Trichloropropane	12	U	12	12	25	UG/L	25	19-Dec-2019 18:32	
1,2,4-Trichlorobenzene	12	U	12	12	25	UG/L	25	19-Dec-2019 18:32	
1,2,4-Trimethylbenzene	12	U	7.5	12	25	UG/L	25	19-Dec-2019 18:32	
1,2-Dibromo-3-chloropropane	12	U	5.0	12	25	UG/L	25	19-Dec-2019 18:32	
1,2-Dibromoethane	12	U	5.0	12	25	UG/L	25	19-Dec-2019 18:32	
1,2-Dichlorobenzene	12	U	12	12	25	UG/L	25	19-Dec-2019 18:32	
1,2-Dichloroethane	25		5.0	12	25	UG/L	25	19-Dec-2019 18:32	
1,2-Dichloropropane	12	U	12	12	25	UG/L	25	19-Dec-2019 18:32	
1,3,5-Trimethylbenzene	12	U	7.5	12	25	UG/L	25	19-Dec-2019 18:32	
1,3-Dichlorobenzene	12	U	10	12	25	UG/L	25	19-Dec-2019 18:32	
1,3-Dichloropropane	12	U	7.5	12	25	UG/L	25	19-Dec-2019 18:32	
1,4-Dichlorobenzene	12	U	10	12	25	UG/L	25	19-Dec-2019 18:32	
2,2-Dichloropropane	12	U	5.0	12	25	UG/L	25	19-Dec-2019 18:32	
2-Butanone	25	U	12	25	50	UG/L	25	19-Dec-2019 18:32	
2-Chlorotoluene	12	U	7.5	12	25	UG/L	25	19-Dec-2019 18:32	
2-Hexanone	25	U	25	25	50	UG/L	25	19-Dec-2019 18:32	
4-Chlorotoluene	12	U	10	12	25	UG/L	25	19-Dec-2019 18:32	
4-Isopropyltoluene	12	U	7.5	12	25	UG/L	25	19-Dec-2019 18:32	
4-Methyl-2-pentanone	25	U	18	25	50	UG/L	25	19-Dec-2019 18:32	
Acetone	25	U	10	25	50	UG/L	25	19-Dec-2019 18:32	
Benzene	12	U	5.0	12	25	UG/L	25	19-Dec-2019 18:32	
Bromobenzene	12	U	10	12	25	UG/L	25	19-Dec-2019 18:32	
Bromochloromethane	12	U	5.0	12	25	UG/L	25	19-Dec-2019 18:32	
Bromodichloromethane	12	U	5.0	12	25	UG/L	25	19-Dec-2019 18:32	
Bromoform	12	U	10	12	25	UG/L	25	19-Dec-2019 18:32	
Bromomethane	12	U	10	12	25	UG/L	25	19-Dec-2019 18:32	
Carbon disulfide	25	U	15	25	50	UG/L	25	19-Dec-2019 18:32	
Carbon tetrachloride	12	U	12	12	25	UG/L	25	19-Dec-2019 18:32	
Chlorobenzene	12	U	7.5	12	25	UG/L	25	19-Dec-2019 18:32	
Chloroethane	12	U	7.5	12	25	UG/L	25	19-Dec-2019 18:32	
Chloroform	20	J	5.0	12	25	UG/L	25	19-Dec-2019 18:32	

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

ALS Houston, US

Date: 06-Jan-20

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP Site 18/24
 Sample ID: 120_121719
 Collection Date: 17-Dec-2019 10:55

ANALYTICAL REPORT

WorkOrder:HS19121036
 Lab ID:HS19121036-05
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED	
VOLATILES ORGANICS BY METHOD 8260C		Method:SW8260						Analyst: PC	
Chloromethane	12	U	5.0	12	25	UG/L	25	19-Dec-2019 18:32	
cis-1,2-Dichloroethene	1,100		5.0	12	25	UG/L	25	19-Dec-2019 18:32	
cis-1,3-Dichloropropene	12	U	2.5	12	25	UG/L	25	19-Dec-2019 18:32	
Dibromochloromethane	12	U	7.5	12	25	UG/L	25	19-Dec-2019 18:32	
Dibromomethane	12	U	5.0	12	25	UG/L	25	19-Dec-2019 18:32	
Dichlorodifluoromethane	12	U	7.5	12	25	UG/L	25	19-Dec-2019 18:32	
Ethylbenzene	12	U	7.5	12	25	UG/L	25	19-Dec-2019 18:32	
Hexachlorobutadiene	12	U	25	12	25	UG/L	25	19-Dec-2019 18:32	
Isopropylbenzene	12	U	7.5	12	25	UG/L	25	19-Dec-2019 18:32	
m,p-Xylene	25	U	12	25	50	UG/L	25	19-Dec-2019 18:32	
Methylene chloride	25	U	10	25	50	UG/L	25	19-Dec-2019 18:32	
n-Butylbenzene	12	U	10	12	25	UG/L	25	19-Dec-2019 18:32	
n-Propylbenzene	12	U	7.5	12	25	UG/L	25	19-Dec-2019 18:32	
Naphthalene	12	U	7.5	12	25	UG/L	25	19-Dec-2019 18:32	
o-Xylene	12	U	7.5	12	25	UG/L	25	19-Dec-2019 18:32	
sec-Butylbenzene	12	U	7.5	12	25	UG/L	25	19-Dec-2019 18:32	
Styrene	12	U	7.5	12	25	UG/L	25	19-Dec-2019 18:32	
tert-Butylbenzene	12	U	7.5	12	25	UG/L	25	19-Dec-2019 18:32	
Tetrachloroethene	12	U	7.5	12	25	UG/L	25	19-Dec-2019 18:32	
Toluene	12	U	5.0	12	25	UG/L	25	19-Dec-2019 18:32	
trans-1,2-Dichloroethene	10	J	5.0	12	25	UG/L	25	19-Dec-2019 18:32	
trans-1,3-Dichloropropene	12	U	5.0	12	25	UG/L	25	19-Dec-2019 18:32	
Trichloroethene	9,200		50	120	250	UG/L	250	19-Dec-2019 18:56	
Trichlorofluoromethane	12	U	7.5	12	25	UG/L	25	19-Dec-2019 18:32	
Vinyl chloride	21	J	5.0	12	25	UG/L	25	19-Dec-2019 18:32	
Surr: 1,2-Dichloroethane-d4	91.7			0	81-118	%REC	25	19-Dec-2019 18:32	
Surr: 1,2-Dichloroethane-d4	91.5			0	81-118	%REC	250	19-Dec-2019 18:56	
Surr: 4-Bromofluorobenzene	98.4			0	85-114	%REC	25	19-Dec-2019 18:32	
Surr: 4-Bromofluorobenzene	98.6			0	85-114	%REC	250	19-Dec-2019 18:56	
Surr: Dibromofluoromethane	92.1			0	80-119	%REC	25	19-Dec-2019 18:32	
Surr: Dibromofluoromethane	92.8			0	80-119	%REC	250	19-Dec-2019 18:56	
Surr: Toluene-d8	102			0	89-112	%REC	25	19-Dec-2019 18:32	
Surr: Toluene-d8	101			0	89-112	%REC	250	19-Dec-2019 18:56	
SEMIVOLATILES SIM		Method:SW8270SIM						Prep:SW3510 / 23-Dec-2019 Analyst: LG	
1,4-Dioxane	48		1.0	1.0	1.0	ug/L	100	03-Jan-2020 12:19	
Surr: 2-Fluorobiphenyl	119			0	40-140	%REC	100	03-Jan-2020 12:19	
Surr: 4-Terphenyl-d14	126			0	40-140	%REC	100	03-Jan-2020 12:19	
Surr: Nitrobenzene-d5	112			0	40-140	%REC	100	03-Jan-2020 12:19	

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

ALS Houston, US

Date: 06-Jan-20

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP Site 18/24
 Sample ID: 120_121719
 Collection Date: 17-Dec-2019 10:55

ANALYTICAL REPORT

WorkOrder:HS19121036
 Lab ID:HS19121036-05
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		Method:NA		Analyst: SUB				
Subcontract Analysis	See Attached		0	0		NA	1	06-Jan-2020 14:07

ALS Houston, US

Date: 06-Jan-20

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP Site 18/24
 Sample ID: MW14_121719
 Collection Date: 17-Dec-2019 11:40

ANALYTICAL REPORT
 WorkOrder:HS19121036
 Lab ID:HS19121036-06
 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	12	U	7.5	12	25	UG/L	25	19-Dec-2019 19:20	
1,1,1-Trichloroethane	12	U	5.0	12	25	UG/L	25	19-Dec-2019 19:20	
1,1,2,2-Tetrachloroethane	12	U	12	12	25	UG/L	25	19-Dec-2019 19:20	
1,1,2-Trichloroethane	12	U	7.5	12	25	UG/L	25	19-Dec-2019 19:20	
1,1-Dichloroethane	26		5.0	12	25	UG/L	25	19-Dec-2019 19:20	
1,1-Dichloroethene	87		5.0	12	25	UG/L	25	19-Dec-2019 19:20	
1,1-Dichloropropene	12	U	7.5	12	25	UG/L	25	19-Dec-2019 19:20	
1,2,3-Trichlorobenzene	12	U	10	12	25	UG/L	25	19-Dec-2019 19:20	
1,2,3-Trichloropropane	12	U	12	12	25	UG/L	25	19-Dec-2019 19:20	
1,2,4-Trichlorobenzene	12	U	12	12	25	UG/L	25	19-Dec-2019 19:20	
1,2,4-Trimethylbenzene	12	U	7.5	12	25	UG/L	25	19-Dec-2019 19:20	
1,2-Dibromo-3-chloropropane	12	U	5.0	12	25	UG/L	25	19-Dec-2019 19:20	
1,2-Dibromoethane	12	U	5.0	12	25	UG/L	25	19-Dec-2019 19:20	
1,2-Dichlorobenzene	12	U	12	12	25	UG/L	25	19-Dec-2019 19:20	
1,2-Dichloroethane	73		5.0	12	25	UG/L	25	19-Dec-2019 19:20	
1,2-Dichloropropane	12	U	12	12	25	UG/L	25	19-Dec-2019 19:20	
1,3,5-Trimethylbenzene	12	U	7.5	12	25	UG/L	25	19-Dec-2019 19:20	
1,3-Dichlorobenzene	12	U	10	12	25	UG/L	25	19-Dec-2019 19:20	
1,3-Dichloropropane	12	U	7.5	12	25	UG/L	25	19-Dec-2019 19:20	
1,4-Dichlorobenzene	12	U	10	12	25	UG/L	25	19-Dec-2019 19:20	
2,2-Dichloropropane	12	U	5.0	12	25	UG/L	25	19-Dec-2019 19:20	
2-Butanone	25	U	12	25	50	UG/L	25	19-Dec-2019 19:20	
2-Chlorotoluene	12	U	7.5	12	25	UG/L	25	19-Dec-2019 19:20	
2-Hexanone	25	U	25	25	50	UG/L	25	19-Dec-2019 19:20	
4-Chlorotoluene	12	U	10	12	25	UG/L	25	19-Dec-2019 19:20	
4-Isopropyltoluene	12	U	7.5	12	25	UG/L	25	19-Dec-2019 19:20	
4-Methyl-2-pentanone	25	U	18	25	50	UG/L	25	19-Dec-2019 19:20	
Acetone	25	U	10	25	50	UG/L	25	19-Dec-2019 19:20	
Benzene	12	U	5.0	12	25	UG/L	25	19-Dec-2019 19:20	
Bromobenzene	12	U	10	12	25	UG/L	25	19-Dec-2019 19:20	
Bromochloromethane	12	U	5.0	12	25	UG/L	25	19-Dec-2019 19:20	
Bromodichloromethane	12	U	5.0	12	25	UG/L	25	19-Dec-2019 19:20	
Bromoform	12	U	10	12	25	UG/L	25	19-Dec-2019 19:20	
Bromomethane	12	U	10	12	25	UG/L	25	19-Dec-2019 19:20	
Carbon disulfide	25	U	15	25	50	UG/L	25	19-Dec-2019 19:20	
Carbon tetrachloride	12	U	12	12	25	UG/L	25	19-Dec-2019 19:20	
Chlorobenzene	12	U	7.5	12	25	UG/L	25	19-Dec-2019 19:20	
Chloroethane	12	U	7.5	12	25	UG/L	25	19-Dec-2019 19:20	
Chloroform	12	U	5.0	12	25	UG/L	25	19-Dec-2019 19:20	

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

ALS Houston, US

Date: 06-Jan-20

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP Site 18/24
 Sample ID: MW14_121719
 Collection Date: 17-Dec-2019 11:40

ANALYTICAL REPORT
 WorkOrder:HS19121036
 Lab ID:HS19121036-06
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED	
VOLATILES ORGANICS BY METHOD 8260C		Method:SW8260						Analyst: PC	
Chloromethane	12	U	5.0	12	25	UG/L	25	19-Dec-2019 19:20	
cis-1,2-Dichloroethene	2,100		5.0	12	25	UG/L	25	19-Dec-2019 19:20	
cis-1,3-Dichloropropene	12	U	2.5	12	25	UG/L	25	19-Dec-2019 19:20	
Dibromochloromethane	12	U	7.5	12	25	UG/L	25	19-Dec-2019 19:20	
Dibromomethane	12	U	5.0	12	25	UG/L	25	19-Dec-2019 19:20	
Dichlorodifluoromethane	12	U	7.5	12	25	UG/L	25	19-Dec-2019 19:20	
Ethylbenzene	12	U	7.5	12	25	UG/L	25	19-Dec-2019 19:20	
Hexachlorobutadiene	12	U	25	12	25	UG/L	25	19-Dec-2019 19:20	
Isopropylbenzene	12	U	7.5	12	25	UG/L	25	19-Dec-2019 19:20	
m,p-Xylene	25	U	12	25	50	UG/L	25	19-Dec-2019 19:20	
Methylene chloride	25	U	10	25	50	UG/L	25	19-Dec-2019 19:20	
n-Butylbenzene	12	U	10	12	25	UG/L	25	19-Dec-2019 19:20	
n-Propylbenzene	12	U	7.5	12	25	UG/L	25	19-Dec-2019 19:20	
Naphthalene	12	U	7.5	12	25	UG/L	25	19-Dec-2019 19:20	
o-Xylene	12	U	7.5	12	25	UG/L	25	19-Dec-2019 19:20	
sec-Butylbenzene	12	U	7.5	12	25	UG/L	25	19-Dec-2019 19:20	
Styrene	12	U	7.5	12	25	UG/L	25	19-Dec-2019 19:20	
tert-Butylbenzene	12	U	7.5	12	25	UG/L	25	19-Dec-2019 19:20	
Tetrachloroethene	12	U	7.5	12	25	UG/L	25	19-Dec-2019 19:20	
Toluene	12	U	5.0	12	25	UG/L	25	19-Dec-2019 19:20	
trans-1,2-Dichloroethene	19	J	5.0	12	25	UG/L	25	19-Dec-2019 19:20	
trans-1,3-Dichloropropene	12	U	5.0	12	25	UG/L	25	19-Dec-2019 19:20	
Trichloroethene	9,200		50	120	250	UG/L	250	19-Dec-2019 19:44	
Trichlorofluoromethane	12	U	7.5	12	25	UG/L	25	19-Dec-2019 19:20	
Vinyl chloride	12	U	5.0	12	25	UG/L	25	19-Dec-2019 19:20	
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>90.7</i>			0	<i>81-118</i>	%REC	25	19-Dec-2019 19:20	
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>91.0</i>			0	<i>81-118</i>	%REC	250	19-Dec-2019 19:44	
<i>Surr: 4-Bromofluorobenzene</i>	<i>99.1</i>			0	<i>85-114</i>	%REC	25	19-Dec-2019 19:20	
<i>Surr: 4-Bromofluorobenzene</i>	<i>99.3</i>			0	<i>85-114</i>	%REC	250	19-Dec-2019 19:44	
<i>Surr: Dibromofluoromethane</i>	<i>91.8</i>			0	<i>80-119</i>	%REC	25	19-Dec-2019 19:20	
<i>Surr: Dibromofluoromethane</i>	<i>93.0</i>			0	<i>80-119</i>	%REC	250	19-Dec-2019 19:44	
<i>Surr: Toluene-d8</i>	<i>101</i>			0	<i>89-112</i>	%REC	25	19-Dec-2019 19:20	
<i>Surr: Toluene-d8</i>	<i>102</i>			0	<i>89-112</i>	%REC	250	19-Dec-2019 19:44	
SEMIVOLATILES SIM		Method:SW8270SIM						Prep:SW3510 / 23-Dec-2019 Analyst: LG	
1,4-Dioxane	390		10	10	10	ug/L	1000	03-Jan-2020 12:38	
<i>Surr: 2-Fluorobiphenyl</i>	<i>0</i>	<i>S</i>		0	<i>40-140</i>	%REC	1000	03-Jan-2020 12:38	
<i>Surr: 4-Terphenyl-d14</i>	<i>0</i>	<i>S</i>		0	<i>40-140</i>	%REC	1000	03-Jan-2020 12:38	
<i>Surr: Nitrobenzene-d5</i>	<i>0</i>	<i>S</i>		0	<i>40-140</i>	%REC	1000	03-Jan-2020 12:38	

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

ALS Houston, US

Date: 06-Jan-20

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP Site 18/24
 Sample ID: MW14_121719
 Collection Date: 17-Dec-2019 11:40

ANALYTICAL REPORT
 WorkOrder:HS19121036
 Lab ID:HS19121036-06
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A			Method:SW6020			Prep:SW3010A / 27-Dec-2019		Analyst: JHD
Aluminum	0.0444		0.00180	0.00500	0.0100	mg/L	1	03-Jan-2020 12:36
Antimony	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	03-Jan-2020 12:36
Arsenic	0.00751		0.000400	0.000500	0.00500	mg/L	1	03-Jan-2020 12:36
Barium	0.202		0.00190	0.00250	0.00500	mg/L	1	03-Jan-2020 12:36
Beryllium	0.000360	J	0.000200	0.000500	0.00200	mg/L	1	03-Jan-2020 14:27
Cadmium	0.000887	J	0.000200	0.000500	0.00200	mg/L	1	03-Jan-2020 12:36
Calcium	87.4		0.0340	0.0500	0.500	mg/L	1	03-Jan-2020 12:36
Chromium	0.0844		0.000400	0.000500	0.00500	mg/L	1	03-Jan-2020 12:36
Cobalt	0.0415		0.000100	0.000500	0.00500	mg/L	1	03-Jan-2020 12:36
Copper	0.00180	J	0.00100	0.00250	0.00500	mg/L	1	03-Jan-2020 12:36
Iron	101		0.0120	0.0500	0.200	mg/L	1	03-Jan-2020 12:36
Lead	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	03-Jan-2020 12:36
Magnesium	51.6		0.0100	0.0500	0.200	mg/L	1	03-Jan-2020 12:36
Manganese	3.76		0.0140	0.0500	0.100	mg/L	20	03-Jan-2020 14:47
Nickel	0.112		0.000600	0.00100	0.00500	mg/L	1	03-Jan-2020 12:36
Potassium	10.1		0.0180	0.0500	0.200	mg/L	1	03-Jan-2020 12:36
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	03-Jan-2020 12:36
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	03-Jan-2020 12:36
Sodium	363		0.280	1.00	4.00	mg/L	20	03-Jan-2020 14:47
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	03-Jan-2020 12:36
Vanadium	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	03-Jan-2020 12:36
Zinc	0.761		0.00200	0.00250	0.00500	mg/L	1	03-Jan-2020 12:36
MERCURY BY SW7470A			Method:SW7470			Prep:SW7470 / 31-Dec-2019		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	31-Dec-2019 16:48
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)			Method:NA			Analyst: SUB		
Subcontract Analysis	See Attached		0	0		NA	1	06-Jan-2020 14:07

ALS Houston, US

Date: 06-Jan-20

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP Site 18/24
 Sample ID: 18CPTMW04SW_121719
 Collection Date: 17-Dec-2019 12:35

ANALYTICAL REPORT
 WorkOrder:HS19121036
 Lab ID:HS19121036-07
 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	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 15:44	
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 15:44	
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	19-Dec-2019 15:44	
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 15:44	
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 15:44	
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 15:44	
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 15:44	
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	19-Dec-2019 15:44	
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	19-Dec-2019 15:44	
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	19-Dec-2019 15:44	
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 15:44	
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 15:44	
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 15:44	
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	19-Dec-2019 15:44	
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 15:44	
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	19-Dec-2019 15:44	
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 15:44	
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	19-Dec-2019 15:44	
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 15:44	
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	19-Dec-2019 15:44	
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 15:44	
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	19-Dec-2019 15:44	
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 15:44	
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	19-Dec-2019 15:44	
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	19-Dec-2019 15:44	
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 15:44	
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	19-Dec-2019 15:44	
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	19-Dec-2019 15:44	
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 15:44	
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	19-Dec-2019 15:44	
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 15:44	
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 15:44	
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	19-Dec-2019 15:44	
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	19-Dec-2019 15:44	
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	19-Dec-2019 15:44	
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	19-Dec-2019 15:44	
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 15:44	
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 15:44	
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 15:44	

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

ALS Houston, US

Date: 06-Jan-20

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP Site 18/24
 Sample ID: 18CPTMW04SW_121719
 Collection Date: 17-Dec-2019 12:35

ANALYTICAL REPORT
 WorkOrder:HS19121036
 Lab ID:HS19121036-07
 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	19-Dec-2019 15:44		
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 15:44		
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	19-Dec-2019 15:44		
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 15:44		
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 15:44		
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 15:44		
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 15:44		
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	UG/L	1	19-Dec-2019 15:44		
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 15:44		
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	19-Dec-2019 15:44		
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	19-Dec-2019 15:44		
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	19-Dec-2019 15:44		
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 15:44		
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 15:44		
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 15:44		
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 15:44		
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 15:44		
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 15:44		
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 15:44		
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 15:44		
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 15:44		
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 15:44		
Trichloroethene	0.82	J	0.20	0.50	1.0	UG/L	1	19-Dec-2019 15:44		
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 15:44		
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 15:44		
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>91.3</i>			0	<i>81-118</i>	%REC	1	<i>19-Dec-2019 15:44</i>		
<i>Surr: 4-Bromofluorobenzene</i>	<i>98.0</i>			0	<i>85-114</i>	%REC	1	<i>19-Dec-2019 15:44</i>		
<i>Surr: Dibromofluoromethane</i>	<i>93.5</i>			0	<i>80-119</i>	%REC	1	<i>19-Dec-2019 15:44</i>		
<i>Surr: Toluene-d8</i>	<i>103</i>			0	<i>89-112</i>	%REC	1	<i>19-Dec-2019 15:44</i>		
SEMIVOLATILES SIM		Method:SW8270SIM							Prep:SW3510 / 23-Dec-2019	Analyst: LG
1,4-Dioxane	1.6		0.050	0.050	0.050	ug/L	5	03-Jan-2020 12:57		
<i>Surr: 2-Fluorobiphenyl</i>	<i>112</i>			0	<i>40-140</i>	%REC	5	<i>03-Jan-2020 12:57</i>		
<i>Surr: 4-Terphenyl-d14</i>	<i>103</i>			0	<i>40-140</i>	%REC	5	<i>03-Jan-2020 12:57</i>		
<i>Surr: Nitrobenzene-d5</i>	<i>113</i>			0	<i>40-140</i>	%REC	5	<i>03-Jan-2020 12:57</i>		

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

ALS Houston, US

Date: 06-Jan-20

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP Site 18/24
 Sample ID: 18CPTMW04SW_121719
 Collection Date: 17-Dec-2019 12:35

ANALYTICAL REPORT
 WorkOrder:HS19121036
 Lab ID:HS19121036-07
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A		Method:SW6020				Prep:SW3010A / 27-Dec-2019		Analyst: JHD
Aluminum	0.0524		0.00180	0.00500	0.0100	mg/L	1	03-Jan-2020 12:39
Antimony	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	03-Jan-2020 12:39
Arsenic	0.00167	J	0.000400	0.000500	0.00500	mg/L	1	03-Jan-2020 12:39
Barium	0.680		0.00190	0.00250	0.00500	mg/L	1	03-Jan-2020 12:39
Beryllium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	03-Jan-2020 14:41
Cadmium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	03-Jan-2020 12:39
Calcium	24.2		0.0340	0.0500	0.500	mg/L	1	03-Jan-2020 12:39
Chromium	0.00722		0.000400	0.000500	0.00500	mg/L	1	03-Jan-2020 12:39
Cobalt	0.00212	J	0.000100	0.000500	0.00500	mg/L	1	03-Jan-2020 12:39
Copper	0.00250	U	0.00100	0.00250	0.00500	mg/L	1	03-Jan-2020 12:39
Iron	4.45		0.0120	0.0500	0.200	mg/L	1	03-Jan-2020 12:39
Lead	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	03-Jan-2020 12:39
Magnesium	14.7		0.0100	0.0500	0.200	mg/L	1	03-Jan-2020 12:39
Manganese	0.196		0.000700	0.00250	0.00500	mg/L	1	03-Jan-2020 12:39
Nickel	0.00408	J	0.000600	0.00100	0.00500	mg/L	1	03-Jan-2020 12:39
Potassium	57.0		0.0180	0.0500	0.200	mg/L	1	03-Jan-2020 12:39
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	03-Jan-2020 12:39
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	03-Jan-2020 12:39
Sodium	105		0.0140	0.0500	0.200	mg/L	1	03-Jan-2020 12:39
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	03-Jan-2020 12:39
Vanadium	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	03-Jan-2020 12:39
Zinc	0.0153		0.00200	0.00250	0.00500	mg/L	1	03-Jan-2020 12:39
MERCURY BY SW7470A		Method:SW7470				Prep:SW7470 / 31-Dec-2019		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	31-Dec-2019 16:50
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		Method:NA				Analyst: SUB		
Subcontract Analysis	See Attached		0	0		NA	1	06-Jan-2020 14:07

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

ALS Houston, US

Date: 06-Jan-20

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP Site 18/24
 Sample ID: 18CPTMW04_121719
 Collection Date: 17-Dec-2019 13:25

ANALYTICAL REPORT
 WorkOrder:HS19121036
 Lab ID:HS19121036-08
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED	
VOLATILES ORGANICS BY METHOD 8260C		Method:SW8260							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 16:08	
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 16:08	
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	19-Dec-2019 16:08	
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 16:08	
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 16:08	
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 16:08	
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 16:08	
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	19-Dec-2019 16:08	
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	19-Dec-2019 16:08	
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	19-Dec-2019 16:08	
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 16:08	
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 16:08	
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 16:08	
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	19-Dec-2019 16:08	
1,2-Dichloroethane	1.1		0.20	0.50	1.0	UG/L	1	19-Dec-2019 16:08	
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	19-Dec-2019 16:08	
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 16:08	
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	19-Dec-2019 16:08	
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 16:08	
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	19-Dec-2019 16:08	
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 16:08	
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	19-Dec-2019 16:08	
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 16:08	
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	19-Dec-2019 16:08	
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	19-Dec-2019 16:08	
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 16:08	
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	19-Dec-2019 16:08	
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	19-Dec-2019 16:08	
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 16:08	
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	19-Dec-2019 16:08	
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 16:08	
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 16:08	
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	19-Dec-2019 16:08	
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	19-Dec-2019 16:08	
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	19-Dec-2019 16:08	
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	19-Dec-2019 16:08	
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 16:08	
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 16:08	
Chloroform	0.84	J	0.20	0.50	1.0	UG/L	1	19-Dec-2019 16:08	

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

ALS Houston, US

Date: 06-Jan-20

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP Site 18/24
 Sample ID: 18CPTMW04_121719
 Collection Date: 17-Dec-2019 13:25

ANALYTICAL REPORT

WorkOrder:HS19121036
 Lab ID:HS19121036-08
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED		
VOLATILES ORGANICS BY METHOD 8260C		Method:SW8260							Analyst: PC	
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 16:08		
cis-1,2-Dichloroethene	19		0.20	0.50	1.0	UG/L	1	19-Dec-2019 16:08		
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	19-Dec-2019 16:08		
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 16:08		
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 16:08		
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 16:08		
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 16:08		
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	UG/L	1	19-Dec-2019 16:08		
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 16:08		
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	19-Dec-2019 16:08		
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	19-Dec-2019 16:08		
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	19-Dec-2019 16:08		
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 16:08		
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 16:08		
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 16:08		
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 16:08		
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 16:08		
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 16:08		
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 16:08		
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 16:08		
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 16:08		
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 16:08		
Trichloroethene	660		5.0	12	25	UG/L	25	19-Dec-2019 18:08		
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 16:08		
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 16:08		
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>90.6</i>			0	<i>81-118</i>	%REC	1	19-Dec-2019 16:08		
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>90.7</i>			0	<i>81-118</i>	%REC	25	19-Dec-2019 18:08		
<i>Surr: 4-Bromofluorobenzene</i>	<i>98.6</i>			0	<i>85-114</i>	%REC	1	19-Dec-2019 16:08		
<i>Surr: 4-Bromofluorobenzene</i>	<i>100.0</i>			0	<i>85-114</i>	%REC	25	19-Dec-2019 18:08		
<i>Surr: Dibromofluoromethane</i>	<i>92.4</i>			0	<i>80-119</i>	%REC	1	19-Dec-2019 16:08		
<i>Surr: Dibromofluoromethane</i>	<i>92.8</i>			0	<i>80-119</i>	%REC	25	19-Dec-2019 18:08		
<i>Surr: Toluene-d8</i>	<i>102</i>			0	<i>89-112</i>	%REC	1	19-Dec-2019 16:08		
<i>Surr: Toluene-d8</i>	<i>101</i>			0	<i>89-112</i>	%REC	25	19-Dec-2019 18:08		
SEMIVOLATILES SIM		Method:SW8270SIM							Prep:SW3510 / 23-Dec-2019	Analyst: LG
1,4-Dioxane	2.8		0.10	0.10	0.10	ug/L	10	03-Jan-2020 13:16		
<i>Surr: 2-Fluorobiphenyl</i>	<i>122</i>			0	<i>40-140</i>	%REC	10	03-Jan-2020 13:16		
<i>Surr: 4-Terphenyl-d14</i>	<i>105</i>			0	<i>40-140</i>	%REC	10	03-Jan-2020 13:16		
<i>Surr: Nitrobenzene-d5</i>	<i>114</i>			0	<i>40-140</i>	%REC	10	03-Jan-2020 13:16		

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

ALS Houston, US

Date: 06-Jan-20

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP Site 18/24
 Sample ID: 18CPTMW04_121719
 Collection Date: 17-Dec-2019 13:25

ANALYTICAL REPORT

WorkOrder:HS19121036
 Lab ID:HS19121036-08
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		Method:NA		Analyst: SUB				
Subcontract Analysis	See Attached		0	0		NA	1	06-Jan-2020 14:07

ALS Houston, US

Date: 06-Jan-20

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP Site 18/24
 Sample ID: Trip Blank
 Collection Date: 17-Dec-2019 00:00

ANALYTICAL REPORT
 WorkOrder:HS19121036
 Lab ID:HS19121036-09
 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED	
VOLATILES ORGANICS BY METHOD 8260C		Method:SW8260							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 13:44	
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 13:44	
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	19-Dec-2019 13:44	
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 13:44	
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 13:44	
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 13:44	
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 13:44	
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	19-Dec-2019 13:44	
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	19-Dec-2019 13:44	
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	19-Dec-2019 13:44	
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 13:44	
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 13:44	
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 13:44	
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	19-Dec-2019 13:44	
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 13:44	
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	19-Dec-2019 13:44	
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 13:44	
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	19-Dec-2019 13:44	
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 13:44	
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	19-Dec-2019 13:44	
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 13:44	
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	19-Dec-2019 13:44	
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 13:44	
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	19-Dec-2019 13:44	
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	19-Dec-2019 13:44	
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 13:44	
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	19-Dec-2019 13:44	
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	19-Dec-2019 13:44	
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 13:44	
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	19-Dec-2019 13:44	
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 13:44	
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 13:44	
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	19-Dec-2019 13:44	
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	19-Dec-2019 13:44	
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	19-Dec-2019 13:44	
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	19-Dec-2019 13:44	
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 13:44	
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 13:44	
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 13:44	

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

ALS Houston, US

Date: 06-Jan-20

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP Site 18/24
 Sample ID: Trip Blank
 Collection Date: 17-Dec-2019 00:00

ANALYTICAL REPORT
 WorkOrder:HS19121036
 Lab ID:HS19121036-09
 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED	
VOLATILES ORGANICS BY METHOD		Method:SW8260							Analyst: PC
8260C									
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 13:44	
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 13:44	
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	19-Dec-2019 13:44	
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 13:44	
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 13:44	
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 13:44	
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 13:44	
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	UG/L	1	19-Dec-2019 13:44	
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 13:44	
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	19-Dec-2019 13:44	
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	19-Dec-2019 13:44	
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	19-Dec-2019 13:44	
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 13:44	
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 13:44	
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 13:44	
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 13:44	
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 13:44	
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 13:44	
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 13:44	
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 13:44	
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 13:44	
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 13:44	
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 13:44	
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 13:44	
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 13:44	
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>91.5</i>			<i>0</i>	<i>81-118</i>	<i>%REC</i>	<i>1</i>	<i>19-Dec-2019 13:44</i>	
<i>Surr: 4-Bromofluorobenzene</i>	<i>98.5</i>			<i>0</i>	<i>85-114</i>	<i>%REC</i>	<i>1</i>	<i>19-Dec-2019 13:44</i>	
<i>Surr: Dibromofluoromethane</i>	<i>93.1</i>			<i>0</i>	<i>80-119</i>	<i>%REC</i>	<i>1</i>	<i>19-Dec-2019 13:44</i>	
<i>Surr: Toluene-d8</i>	<i>103</i>			<i>0</i>	<i>89-112</i>	<i>%REC</i>	<i>1</i>	<i>19-Dec-2019 13:44</i>	

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

Weight / Prep Log

Client: Bhate Environmental Associates, Inc.

Project: LHAAP Site 18/24

WorkOrder: HS19121036

Batch ID: 149052	Start Date: 23 Dec 2019 10:00	End Date: 23 Dec 2019 18:00
Method: SV AQ SEP FUN EXTRACT-LOWLEV - 3510C	Prep Code: 3510_B_SIM	

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19121036-02	1	1000 (mL)	1 (mL)	0.001
HS19121036-03	1	1000 (mL)	1 (mL)	0.001
HS19121036-05	1	1000 (mL)	1 (mL)	0.001
HS19121036-06	1	1000 (mL)	1 (mL)	0.001
HS19121036-07	1	1000 (mL)	1 (mL)	0.001
HS19121036-08	1	1000 (mL)	1 (mL)	0.001

Batch ID: 149161	Start Date: 27 Dec 2019 09:00	End Date: 27 Dec 2019 13:00
Method: WATER - SW3010A	Prep Code: 3010A	

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19121036-01		10 (mL)	10 (mL)	1
HS19121036-02		10 (mL)	10 (mL)	1
HS19121036-03		10 (mL)	10 (mL)	1
HS19121036-06		10 (mL)	10 (mL)	1
HS19121036-07		10 (mL)	10 (mL)	1

Batch ID: 149282	Start Date: 31 Dec 2019 10:30	End Date: 31 Dec 2019 12:30
Method: MERCURY PREP BY 7470A- WATER	Prep Code: HG_WPR	

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19121036-01		10 (mL)	10 (mL)	1
HS19121036-02		10 (mL)	10 (mL)	1
HS19121036-03		10 (mL)	10 (mL)	1
HS19121036-06		10 (mL)	10 (mL)	1
HS19121036-07		10 (mL)	10 (mL)	1

ALS Houston, US

Date: 06-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: LHAAP Site 18/24
WorkOrder: HS19121036

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: 149052 (0)		Test Name : SEMIVOLATILES SIM			Matrix: Groundwater	
HS19121036-02	126_121719	17 Dec 2019 09:00		23 Dec 2019 16:50	03 Jan 2020 11:41	10
HS19121036-03	126_121719_a	17 Dec 2019 09:00		23 Dec 2019 16:50	03 Jan 2020 12:00	5
HS19121036-05	120_121719	17 Dec 2019 10:55		23 Dec 2019 16:50	03 Jan 2020 12:19	100
HS19121036-06	MW14_121719	17 Dec 2019 11:40		23 Dec 2019 16:50	03 Jan 2020 12:38	1000
HS19121036-07	18CPTMW04SW_121719	17 Dec 2019 12:35		23 Dec 2019 16:50	03 Jan 2020 12:57	5
HS19121036-08	18CPTMW04_121719	17 Dec 2019 13:25		23 Dec 2019 16:50	03 Jan 2020 13:16	10
Batch ID: 149161 (0)		Test Name : METALS BY ICPMS BY SW6020A			Matrix: Groundwater	
HS19121036-01	C09_121719	17 Dec 2019 08:00		27 Dec 2019 13:00	03 Jan 2020 14:34	20
HS19121036-01	C09_121719	17 Dec 2019 08:00		27 Dec 2019 13:00	03 Jan 2020 12:10	1
HS19121036-02	126_121719	17 Dec 2019 09:00		27 Dec 2019 13:00	03 Jan 2020 15:30	1
HS19121036-02	126_121719	17 Dec 2019 09:00		27 Dec 2019 13:00	03 Jan 2020 14:43	50
HS19121036-02	126_121719	17 Dec 2019 09:00		27 Dec 2019 13:00	03 Jan 2020 12:32	1
HS19121036-03	126_121719_a	17 Dec 2019 09:00		27 Dec 2019 13:00	03 Jan 2020 15:32	1
HS19121036-03	126_121719_a	17 Dec 2019 09:00		27 Dec 2019 13:00	03 Jan 2020 14:45	50
HS19121036-03	126_121719_a	17 Dec 2019 09:00		27 Dec 2019 13:00	03 Jan 2020 12:34	1
HS19121036-06	MW14_121719	17 Dec 2019 11:40		27 Dec 2019 13:00	03 Jan 2020 14:47	20
HS19121036-06	MW14_121719	17 Dec 2019 11:40		27 Dec 2019 13:00	03 Jan 2020 14:27	1
HS19121036-06	MW14_121719	17 Dec 2019 11:40		27 Dec 2019 13:00	03 Jan 2020 12:36	1
HS19121036-07	18CPTMW04SW_121719	17 Dec 2019 12:35		27 Dec 2019 13:00	03 Jan 2020 14:41	1
HS19121036-07	18CPTMW04SW_121719	17 Dec 2019 12:35		27 Dec 2019 13:00	03 Jan 2020 12:39	1
Batch ID: 149282 (0)		Test Name : MERCURY BY SW7470A			Matrix: Groundwater	
HS19121036-01	C09_121719	17 Dec 2019 08:00		31 Dec 2019 10:30	31 Dec 2019 16:42	1
HS19121036-02	126_121719	17 Dec 2019 09:00		31 Dec 2019 10:30	31 Dec 2019 16:37	1
HS19121036-03	126_121719_a	17 Dec 2019 09:00		31 Dec 2019 10:30	31 Dec 2019 16:47	1
HS19121036-06	MW14_121719	17 Dec 2019 11:40		31 Dec 2019 10:30	31 Dec 2019 16:48	1
HS19121036-07	18CPTMW04SW_121719	17 Dec 2019 12:35		31 Dec 2019 10:30	31 Dec 2019 16:50	1
Batch ID: R352981 (0)		Test Name : VOLATILES ORGANICS BY METHOD 8260C			Matrix: Water	
HS19121036-09	Trip Blank	17 Dec 2019 00:00			19 Dec 2019 13:44	1

ALS Houston, US

Date: 06-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: LHAAP Site 18/24
WorkOrder: HS19121036

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R352981 (0)		Test Name : VOLATILES ORGANICS BY METHOD 8260C			Matrix: Groundwater	
HS19121036-01	C09_121719	17 Dec 2019 08:00			19 Dec 2019 14:08	1
HS19121036-02	126_121719	17 Dec 2019 09:00			19 Dec 2019 14:32	1
HS19121036-03	126_121719_a	17 Dec 2019 09:00			19 Dec 2019 14:56	1
HS19121036-04	MW18_121719	17 Dec 2019 10:00			19 Dec 2019 15:20	1
HS19121036-05	120_121719	17 Dec 2019 10:55			19 Dec 2019 18:56	250
HS19121036-05	120_121719	17 Dec 2019 10:55			19 Dec 2019 18:32	25
HS19121036-06	MW14_121719	17 Dec 2019 11:40			19 Dec 2019 19:44	250
HS19121036-06	MW14_121719	17 Dec 2019 11:40			19 Dec 2019 19:20	25
HS19121036-07	18CPTMW04SW_121719	17 Dec 2019 12:35			19 Dec 2019 15:44	1
HS19121036-08	18CPTMW04_121719	17 Dec 2019 13:25			19 Dec 2019 18:08	25
HS19121036-08	18CPTMW04_121719	17 Dec 2019 13:25			19 Dec 2019 16:08	1
Batch ID: R353891 (0)		Test Name : SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)			Matrix: Groundwater	
HS19121036-01	C09_121719	17 Dec 2019 08:00			06 Jan 2020 14:07	1
HS19121036-02	126_121719	17 Dec 2019 09:00			06 Jan 2020 14:07	1
HS19121036-03	126_121719_a	17 Dec 2019 09:00			06 Jan 2020 14:07	1
HS19121036-04	MW18_121719	17 Dec 2019 10:00			06 Jan 2020 14:07	1
HS19121036-05	120_121719	17 Dec 2019 10:55			06 Jan 2020 14:07	1
HS19121036-06	MW14_121719	17 Dec 2019 11:40			06 Jan 2020 14:07	1
HS19121036-07	18CPTMW04SW_121719	17 Dec 2019 12:35			06 Jan 2020 14:07	1
HS19121036-08	18CPTMW04_121719	17 Dec 2019 13:25			06 Jan 2020 14:07	1

ALS Houston, US

Date: 06-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: LHAAP Site 18/24
WorkOrder: HS19121036

QC BATCH REPORT

Batch ID: 149161 (0)		Instrument: ICPMS05		Method: METALS BY ICPMS BY SW6020A						
LCS	Sample ID: LCS-149161	Units: mg/L			Analysis Date: 03-Jan-2020 12:03					
Client ID:	Run ID: ICPMS05_353764	SeqNo: 5423039	PrepDate: 27-Dec-2019	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.1102	0.0100	0.1	0	110	84 - 117				
Antimony	0.0493	0.00500	0.05	0	98.6	85 - 117				
Arsenic	0.05072	0.00500	0.05	0	101	84 - 116				
Barium	0.04802	0.00500	0.05	0	96.0	86 - 114				
Beryllium	0.04659	0.00200	0.05	0	93.2	83 - 121				
Cadmium	0.05061	0.00200	0.05	0	101	87 - 115				
Calcium	5.169	0.500	5	0	103	87 - 118				
Chromium	0.05067	0.00500	0.05	0	101	85 - 116				
Cobalt	0.04913	0.00500	0.05	0	98.3	86 - 115				
Copper	0.0519	0.00500	0.05	0	104	85 - 118				
Iron	5.272	0.200	5	0	105	87 - 118				
Lead	0.04497	0.00500	0.05	0	89.9	88 - 115				
Magnesium	5.263	0.200	5	0	105	83 - 118				
Manganese	0.05123	0.00500	0.05	0	102	87 - 115				
Nickel	0.05142	0.00500	0.05	0	103	85 - 117				
Potassium	5.331	0.200	5	0	107	87 - 115				
Selenium	0.05073	0.00500	0.05	0	101	80 - 120				
Silver	0.04571	0.00500	0.05	0	91.4	85 - 116				
Sodium	5.164	0.200	5	0	103	85 - 117				
Thallium	0.0429	0.00200	0.05	0	85.8	82 - 116				
Vanadium	0.05011	0.00500	0.05	0	100	86 - 115				
Zinc	0.05326	0.00500	0.05	0	107	83 - 119				

ALS Houston, US

Date: 06-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: LHAAP Site 18/24
WorkOrder: HS19121036

QC BATCH REPORT

Batch ID: 149161 (0)		Instrument: ICPMS05		Method: METALS BY ICPMS BY SW6020A						
MS	Sample ID: HS19121036-01MS	Units: mg/L			Analysis Date: 03-Jan-2020 12:14					
Client ID: C09_121719	Run ID: ICPMS05_353764	SeqNo: 5423044	PrepDate: 27-Dec-2019	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.3471	0.0100	0.2	0.1494	98.9	84 - 117				
Antimony	0.04798	0.00500	0.05	0	96.0	85 - 117				
Arsenic	0.04954	0.00500	0.05	0	99.1	84 - 116				
Barium	1.028	0.00500	0.05	0.948	160	86 - 114				SO
Beryllium	0.04682	0.00200	0.05	0	93.6	83 - 121				
Cadmium	0.04785	0.00200	0.05	0.000207	95.3	87 - 115				
Calcium	234.3	0.500	5	228.5	115	87 - 118				EO
Chromium	0.05164	0.00500	0.05	0.002556	98.2	85 - 116				
Cobalt	0.0471	0.00500	0.05	0.001038	92.1	86 - 115				
Copper	0.04777	0.00500	0.05	0	95.5	85 - 118				
Iron	5.167	0.200	5	0.1594	100	87 - 118				
Lead	0.04824	0.00500	0.05	0	96.5	88 - 115				
Magnesium	84.46	0.200	5	79.11	107	83 - 118				O
Manganese	0.2187	0.00500	0.05	0.1694	98.6	87 - 115				
Nickel	0.07377	0.00500	0.05	0.02497	97.6	85 - 117				
Potassium	6.101	0.200	5	0.977	102	87 - 115				
Selenium	0.04827	0.00500	0.05	0	96.5	80 - 120				
Silver	0.04288	0.00500	0.05	0	85.8	85 - 116				
Sodium	251.3	0.200	5	246.4	98.0	85 - 117				EO
Thallium	0.04508	0.00200	0.05	0	90.2	82 - 116				
Vanadium	0.05112	0.00500	0.05	0	102	86 - 115				
Zinc	0.05699	0.00500	0.05	0.007335	99.3	83 - 119				

ALS Houston, US

Date: 06-Jan-20

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP Site 18/24
 WorkOrder: HS19121036

QC BATCH REPORT

Batch ID: 149161 (0)		Instrument: ICPMS05		Method: METALS BY ICPMS BY SW6020A						
MSD	Sample ID: HS19121036-01MSD	Units: mg/L			Analysis Date: 03-Jan-2020 12:17					
Client ID: C09_121719	Run ID: ICPMS05_353764	SeqNo: 5423045	PrepDate: 27-Dec-2019	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.3514	0.0100	0.2	0.1494	101	84 - 117	0.3471	1.21	20	
Antimony	0.04736	0.00500	0.05	0	94.7	85 - 117	0.04798	1.29	20	
Arsenic	0.04823	0.00500	0.05	0	96.5	84 - 116	0.04954	2.68	20	
Barium	1.013	0.00500	0.05	0.948	129	86 - 114	1.028	1.49	20	SO
Beryllium	0.04523	0.00200	0.05	0	90.5	83 - 121	0.04682	3.47	20	
Cadmium	0.04711	0.00200	0.05	0.000207	93.8	87 - 115	0.04785	1.56	20	
Calcium	224.9	0.500	5	228.5	-73.1	87 - 118	234.3	4.1	20	SEO
Chromium	0.05033	0.00500	0.05	0.002556	95.5	85 - 116	0.05164	2.57	20	
Cobalt	0.04592	0.00500	0.05	0.001038	89.8	86 - 115	0.0471	2.53	20	
Copper	0.04626	0.00500	0.05	0	92.5	85 - 118	0.04777	3.21	20	
Iron	5.065	0.200	5	0.1594	98.1	87 - 118	5.167	2	20	
Lead	0.04721	0.00500	0.05	0	94.4	88 - 115	0.04824	2.15	20	
Magnesium	82.16	0.200	5	79.11	61.1	83 - 118	84.46	2.76	20	SO
Manganese	0.215	0.00500	0.05	0.1694	91.2	87 - 115	0.2187	1.71	20	
Nickel	0.06998	0.00500	0.05	0.02497	90.0	85 - 117	0.07377	5.27	20	
Potassium	5.945	0.200	5	0.977	99.4	87 - 115	6.101	2.59	20	
Selenium	0.04721	0.00500	0.05	0	94.4	80 - 120	0.04827	2.22	20	
Silver	0.04207	0.00500	0.05	0	84.1	85 - 116	0.04288	1.9	20	S
Sodium	246.8	0.200	5	246.4	6.88	85 - 117	251.3	1.83	20	SEO
Thallium	0.04504	0.00200	0.05	0	90.1	82 - 116	0.04508	0.107	20	
Vanadium	0.04999	0.00500	0.05	0	100.0	86 - 115	0.05112	2.23	20	
Zinc	0.05446	0.00500	0.05	0.007335	94.2	83 - 119	0.05699	4.55	20	

ALS Houston, US

Date: 06-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: LHAAP Site 18/24
WorkOrder: HS19121036

QC BATCH REPORT

Batch ID: 149161 (0)		Instrument: ICPMS05		Method: METALS BY ICPMS BY SW6020A						
PDS	Sample ID: HS19121036-01PDS	Units: mg/L			Analysis Date: 03-Jan-2020 12:19					
Client ID: C09_121719	Run ID: ICPMS05_353764	SeqNo: 5423046		PrepDate: 27-Dec-2019		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual	
Aluminum	0.3168	0.0100	0.2	0.1494	83.7	80 - 120				
Antimony	0.08414	0.00500	0.1	0	84.1	80 - 120				
Arsenic	0.09811	0.00500	0.1	0	98.1	80 - 120				
Barium	1.036	0.00500	0.1	0.948	87.5	80 - 120			O	
Beryllium	0.08608	0.00200	0.1	0	86.1	80 - 120				
Cadmium	0.09617	0.00200	0.1	0.000207	96.0	80 - 120				
Chromium	0.09735	0.00500	0.1	0.002556	94.8	80 - 120				
Cobalt	0.09065	0.00500	0.1	0.001038	89.6	80 - 120				
Copper	0.0925	0.00500	0.1	0	92.5	80 - 120				
Iron	9.775	0.200	10	0.1594	96.2	80 - 120				
Lead	0.09409	0.00500	0.1	0	94.1	80 - 120				
Magnesium	87.73	0.200	10	79.11	86.2	80 - 120			O	
Manganese	0.26	0.00500	0.1	0.1694	90.6	80 - 120				
Nickel	0.1244	0.00500	0.1	0.02497	99.4	80 - 120				
Potassium	10.82	0.200	10	0.977	98.4	80 - 120				
Selenium	0.09604	0.00500	0.1	0	96.0	80 - 120				
Silver	0.08248	0.00500	0.1	0	82.5	80 - 120				
Thallium	0.09582	0.00200	0.1	0	95.8	80 - 120				
Vanadium	0.09789	0.00500	0.1	0	97.9	80 - 120				
Zinc	0.1015	0.00500	0.1	0.007335	94.1	80 - 120				
PDS	Sample ID: HS19121036-01PDS	Units: mg/L			Analysis Date: 03-Jan-2020 14:39					
Client ID: C09_121719	Run ID: ICPMS05_353764	SeqNo: 5423162		PrepDate: 27-Dec-2019		DF: 20				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual	
Calcium	423.5	10.0	200	235.8	93.9	80 - 120				
Sodium	442.3	4.00	200	256.4	93.0	80 - 120				

ALS Houston, US

Date: 06-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: LHAAP Site 18/24
WorkOrder: HS19121036

QC BATCH REPORT

Batch ID: 149161 (0)		Instrument: ICPMS05		Method: METALS BY ICPMS BY SW6020A						
SD	Sample ID: HS19121036-01SD	Units: mg/L			Analysis Date: 03-Jan-2020 12:12					
Client ID: C09_121719	Run ID: ICPMS05_353764	SeqNo: 5423043	PrepDate: 27-Dec-2019	DF: 5						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit Qual	
Antimony	0.00250	0.0250					0.00029	0 10	U	
Arsenic	0.00250	0.0250					0.000238	0 10	U	
Barium	0.9045	0.0250					0.948	4.59 10		
Beryllium	0.00250	0.0100					0.000023	0 10	U	
Cadmium	0.00250	0.0100					0.000207	0 10	U	
Chromium	0.002444	0.0250					0.002556	0 10	J	
Cobalt	0.001044	0.0250					0.001038	0 10	J	
Copper	0.0125	0.0250					0.000644	0 10	U	
Iron	0.1589	1.00					0.1594	0 10	J	
Lead	0.00500	0.0250					0.000231	0 10	U	
Magnesium	78.8	1.00					79.11	0.391 10		
Manganese	0.1734	0.0250					0.1694	2.4 10		
Nickel	0.02591	0.0250					0.02497	0 10		
Potassium	1.019	1.00					0.977	0 10		
Selenium	0.0125	0.0250					-0.000016	0 10	U	
Silver	0.00250	0.0250					0.000017	0 10	U	
Thallium	0.00250	0.0100					0.00004	0 10	U	
Vanadium	0.004047	0.0250					0.000523	0 10	J	
Zinc	0.01053	0.0250					0.007335	0 10	J	

SD	Sample ID: HS19121036-01SD	Units: mg/L			Analysis Date: 03-Jan-2020 14:36				
Client ID: C09_121719	Run ID: ICPMS05_353764	SeqNo: 5423161	PrepDate: 27-Dec-2019	DF: 100					
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit Qual
Calcium	246	50.0					235.8	4.33 10	
Sodium	273.8	20.0					256.4	6.79 10	

The following samples were analyzed in this batch: HS19121036-01 HS19121036-02 HS19121036-03 HS19121036-06
 HS19121036-07

ALS Houston, US

Date: 06-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: LHAAP Site 18/24
WorkOrder: HS19121036

QC BATCH REPORT

Batch ID: 149282 (0)		Instrument: HG03		Method: MERCURY BY SW7470A						
MBLK	Sample ID: MBLK-149282	Units: mg/L		Analysis Date: 31-Dec-2019 15:58						
Client ID:		Run ID: HG03_353659	SeqNo: 5419066	PrepDate: 31-Dec-2019	DF: 1					
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual	
Mercury	0.000100	0.000200							U	
LCS	Sample ID: LCS-149282	Units: mg/L		Analysis Date: 31-Dec-2019 15:59						
Client ID:		Run ID: HG03_353659	SeqNo: 5419067	PrepDate: 31-Dec-2019	DF: 1					
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual	
Mercury	0.00521	0.000200	0.005	0	104	80 - 120				
MS	Sample ID: HS19121036-01MS	Units: mg/L		Analysis Date: 31-Dec-2019 16:43						
Client ID: C09_121719		Run ID: HG03_353659	SeqNo: 5419333	PrepDate: 31-Dec-2019	DF: 1					
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual	
Mercury	0.00511	0.000200	0.005	0.00002300	102	82 - 119				
MS	Sample ID: HS19120967-01MS	Units: mg/L		Analysis Date: 31-Dec-2019 16:08						
Client ID:		Run ID: HG03_353659	SeqNo: 5419069	PrepDate: 31-Dec-2019	DF: 1					
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual	
Mercury	0.00523	0.000200	0.005	0.00001600	104	75 - 125				
MSD	Sample ID: HS19121036-01MSD	Units: mg/L		Analysis Date: 31-Dec-2019 16:45						
Client ID: C09_121719		Run ID: HG03_353659	SeqNo: 5419334	PrepDate: 31-Dec-2019	DF: 1					
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual	
Mercury	0.00525	0.000200	0.005	0.00002300	105	82 - 119	0.005110	2.7	20	
MSD	Sample ID: HS19120967-01MSD	Units: mg/L		Analysis Date: 31-Dec-2019 16:09						
Client ID:		Run ID: HG03_353659	SeqNo: 5419070	PrepDate: 31-Dec-2019	DF: 1					
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual	
Mercury	0.00511	0.000200	0.005	0.00001600	102	75 - 125	0.005230	2.32	20	

The following samples were analyzed in this batch: HS19121036-01 HS19121036-02 HS19121036-03 HS19121036-06
 HS19121036-07

ALS Houston, US

Date: 06-Jan-20

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP Site 18/24
 WorkOrder: HS19121036

QC BATCH REPORT

Batch ID: 149052 (0)		Instrument: SV-6		Method: SEMIVOLATILES SIM						
MBLK	Sample ID: MBLK-149052	Units: ug/L			Analysis Date: 03-Jan-2020 08:09					
Client ID:	Run ID: SV-6_353793	SeqNo: 5422856		PrepDate: 23-Dec-2019		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
1,4-Dioxane	0.010	0.010							U	
Surr: 2-Fluorobiphenyl	0.0793	0	0.08	0	99.1	40 - 140				
Surr: 4-Terphenyl-d14	0.07561	0	0.08	0	94.5	40 - 140				
Surr: Nitrobenzene-d5	0.09516	0	0.08	0	119	40 - 140				
LCS	Sample ID: LCS-149052	Units: ug/L			Analysis Date: 03-Jan-2020 08:30					
Client ID:	Run ID: SV-6_353793	SeqNo: 5422857		PrepDate: 23-Dec-2019		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
1,4-Dioxane	0.08925	0.010	0.08	0	112	40 - 140				
Surr: 2-Fluorobiphenyl	0.07233	0	0.08	0	90.4	40 - 140				
Surr: 4-Terphenyl-d14	0.07642	0	0.08	0	95.5	40 - 140				
Surr: Nitrobenzene-d5	0.08855	0	0.08	0	111	40 - 140				
LCSD	Sample ID: LCSD-149052	Units: ug/L			Analysis Date: 03-Jan-2020 08:49					
Client ID:	Run ID: SV-6_353793	SeqNo: 5422858		PrepDate: 23-Dec-2019		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
1,4-Dioxane	0.08544	0.010	0.08	0	107	40 - 140	0.08925	4.36	20	
Surr: 2-Fluorobiphenyl	0.08515	0	0.08	0	106	40 - 140	0.07233	16.3	20	
Surr: 4-Terphenyl-d14	0.0791	0	0.08	0	98.9	40 - 140	0.07642	3.44	20	
Surr: Nitrobenzene-d5	0.08955	0	0.08	0	112	40 - 140	0.08855	1.13	20	
The following samples were analyzed in this batch:				HS19121036-02	HS19121036-03	HS19121036-05	HS19121036-06			
				HS19121036-07	HS19121036-08					

ALS Houston, US

Date: 06-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: LHAAP Site 18/24
WorkOrder: HS19121036

QC BATCH REPORT

Batch ID: R352981 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MBLK	Sample ID: VBLKW-191219	Units: UG/L			Analysis Date: 19-Dec-2019 12:08					
Client ID:	Run ID: VOA6_352981	SeqNo: 5402183	PrepDate:	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	1.0	2.0								U
Carbon tetrachloride	0.50	1.0								U
Chlorobenzene	0.50	1.0								U
Chloroethane	0.50	1.0								U
Chloroform	0.50	1.0								U
Chloromethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
cis-1,3-Dichloropropene	0.50	1.0								U
Dibromochloromethane	0.50	1.0								U
Dibromomethane	0.50	1.0								U
Dichlorodifluoromethane	0.50	1.0								U
Ethylbenzene	0.50	1.0								U
Hexachlorobutadiene	0.50	1.0								U
Isopropylbenzene	0.50	1.0								U
m,p-Xylene	1.0	2.0								U
Methylene chloride	1.0	2.0								U
Naphthalene	0.50	1.0								U
n-Butylbenzene	0.50	1.0								U
n-Propylbenzene	0.50	1.0								U
o-Xylene	0.50	1.0								U
sec-Butylbenzene	0.50	1.0								U
Styrene	0.50	1.0								U
tert-Butylbenzene	0.50	1.0								U
Tetrachloroethene	0.50	1.0								U
Toluene	0.50	1.0								U
trans-1,2-Dichloroethene	0.50	1.0								U
trans-1,3-Dichloropropene	0.50	1.0								U
Trichloroethene	0.50	1.0								U
Trichlorofluoromethane	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	45.73	1.0	50	0	91.5	81 - 118				
Surr: 4-Bromofluorobenzene	48.64	1.0	50	0	97.3	85 - 114				
Surr: Dibromofluoromethane	46.18	1.0	50	0	92.4	80 - 119				
Surr: Toluene-d8	51.75	1.0	50	0	103	89 - 112				

ALS Houston, US

Date: 06-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: LHAAP Site 18/24
WorkOrder: HS19121036

QC BATCH REPORT

Batch ID: R352981 (0)		Instrument: VOA6			Method: VOLATILES ORGANICS BY METHOD 8260C					
LCS	Sample ID: VLCSW-191219	Units: UG/L			Analysis Date: 19-Dec-2019 11:19					
Client ID:	Run ID: VOA6_352981	SeqNo: 5402182		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	19.14	1.0	20	0	95.7	78 - 124				
1,1,1-Trichloroethane	18.87	1.0	20	0	94.4	74 - 131				
1,1,2,2-Tetrachloroethane	20.89	1.0	20	0	104	71 - 121				
1,1,2-Trichloroethane	20.08	1.0	20	0	100	80 - 119				
1,1-Dichloroethane	20.88	1.0	20	0	104	77 - 125				
1,1-Dichloroethene	15.74	1.0	20	0	78.7	71 - 131				
1,1-Dichloropropene	18.62	1.0	20	0	93.1	78 - 125				
1,2,3-Trichlorobenzene	31.42	1.0	20	0	157	69 - 129				S
1,2,3-Trichloropropane	21.66	1.0	20	0	108	73 - 122				
1,2,4-Trichlorobenzene	26.27	1.0	20	0	131	69 - 130				S
1,2,4-Trimethylbenzene	21.06	1.0	20	0	105	76 - 124				
1,2-Dibromo-3-chloropropane	22.22	1.0	20	0	111	62 - 128				
1,2-Dibromoethane	19.76	1.0	20	0	98.8	77 - 121				
1,2-Dichlorobenzene	20.08	1.0	20	0	100	80 - 119				
1,2-Dichloroethane	19.23	1.0	20	0	96.2	73 - 128				
1,2-Dichloropropane	20.1	1.0	20	0	101	78 - 122				
1,3,5-Trimethylbenzene	21.42	1.0	20	0	107	75 - 124				
1,3-Dichlorobenzene	20.37	1.0	20	0	102	80 - 119				
1,3-Dichloropropane	20.15	1.0	20	0	101	80 - 119				
1,4-Dichlorobenzene	20.18	1.0	20	0	101	79 - 118				
2,2-Dichloropropane	19.17	1.0	20	0	95.8	60 - 139				
2-Butanone	42.22	2.0	40	0	106	56 - 143				
2-Chlorotoluene	22.06	1.0	20	0	110	79 - 122				
2-Hexanone	39.63	2.0	40	0	99.1	57 - 139				
4-Chlorotoluene	20.89	1.0	20	0	104	78 - 122				
4-Isopropyltoluene	20.51	1.0	20	0	103	77 - 127				
4-Methyl-2-pentanone	40.44	2.0	40	0	101	67 - 130				
Acetone	35.12	2.0	40	0	87.8	39 - 160				
Benzene	20.65	1.0	20	0	103	79 - 120				
Bromobenzene	20.49	1.0	20	0	102	80 - 120				
Bromochloromethane	20.09	1.0	20	0	100	78 - 123				
Bromodichloromethane	19.6	1.0	20	0	98.0	79 - 125				
Bromoform	19.07	1.0	20	0	95.4	66 - 130				
Bromomethane	16.32	1.0	20	0	81.6	53 - 141				

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Date: 06-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: LHAAP Site 18/24
WorkOrder: HS19121036

QC BATCH REPORT

Batch ID: R352981 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
LCS	Sample ID: VLCSW-191219	Units: UG/L			Analysis Date: 19-Dec-2019 11:19					
Client ID:	Run ID: VOA6_352981	SeqNo: 5402182	PrepDate:	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	43.35	2.0	40	0	108	64 - 133				
Carbon tetrachloride	17.19	1.0	20	0	85.9	72 - 136				
Chlorobenzene	19.18	1.0	20	0	95.9	82 - 118				
Chloroethane	16.32	1.0	20	0	81.6	60 - 138				
Chloroform	18.93	1.0	20	0	94.7	79 - 124				
Chloromethane	15.6	1.0	20	0	78.0	50 - 139				
cis-1,2-Dichloroethene	21.34	1.0	20	0	107	78 - 123				
cis-1,3-Dichloropropene	20.24	1.0	20	0	101	75 - 124				
Dibromochloromethane	19.47	1.0	20	0	97.4	74 - 126				
Dibromomethane	19.11	1.0	20	0	95.6	79 - 123				
Dichlorodifluoromethane	18.21	1.0	20	0	91.1	32 - 152				
Ethylbenzene	19.65	1.0	20	0	98.3	79 - 121				
Hexachlorobutadiene	25.4	1.0	20	0	127	66 - 134				
Isopropylbenzene	19.28	1.0	20	0	96.4	72 - 131				
m,p-Xylene	39.21	2.0	40	0	98.0	80 - 121				
Methylene chloride	19.78	2.0	20	0	98.9	74 - 124				
Naphthalene	24.37	1.0	20	0	122	61 - 128				
n-Butylbenzene	20.18	1.0	20	0	101	75 - 128				
n-Propylbenzene	20.78	1.0	20	0	104	76 - 126				
o-Xylene	19.57	1.0	20	0	97.8	78 - 122				
sec-Butylbenzene	20.66	1.0	20	0	103	77 - 126				
Styrene	19.44	1.0	20	0	97.2	78 - 123				
tert-Butylbenzene	20.72	1.0	20	0	104	78 - 124				
Tetrachloroethene	18.14	1.0	20	0	90.7	74 - 129				
Toluene	19.82	1.0	20	0	99.1	80 - 121				
trans-1,2-Dichloroethene	20.86	1.0	20	0	104	75 - 124				
trans-1,3-Dichloropropene	19.9	1.0	20	0	99.5	73 - 127				
Trichloroethene	19.48	1.0	20	0	97.4	79 - 123				
Trichlorofluoromethane	15.03	1.0	20	0	75.1	65 - 141				
Vinyl chloride	16.63	1.0	20	0	83.2	58 - 137				
Surr: 1,2-Dichloroethane-d4	46.66	1.0	50	0	93.3	81 - 118				
Surr: 4-Bromofluorobenzene	47.21	1.0	50	0	94.4	85 - 114				
Surr: Dibromofluoromethane	46.77	1.0	50	0	93.5	80 - 119				
Surr: Toluene-d8	44.52	1.0	50	0	89.0	89 - 112				

ALS Houston, US

Date: 06-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: LHAAP Site 18/24
WorkOrder: HS19121036

QC BATCH REPORT

Batch ID: R352981 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MS	Sample ID: HS19121036-04MS	Units: UG/L			Analysis Date: 19-Dec-2019 17:20					
Client ID: MW18_121719	Run ID: VOA6_352981	SeqNo: 5402196	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	19.4	1.0	20	0	97.0	78 - 124				
1,1,1-Trichloroethane	17.71	1.0	20	0	88.6	74 - 131				
1,1,2,2-Tetrachloroethane	20.78	1.0	20	0	104	71 - 121				
1,1,2-Trichloroethane	19.77	1.0	20	0	98.9	80 - 119				
1,1-Dichloroethane	18.05	1.0	20	0	90.3	77 - 125				
1,1-Dichloroethene	13.2	1.0	20	0	66.0	71 - 131				S
1,1-Dichloropropene	18.71	1.0	20	0	93.5	78 - 125				
1,2,3-Trichlorobenzene	23.01	1.0	20	0	115	69 - 129				
1,2,3-Trichloropropane	21.15	1.0	20	0	106	73 - 122				
1,2,4-Trichlorobenzene	20.17	1.0	20	0	101	69 - 130				
1,2,4-Trimethylbenzene	21.92	1.0	20	0	110	76 - 124				
1,2-Dibromo-3-chloropropane	19.8	1.0	20	0	99.0	62 - 128				
1,2-Dibromoethane	19.39	1.0	20	0	96.9	77 - 121				
1,2-Dichlorobenzene	20.29	1.0	20	0	101	80 - 119				
1,2-Dichloroethane	17.6	1.0	20	0	88.0	73 - 128				
1,2-Dichloropropane	18.64	1.0	20	0	93.2	78 - 122				
1,3,5-Trimethylbenzene	22.44	1.0	20	0	112	75 - 124				
1,3-Dichlorobenzene	21.03	1.0	20	0	105	80 - 119				
1,3-Dichloropropane	20.05	1.0	20	0	100	80 - 119				
1,4-Dichlorobenzene	20.62	1.0	20	0	103	79 - 118				
2,2-Dichloropropane	17.33	1.0	20	0	86.6	60 - 139				
2-Butanone	33.34	2.0	40	0	83.3	56 - 143				
2-Chlorotoluene	22.97	1.0	20	0	115	79 - 122				
2-Hexanone	36.79	2.0	40	0	92.0	57 - 139				
4-Chlorotoluene	21.68	1.0	20	0	108	78 - 122				
4-Isopropyltoluene	22.05	1.0	20	0	110	77 - 127				
4-Methyl-2-pentanone	38.47	2.0	40	0	96.2	67 - 130				
Acetone	21.11	2.0	40	0	52.8	39 - 160				
Benzene	19.51	1.0	20	0	97.6	79 - 120				
Bromobenzene	21.28	1.0	20	0	106	80 - 120				
Bromochloromethane	17.18	1.0	20	0	85.9	78 - 123				
Bromodichloromethane	18.05	1.0	20	0	90.2	79 - 125				
Bromoform	18.6	1.0	20	0	93.0	66 - 130				
Bromomethane	8.02	1.0	20	0	40.1	53 - 141				S

ALS Houston, US

Date: 06-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: LHAAP Site 18/24
WorkOrder: HS19121036

QC BATCH REPORT

Batch ID: R352981 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MS	Sample ID: HS19121036-04MS	Units: UG/L			Analysis Date: 19-Dec-2019 17:20					
Client ID: MW18_121719	Run ID: VOA6_352981	SeqNo: 5402196	PrepDate:	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	31.05	2.0	40	0	77.6	64 - 133				
Carbon tetrachloride	17.87	1.0	20	0	89.4	72 - 136				
Chlorobenzene	19.53	1.0	20	0	97.7	82 - 118				
Chloroethane	10.31	1.0	20	0	51.5	60 - 138				S
Chloroform	16.9	1.0	20	0	84.5	79 - 124				
Chloromethane	4.721	1.0	20	0	23.6	50 - 139				S
cis-1,2-Dichloroethene	19.32	1.0	20	0.8057	92.6	78 - 123				
cis-1,3-Dichloropropene	18.77	1.0	20	0	93.9	75 - 124				
Dibromochloromethane	19.14	1.0	20	0	95.7	74 - 126				
Dibromomethane	17.65	1.0	20	0	88.2	79 - 123				
Dichlorodifluoromethane	2.281	1.0	20	0	11.4	32 - 152				S
Ethylbenzene	20.58	1.0	20	0	103	79 - 121				
Hexachlorobutadiene	20.21	1.0	20	0	101	66 - 134				
Isopropylbenzene	20.66	1.0	20	0	103	72 - 131				
m,p-Xylene	40.67	2.0	40	0	102	80 - 121				
Methylene chloride	16.6	2.0	20	0	83.0	74 - 124				
Naphthalene	20.02	1.0	20	0	100	61 - 128				
n-Butylbenzene	21.64	1.0	20	0	108	75 - 128				
n-Propylbenzene	22.55	1.0	20	0	113	76 - 126				
o-Xylene	20.22	1.0	20	0	101	78 - 122				
sec-Butylbenzene	22.65	1.0	20	0	113	77 - 126				
Styrene	19.99	1.0	20	0	100.0	78 - 123				
tert-Butylbenzene	22.63	1.0	20	0	113	78 - 124				
Tetrachloroethene	19.55	1.0	20	0	97.7	74 - 129				
Toluene	20.51	1.0	20	0	103	80 - 121				
trans-1,2-Dichloroethene	17.82	1.0	20	0	89.1	75 - 124				
trans-1,3-Dichloropropene	18.06	1.0	20	0	90.3	73 - 127				
Trichloroethene	32.47	1.0	20	12.97	97.5	79 - 123				
Trichlorofluoromethane	11.65	1.0	20	0	58.3	65 - 141				S
Vinyl chloride	7.24	1.0	20	0	36.2	58 - 137				S
Surr: 1,2-Dichloroethane-d4	45.06	1.0	50	0	90.1	81 - 118				
Surr: 4-Bromofluorobenzene	50.29	1.0	50	0	101	85 - 114				
Surr: Dibromofluoromethane	45.9	1.0	50	0	91.8	80 - 119				
Surr: Toluene-d8	51.51	1.0	50	0	103	89 - 112				

ALS Houston, US

Date: 06-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: LHAAP Site 18/24
WorkOrder: HS19121036

QC BATCH REPORT

Batch ID: R352981 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MS		Sample ID: HS19121036-01MS		Units: UG/L		Analysis Date: 19-Dec-2019 16:32				
Client ID: C09_121719		Run ID: VOA6_352981		SeqNo: 5402194		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	18.81	1.0	20	0	94.0	78 - 124				
1,1,1-Trichloroethane	17.47	1.0	20	0	87.3	74 - 131				
1,1,2,2-Tetrachloroethane	19.54	1.0	20	0	97.7	71 - 121				
1,1,2-Trichloroethane	18.87	1.0	20	0	94.3	80 - 119				
1,1-Dichloroethane	18.12	1.0	20	0	90.6	77 - 125				
1,1-Dichloroethene	13.26	1.0	20	0	66.3	71 - 131			S	
1,1-Dichloropropene	18.92	1.0	20	0	94.6	78 - 125				
1,2,3-Trichlorobenzene	22.05	1.0	20	0	110	69 - 129				
1,2,3-Trichloropropane	19.84	1.0	20	0	99.2	73 - 122				
1,2,4-Trichlorobenzene	20.8	1.0	20	0	104	69 - 130				
1,2,4-Trimethylbenzene	20.4	1.0	20	0	102	76 - 124				
1,2-Dibromo-3-chloropropane	18.75	1.0	20	0	93.7	62 - 128				
1,2-Dibromoethane	18.62	1.0	20	0	93.1	77 - 121				
1,2-Dichlorobenzene	18.95	1.0	20	0	94.7	80 - 119				
1,2-Dichloroethane	17.08	1.0	20	0	85.4	73 - 128				
1,2-Dichloropropane	18.72	1.0	20	0	93.6	78 - 122				
1,3,5-Trimethylbenzene	21.04	1.0	20	0	105	75 - 124				
1,3-Dichlorobenzene	19.41	1.0	20	0	97.0	80 - 119				
1,3-Dichloropropane	19.03	1.0	20	0	95.2	80 - 119				
1,4-Dichlorobenzene	19.16	1.0	20	0	95.8	79 - 118				
2,2-Dichloropropane	17.33	1.0	20	0	86.6	60 - 139				
2-Butanone	32.49	2.0	40	0	81.2	56 - 143				
2-Chlorotoluene	21.44	1.0	20	0	107	79 - 122				
2-Hexanone	35.63	2.0	40	0	89.1	57 - 139				
4-Chlorotoluene	20.26	1.0	20	0	101	78 - 122				
4-Isopropyltoluene	20.61	1.0	20	0	103	77 - 127				
4-Methyl-2-pentanone	36.71	2.0	40	0	91.8	67 - 130				
Acetone	20.74	2.0	40	0	51.9	39 - 160				
Benzene	19.32	1.0	20	0	96.6	79 - 120				
Bromobenzene	19.97	1.0	20	0	99.9	80 - 120				
Bromochloromethane	17.11	1.0	20	0	85.6	78 - 123				
Bromodichloromethane	17.8	1.0	20	0	89.0	79 - 125				
Bromoform	17.79	1.0	20	0	89.0	66 - 130				
Bromomethane	8.471	1.0	20	0	42.4	53 - 141			S	

ALS Houston, US

Date: 06-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: LHAAP Site 18/24
WorkOrder: HS19121036

QC BATCH REPORT

Batch ID: R352981 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MS	Sample ID: HS19121036-01MS	Units: UG/L			Analysis Date: 19-Dec-2019 16:32					
Client ID: C09_121719	Run ID: VOA6_352981	SeqNo: 5402194	PrepDate:	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	30.91	2.0	40	0	77.3	64 - 133				
Carbon tetrachloride	17.89	1.0	20	0	89.5	72 - 136				
Chlorobenzene	18.74	1.0	20	0	93.7	82 - 118				
Chloroethane	10.26	1.0	20	0	51.3	60 - 138				S
Chloroform	16.81	1.0	20	0	84.0	79 - 124				
Chloromethane	4.904	1.0	20	0	24.5	50 - 139				S
cis-1,2-Dichloroethene	18.25	1.0	20	0	91.2	78 - 123				
cis-1,3-Dichloropropene	18.68	1.0	20	0	93.4	75 - 124				
Dibromochloromethane	18.5	1.0	20	0	92.5	74 - 126				
Dibromomethane	17.5	1.0	20	0	87.5	79 - 123				
Dichlorodifluoromethane	2.343	1.0	20	0	11.7	32 - 152				S
Ethylbenzene	19.82	1.0	20	0	99.1	79 - 121				
Hexachlorobutadiene	21.08	1.0	20	0	105	66 - 134				
Isopropylbenzene	19.75	1.0	20	0	98.7	72 - 131				
m,p-Xylene	39.43	2.0	40	0	98.6	80 - 121				
Methylene chloride	16.71	2.0	20	0	83.6	74 - 124				
Naphthalene	18.98	1.0	20	0	94.9	61 - 128				
n-Butylbenzene	20.21	1.0	20	0	101	75 - 128				
n-Propylbenzene	21.15	1.0	20	0	106	76 - 126				
o-Xylene	19.38	1.0	20	0	96.9	78 - 122				
sec-Butylbenzene	20.87	1.0	20	0	104	77 - 126				
Styrene	19.01	1.0	20	0	95.0	78 - 123				
tert-Butylbenzene	20.94	1.0	20	0	105	78 - 124				
Tetrachloroethene	18.84	1.0	20	0	94.2	74 - 129				
Toluene	19.81	1.0	20	0	99.0	80 - 121				
trans-1,2-Dichloroethene	17.88	1.0	20	0	89.4	75 - 124				
trans-1,3-Dichloropropene	17.93	1.0	20	0	89.7	73 - 127				
Trichloroethene	19.97	1.0	20	0	99.9	79 - 123				
Trichlorofluoromethane	11.81	1.0	20	0	59.0	65 - 141				S
Vinyl chloride	7.34	1.0	20	0	36.7	58 - 137				S
Surr: 1,2-Dichloroethane-d4	46.32	1.0	50	0	92.6	81 - 118				
Surr: 4-Bromofluorobenzene	49.95	1.0	50	0	99.9	85 - 114				
Surr: Dibromofluoromethane	46.16	1.0	50	0	92.3	80 - 119				
Surr: Toluene-d8	50.34	1.0	50	0	101	89 - 112				

ALS Houston, US

Date: 06-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: LHAAP Site 18/24
WorkOrder: HS19121036

QC BATCH REPORT

Batch ID: R352981 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MSD	Sample ID: HS19121036-04MSD	Units: UG/L			Analysis Date: 19-Dec-2019 17:44					
Client ID: MW18_121719	Run ID: VOA6_352981	SeqNo: 5402197	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	18.86	1.0	20	0	94.3	78 - 124	19.4	2.81	20	
1,1,1-Trichloroethane	16.86	1.0	20	0	84.3	74 - 131	17.71	4.92	20	
1,1,2,2-Tetrachloroethane	20.23	1.0	20	0	101	71 - 121	20.78	2.7	20	
1,1,2-Trichloroethane	19.33	1.0	20	0	96.7	80 - 119	19.77	2.27	20	
1,1-Dichloroethane	17.16	1.0	20	0	85.8	77 - 125	18.05	5.05	20	
1,1-Dichloroethene	12.55	1.0	20	0	62.7	71 - 131	13.2	5.06	20	S
1,1-Dichloropropene	18.06	1.0	20	0	90.3	78 - 125	18.71	3.51	20	
1,2,3-Trichlorobenzene	24.69	1.0	20	0	123	69 - 129	23.01	7.03	20	
1,2,3-Trichloropropane	20.27	1.0	20	0	101	73 - 122	21.15	4.28	20	
1,2,4-Trichlorobenzene	20.81	1.0	20	0	104	69 - 130	20.17	3.12	20	
1,2,4-Trimethylbenzene	20.73	1.0	20	0	104	76 - 124	21.92	5.56	20	
1,2-Dibromo-3-chloropropane	21.26	1.0	20	0	106	62 - 128	19.8	7.11	20	
1,2-Dibromoethane	19.09	1.0	20	0	95.4	77 - 121	19.39	1.58	20	
1,2-Dichlorobenzene	19.61	1.0	20	0	98.1	80 - 119	20.29	3.42	20	
1,2-Dichloroethane	17.16	1.0	20	0	85.8	73 - 128	17.6	2.54	20	
1,2-Dichloropropane	18.07	1.0	20	0	90.3	78 - 122	18.64	3.15	20	
1,3,5-Trimethylbenzene	21.51	1.0	20	0	108	75 - 124	22.44	4.27	20	
1,3-Dichlorobenzene	20.23	1.0	20	0	101	80 - 119	21.03	3.91	20	
1,3-Dichloropropane	19.48	1.0	20	0	97.4	80 - 119	20.05	2.86	20	
1,4-Dichlorobenzene	19.82	1.0	20	0	99.1	79 - 118	20.62	3.97	20	
2,2-Dichloropropane	16.14	1.0	20	0	80.7	60 - 139	17.33	7.11	20	
2-Butanone	33.42	2.0	40	0	83.5	56 - 143	33.34	0.236	20	
2-Chlorotoluene	21.79	1.0	20	0	109	79 - 122	22.97	5.3	20	
2-Hexanone	37.19	2.0	40	0	93.0	57 - 139	36.79	1.08	20	
4-Chlorotoluene	20.77	1.0	20	0	104	78 - 122	21.68	4.29	20	
4-Isopropyltoluene	20.96	1.0	20	0	105	77 - 127	22.05	5.05	20	
4-Methyl-2-pentanone	37.41	2.0	40	0	93.5	67 - 130	38.47	2.8	20	
Acetone	21.56	2.0	40	0	53.9	39 - 160	21.11	2.1	20	
Benzene	18.81	1.0	20	0	94.1	79 - 120	19.51	3.63	20	
Bromobenzene	20.21	1.0	20	0	101	80 - 120	21.28	5.15	20	
Bromochloromethane	16.65	1.0	20	0	83.3	78 - 123	17.18	3.09	20	
Bromodichloromethane	17.66	1.0	20	0	88.3	79 - 125	18.05	2.17	20	
Bromoform	18.29	1.0	20	0	91.5	66 - 130	18.6	1.66	20	
Bromomethane	7.386	1.0	20	0	36.9	53 - 141	8.02	8.23	20	S

ALS Houston, US

Date: 06-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: LHAAP Site 18/24
WorkOrder: HS19121036

QC BATCH REPORT

Batch ID: R352981 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MSD	Sample ID: HS19121036-04MSD	Units: UG/L			Analysis Date: 19-Dec-2019 17:44					
Client ID: MW18_121719	Run ID: VOA6_352981	SeqNo: 5402197	PrepDate:	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	29.17	2.0	40	0	72.9	64 - 133	31.05	6.27	20	
Carbon tetrachloride	17.14	1.0	20	0	85.7	72 - 136	17.87	4.21	20	
Chlorobenzene	18.75	1.0	20	0	93.8	82 - 118	19.53	4.07	20	
Chloroethane	9.716	1.0	20	0	48.6	60 - 138	10.31	5.93	20	S
Chloroform	16.43	1.0	20	0	82.1	79 - 124	16.9	2.82	20	
Chloromethane	4.642	1.0	20	0	23.2	50 - 139	4.721	1.67	20	S
cis-1,2-Dichloroethene	18.7	1.0	20	0.8057	89.5	78 - 123	19.32	3.25	20	
cis-1,3-Dichloropropene	18.44	1.0	20	0	92.2	75 - 124	18.77	1.77	20	
Dibromochloromethane	18.8	1.0	20	0	94.0	74 - 126	19.14	1.8	20	
Dibromomethane	17.47	1.0	20	0	87.3	79 - 123	17.65	1.03	20	
Dichlorodifluoromethane	2.182	1.0	20	0	10.9	32 - 152	2.281	4.47	20	S
Ethylbenzene	19.55	1.0	20	0	97.7	79 - 121	20.58	5.15	20	
Hexachlorobutadiene	19.9	1.0	20	0	99.5	66 - 134	20.21	1.58	20	
Isopropylbenzene	19.69	1.0	20	0	98.5	72 - 131	20.66	4.83	20	
m,p-Xylene	38.9	2.0	40	0	97.2	80 - 121	40.67	4.47	20	
Methylene chloride	16.3	2.0	20	0	81.5	74 - 124	16.6	1.8	20	
Naphthalene	21.56	1.0	20	0	108	61 - 128	20.02	7.4	20	
n-Butylbenzene	20.69	1.0	20	0	103	75 - 128	21.64	4.48	20	
n-Propylbenzene	21.27	1.0	20	0	106	76 - 126	22.55	5.86	20	
o-Xylene	19.29	1.0	20	0	96.5	78 - 122	20.22	4.69	20	
sec-Butylbenzene	21.17	1.0	20	0	106	77 - 126	22.65	6.78	20	
Styrene	18.57	1.0	20	0	92.9	78 - 123	19.99	7.36	20	
tert-Butylbenzene	21.41	1.0	20	0	107	78 - 124	22.63	5.56	20	
Tetrachloroethene	18.46	1.0	20	0	92.3	74 - 129	19.55	5.75	20	
Toluene	19.5	1.0	20	0	97.5	80 - 121	20.51	5.03	20	
trans-1,2-Dichloroethene	17.04	1.0	20	0	85.2	75 - 124	17.82	4.47	20	
trans-1,3-Dichloropropene	17.63	1.0	20	0	88.2	73 - 127	18.06	2.41	20	
Trichloroethene	31.02	1.0	20	12.97	90.3	79 - 123	32.47	4.55	20	
Trichlorofluoromethane	10.99	1.0	20	0	54.9	65 - 141	11.65	5.87	20	S
Vinyl chloride	6.735	1.0	20	0	33.7	58 - 137	7.24	7.23	20	S
Surr: 1,2-Dichloroethane-d4	45.16	1.0	50	0	90.3	81 - 118	45.06	0.232	20	
Surr: 4-Bromofluorobenzene	50	1.0	50	0	100.0	85 - 114	50.29	0.579	20	
Surr: Dibromofluoromethane	45.87	1.0	50	0	91.7	80 - 119	45.9	0.0709	20	
Surr: Toluene-d8	51.04	1.0	50	0	102	89 - 112	51.51	0.907	20	

ALS Houston, US

Date: 06-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: LHAAP Site 18/24
WorkOrder: HS19121036

QC BATCH REPORT

Batch ID: R352981 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MSD	Sample ID: HS19121036-01MSD	Units: UG/L			Analysis Date: 19-Dec-2019 16:56					
Client ID: C09_121719	Run ID: VOA6_352981	SeqNo: 5402195	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	18.56	1.0	20	0	92.8	78 - 124	18.81	1.32	20	
1,1,1-Trichloroethane	17.03	1.0	20	0	85.2	74 - 131	17.47	2.55	20	
1,1,2,2-Tetrachloroethane	20.22	1.0	20	0	101	71 - 121	19.54	3.42	20	
1,1,2-Trichloroethane	19.19	1.0	20	0	95.9	80 - 119	18.87	1.68	20	
1,1-Dichloroethane	17.21	1.0	20	0	86.0	77 - 125	18.12	5.17	20	
1,1-Dichloroethene	12.6	1.0	20	0	63.0	71 - 131	13.26	5.11	20	S
1,1-Dichloropropene	18.23	1.0	20	0	91.1	78 - 125	18.92	3.72	20	
1,2,3-Trichlorobenzene	23.7	1.0	20	0	119	69 - 129	22.05	7.24	20	
1,2,3-Trichloropropane	20.11	1.0	20	0	101	73 - 122	19.84	1.34	20	
1,2,4-Trichlorobenzene	20.64	1.0	20	0	103	69 - 130	20.8	0.749	20	
1,2,4-Trimethylbenzene	21.09	1.0	20	0	105	76 - 124	20.4	3.29	20	
1,2-Dibromo-3-chloropropane	20.58	1.0	20	0	103	62 - 128	18.75	9.32	20	
1,2-Dibromoethane	18.41	1.0	20	0	92.0	77 - 121	18.62	1.12	20	
1,2-Dichlorobenzene	19.56	1.0	20	0	97.8	80 - 119	18.95	3.16	20	
1,2-Dichloroethane	16.87	1.0	20	0	84.4	73 - 128	17.08	1.21	20	
1,2-Dichloropropane	17.96	1.0	20	0	89.8	78 - 122	18.72	4.14	20	
1,3,5-Trimethylbenzene	21.57	1.0	20	0	108	75 - 124	21.04	2.49	20	
1,3-Dichlorobenzene	20.38	1.0	20	0	102	80 - 119	19.41	4.88	20	
1,3-Dichloropropane	18.91	1.0	20	0	94.5	80 - 119	19.03	0.654	20	
1,4-Dichlorobenzene	20.07	1.0	20	0	100	79 - 118	19.16	4.66	20	
2,2-Dichloropropane	16.57	1.0	20	0	82.9	60 - 139	17.33	4.45	20	
2-Butanone	32.49	2.0	40	0	81.2	56 - 143	32.49	0.00115	20	
2-Chlorotoluene	22.06	1.0	20	0	110	79 - 122	21.44	2.88	20	
2-Hexanone	36.09	2.0	40	0	90.2	57 - 139	35.63	1.28	20	
4-Chlorotoluene	20.89	1.0	20	0	104	78 - 122	20.26	3.04	20	
4-Isopropyltoluene	21.38	1.0	20	0	107	77 - 127	20.61	3.69	20	
4-Methyl-2-pentanone	36.93	2.0	40	0	92.3	67 - 130	36.71	0.6	20	
Acetone	21.38	2.0	40	0	53.4	39 - 160	20.74	3.02	20	
Benzene	18.77	1.0	20	0	93.8	79 - 120	19.32	2.89	20	
Bromobenzene	20.24	1.0	20	0	101	80 - 120	19.97	1.33	20	
Bromochloromethane	17.02	1.0	20	0	85.1	78 - 123	17.11	0.56	20	
Bromodichloromethane	17.47	1.0	20	0	87.4	79 - 125	17.8	1.87	20	
Bromoform	17.64	1.0	20	0	88.2	66 - 130	17.79	0.833	20	
Bromomethane	7.464	1.0	20	0	37.3	53 - 141	8.471	12.6	20	S

ALS Houston, US

Date: 06-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: LHAAP Site 18/24
WorkOrder: HS19121036

QC BATCH REPORT

Batch ID: R352981 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MSD	Sample ID: HS19121036-01MSD	Units: UG/L			Analysis Date: 19-Dec-2019 16:56					
Client ID: C09_121719	Run ID: VOA6_352981	SeqNo: 5402195	PrepDate:	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	29.65	2.0	40	0	74.1	64 - 133	30.91	4.17	20	
Carbon tetrachloride	17.14	1.0	20	0	85.7	72 - 136	17.89	4.28	20	
Chlorobenzene	18.53	1.0	20	0	92.7	82 - 118	18.74	1.09	20	
Chloroethane	10.13	1.0	20	0	50.7	60 - 138	10.26	1.24	20	S
Chloroform	16.14	1.0	20	0	80.7	79 - 124	16.81	4.04	20	
Chloromethane	4.69	1.0	20	0	23.4	50 - 139	4.904	4.48	20	S
cis-1,2-Dichloroethene	17.81	1.0	20	0	89.0	78 - 123	18.25	2.46	20	
cis-1,3-Dichloropropene	18.14	1.0	20	0	90.7	75 - 124	18.68	2.96	20	
Dibromochloromethane	18.43	1.0	20	0	92.1	74 - 126	18.5	0.389	20	
Dibromomethane	17.38	1.0	20	0	86.9	79 - 123	17.5	0.658	20	
Dichlorodifluoromethane	2.234	1.0	20	0	11.2	32 - 152	2.343	4.77	20	S
Ethylbenzene	19.26	1.0	20	0	96.3	79 - 121	19.82	2.88	20	
Hexachlorobutadiene	19.05	1.0	20	0	95.2	66 - 134	21.08	10.2	20	
Isopropylbenzene	19.53	1.0	20	0	97.6	72 - 131	19.75	1.12	20	
m,p-Xylene	38.47	2.0	40	0	96.2	80 - 121	39.43	2.47	20	
Methylene chloride	16.32	2.0	20	0	81.6	74 - 124	16.71	2.39	20	
Naphthalene	21.18	1.0	20	0	106	61 - 128	18.98	11	20	
n-Butylbenzene	20.87	1.0	20	0	104	75 - 128	20.21	3.2	20	
n-Propylbenzene	21.64	1.0	20	0	108	76 - 126	21.15	2.28	20	
o-Xylene	19.02	1.0	20	0	95.1	78 - 122	19.38	1.9	20	
sec-Butylbenzene	21.58	1.0	20	0	108	77 - 126	20.87	3.3	20	
Styrene	18.73	1.0	20	0	93.6	78 - 123	19.01	1.49	20	
tert-Butylbenzene	21.6	1.0	20	0	108	78 - 124	20.94	3.11	20	
Tetrachloroethene	18.45	1.0	20	0	92.3	74 - 129	18.84	2.1	20	
Toluene	19.36	1.0	20	0	96.8	80 - 121	19.81	2.28	20	
trans-1,2-Dichloroethene	16.99	1.0	20	0	84.9	75 - 124	17.88	5.12	20	
trans-1,3-Dichloropropene	17.71	1.0	20	0	88.6	73 - 127	17.93	1.23	20	
Trichloroethene	18.6	1.0	20	0	93.0	79 - 123	19.97	7.11	20	
Trichlorofluoromethane	11.15	1.0	20	0	55.7	65 - 141	11.81	5.71	20	S
Vinyl chloride	6.862	1.0	20	0	34.3	58 - 137	7.34	6.73	20	S
Surr: 1,2-Dichloroethane-d4	45.04	1.0	50	0	90.1	81 - 118	46.32	2.8	20	
Surr: 4-Bromofluorobenzene	49.45	1.0	50	0	98.9	85 - 114	49.95	1	20	
Surr: Dibromofluoromethane	45.81	1.0	50	0	91.6	80 - 119	46.16	0.749	20	
Surr: Toluene-d8	50.59	1.0	50	0	101	89 - 112	50.34	0.509	20	

ALS Houston, US

Date: 06-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: LHAAP Site 18/24
WorkOrder: HS19121036

QC BATCH REPORT

Batch ID: R352981 (0)	Instrument: VOA6	Method: VOLATILES ORGANICS BY METHOD 8260C	
The following samples were analyzed in this batch:			
HS19121036-01	HS19121036-02	HS19121036-03	HS19121036-04
HS19121036-05	HS19121036-06	HS19121036-07	HS19121036-08
HS19121036-09			

ALS Houston, US

Date: 06-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: LHAAP Site 18/24
WorkOrder: HS19121036

**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 Quantitation 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	19-028-0	27-Mar-2020
California	2919, 2019-2020	30-Apr-2020
Dept of Defense	ANAB L2231	20-Dec-2021
Florida	E87611-28	30-Jun-2020
Illinois	2000322019-2	09-May-2020
Kansas	E-10352 2019-2020	31-Jul-2020
Kentucky	123043, 2019-2020	30-Apr-2020
Louisiana	03087, 2019-2020	30-Jun-2020
Maryland	343, 2019-2020	30-Jun-2020
North Dakota	R-193 2019-2020	30-Apr-2020
Oklahoma	2019-067	31-Aug-2020
Texas	TX104704231-19-23	30-Apr-2020

ALS Houston, US

Date: 06-Jan-20

Client: Bhate Environmental Associates, Inc.**Project:** LHAAP Site 18/24**Work Order:** HS19121036**SAMPLE TRACKING**

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS19121036-01	C09_121719	Login	12/18/2019 11:33:18 PM	NDR	MET018
HS19121036-01	C09_121719	Login	12/18/2019 11:33:18 PM	NDR	Sub
HS19121036-01	C09_121719	Login	12/18/2019 11:33:18 PM	NDR	EXT119
HS19121036-01	C09_121719	Login	12/18/2019 11:33:18 PM	NDR	VOA036

Sample Receipt Checklist

Client Name: Bhate Environmental
 Work Order: HS19121036

Date/Time Received: **18-Dec-2019 10:50**
 Received by: **JRM**

Checklist completed by: Nilesh D. Ranchod 18-Dec-2019
 eSignature Date

Reviewed by: Corey Grandits 19-Dec-2019
 eSignature Date

Matrices: **GW/Water**

Carrier name: **FedEx**

- 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 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):

2.0c U/C	IR11
----------	------

Cooler(s)/Kit(s):

45578

Date/Time sample(s) sent to storage:

12/18/19 11:55pm

- 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:

--



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 18/24

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	Sample Analysis Requested ⁽⁵⁾				Quality Assurance Samples ⁽⁶⁾			Cooler ID
								VOC	PERCHLORATE	TOTAL METALS	1, 4 - DIOXANE	Ambient Blank Lot Control Number	Equipment Blank Lot Control Number	Trip Blank Lot Control Number	
<u>18CPTMWO4-121719</u>	<u>17D4L2019</u>	<u>1325</u>	<u>-</u>	<u>N</u>	<u>WB</u>	<u>5</u>	<u>5</u>	<u>X</u>	<u>X</u>	<u>X</u>					
<u>TRIP BLANK</u>	<u>17D4L2019</u>		<u>-</u>	<u>TB</u>	<u>WB</u>	<u>2</u>	<u>2</u>	<u>X</u>							



HS19121036
 Bhate Environmental Associates, Inc.
 LHAAP Site 18/24

COMMENTS:

Custody Transfers Prior to Receipt by Laboratory				Sample Delivery Details / Laboratory Receipt			
Relinquished By (Signed)	Date	Time	Received by (signed)	Date	Time	Delivered Directly to Lab:	Shipped
<u>Scott Beesinger</u>	<u>12/17/19</u>	<u>1430</u>	<u>J. MAUMIN</u>	<u>12/18/19</u>	<u>10:50</u>	_____	_____
2. _____			3. _____			Method of Shipment: _____	
3. _____						Fed _____ Ex _____ Airbill _____	Number: _____
				Analytical Lab: <u>ALS 10450 Staneliff Rd. Suite 210 Houston, TX 77099 (281) 530-5656</u>			
				ATTN: <u>SONIA WEST</u> 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

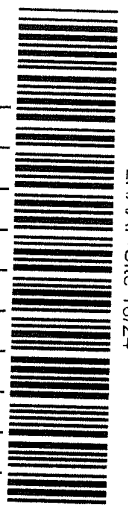


1608 13th Avenue South, Suite 300
Birmingham Alabama 35205
Tel: 205-918-4000
Fax: 205-918-4050

Chain of Custody and Analytical Request

Page: _____ of _____
Project/Phase No: NWO1312.0150
COC Number(1): _____
LIMS Number: _____

Facility/Base I.D.: <u>LHAAP</u>							Sample Analysis Requested ⁽⁶⁾				Quality Assurance Samples ⁽⁶⁾									
Project/Site Name: <u>LHAAP / Site 18/24</u>							Number of containers	VOC	PERCHLORATE	TOTAL METALS	1,4 - DIOXANE	Ambient Blank Lot Control Number	Equipment Blank Lot Control Number	Tr						
Client Name:																				
Collected by: <u>Scott Beesinger</u>							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⁾							
														<u>CO9-121719</u>	<u>17Dec2019</u>	<u>0800</u>	<u>-</u>	<u>N</u>	<u>WG</u>	<u>5</u>
							<u>CO9-121719-MS</u>	<u>17Dec2019</u>	<u>0800</u>	<u>-</u>	<u>MS</u>	<u>WG</u>	<u>5</u>	<u>X</u>	<u>X</u>	<u>X</u>				
							<u>CO9-121719-MSD</u>	<u>17Dec2019</u>	<u>0800</u>	<u>-</u>	<u>SD</u>	<u>WG</u>	<u>5</u>	<u>X</u>	<u>X</u>	<u>X</u>				
							<u>126-121719</u>	<u>17Dec2019</u>	<u>0900</u>	<u>-</u>	<u>N</u>	<u>WG</u>	<u>6</u>	<u>X</u>	<u>X</u>	<u>X</u>	<u>X</u>			
							<u>126-121719_a</u>	<u>17Dec2019</u>	<u>0900</u>	<u>-</u>	<u>FD</u>	<u>WG</u>	<u>6</u>	<u>X</u>	<u>X</u>	<u>X</u>	<u>X</u>			
							<u>MW18-121719</u>	<u>17Dec2019</u>	<u>1000</u>	<u>-</u>	<u>N</u>	<u>WG</u>	<u>4</u>	<u>X</u>	<u>X</u>					
							<u>MW18-121719-MS</u>	<u>17Dec2019</u>	<u>1000</u>	<u>-</u>	<u>MS</u>	<u>WG</u>	<u>4</u>	<u>X</u>	<u>X</u>					
							<u>MW18-121719-MSD</u>	<u>17Dec2019</u>	<u>1000</u>	<u>-</u>	<u>SD</u>	<u>WG</u>	<u>4</u>	<u>X</u>	<u>X</u>					
							<u>120-121719</u>	<u>17Dec2019</u>	<u>1055</u>	<u>-</u>	<u>N</u>	<u>WG</u>	<u>5</u>	<u>X</u>	<u>X</u>		<u>X</u>			
							<u>MW14-121719</u>	<u>17Dec2019</u>	<u>1140</u>	<u>-</u>	<u>N</u>	<u>WG</u>	<u>6</u>	<u>X</u>	<u>X</u>	<u>X</u>	<u>X</u>			
							<u>18CPTMWD4SW-121719</u>	<u>17Dec2019</u>	<u>1235</u>	<u>-</u>	<u>N</u>	<u>WG</u>	<u>6</u>	<u>X</u>	<u>X</u>	<u>X</u>	<u>X</u>			



Bhate Environmental Associates, Inc.
LHAAP Site 18/24


HS19121036

COMMENTS:


*Cocher 45578 1211
Temp 2.0 CF00*

Custody Transfers Prior to Receipt by Laboratory				Sample Delivery Details / Laboratory Receipt			
Relinquished By (Signed) <u>Scott Beesinger</u>	Date <u>12/17/19</u>	Time <u>1430</u>	Received by (signed) <u>J. Murray</u>	Date <u>12/18/19</u>	Time <u>10:50</u>	Delivered Directly to Lab: _____	Shipped _____
2. _____			2. _____			Method of Shipment: _____	No.: _____
3. _____			3. _____			Fed _____ Ex _____ Airbill _____	Number: _____
				Analytical Lab: <u>ALS 10450 Stancliff Rd. Suite 210 Houston, TX 77099 (281) 530-5656</u>			
				ATTN: SONIA WEST Lab Recipient: _____ Delivery Date/Time: _____			

1.) Chain of Custody Number = date collected + custody number (e.g. 09-02-1999-01)
 2.) Sample Type (SA) Codes: N = Normal Sample, TB = Trip Blank (-c) Sample, FD = Field Duplicate (-a) Samples, FR = Field Replicate (-b) Samples, EB = Equipment Blank (-d) Samples, MS = Matrix Spike, SD = Matrix Spike Duplicate, AB = Ambient Blank (-e)
 3.) Sample Number: Unique sample number collected from a particular location per day. (e.g. Groundwater sample collected from MW-1 on 10/10/99 = 01, if sampled again on 10/10/99 = 02, etc.)
 4.) Matrix Codes: GS = Soil Gas, WG = Groundwater, WS = Surface Water, SO = Soil, SE = Sediment, SL = Sludge, SS = Surface Soil Samples, WQ = Aqueous Blank Samples (trip, equipment, ambient, etc), SQ = Soil Blanks
 5.) Sample Analysis Requested: Analytical method requested and number of containers provided for each.
 6.) Quality assurance samples are assigned by date (ddmmyy) and the sample number associated with the sample (01, 02, etc) (e.g. Equipment blank collected in association with MW-1 on 10/10/99 will be designated 10109901 in the Equipment Blank Lot Control

 ALS 10450 Stancliff Rd., Suite 210 Houston, Texas 77099 Tel. +1 281 530 5656 Fax. +1 281 530 5887	CUSTODY SEAL		Seal Broken By: <i>SM</i>
	Date: <i>12/17/19</i>	Time: <i>11:30</i>	Date: <i>12/18/19</i>
	Name: <i>Scott Beisinger</i>		
	Company: <i>BH&T</i>		

45578 6102 8 1 330
 DEC 1 8 2019
 DEC 1 8 2019



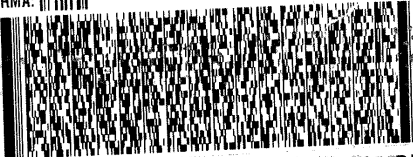
**Must Deliver Next Business Day
 Time and Temperature Sensitive!**

ORIGIN ID: SGRA (303) 597-2450
 SCOTT BEISINGER
 BH&T ENVIRONMENTAL ASSOCIATES
 1203-B EAST GRAND AVE.
 PMB202
 MARSHALL, TX 75670
 UNITED STATES US


SHIP DATE: 05DEC19
 ACTWT: 1.00 LB MAN
 CAD: 300130/CAFE3211
 DIMS: 19x16x13 IN

TO CLIENT SERVICES
 ALS LABORATORY GROUP
 10450 STANCLIFF ROAD
 SUITE 210
 HOUSTON TX 77099
 (281) 630-8866
 REF: LONGHORN-GW-RJ

RMA: ||| |||||



FedEx
 Express




FedEx
 TX# 1251 0292 6040
 (0223)

AB SGRA

WED - 18 DEC 10:30A
 PRIORITY OVERNIGHT

77099
 TX-US
 IAH



110 162795 27DEC19 66GA 56AC2/18DD/85A2



Case Narrative

Method: 6850

Analysis: Perchlorate

Analysis SOP: LC-MS-CLO4

ALS WO ID(s): 1935912; 1935913; 1935914;
1935915; 1936106

Client: ALS Laboratories (Houston, TX)

Matrix: Water

ELMS Batch (HBN): 2336 (254688)

General Set Information: There were sixteen field samples in these Work Orders. The samples were analyzed for perchlorate.

Method Summary: Each sample was prepared as noted below and analyzed using an Agilent 1100 LC/MSD system in select ion monitoring (SIM) mode at m/z 83 and 85, which corresponds to the loss of one oxygen atom from the perchlorate molecule. ChemStation software was used for instrument control and data analysis. The ion ratio of m/z 83 to 85 was used to positively identify the response peak as perchlorate. Quantitation was performed using the m/z 83 peak area. An internal standard (ISTD) of ^{18}O labeled perchlorate was added to each sample to establish the perchlorate peak retention time and used in quantitation.

Sample Preparation: A 10.0mL aliquot of each sample was transferred into a 15-mL centrifuge tube. 50 μL of an ^{18}O labeled perchlorate solution was added to each sample as an internal standard. The samples were then capped, vortexed, and filtered into autosampler vial using Phenex PES membrane 0.45 μm Syringe filters.

Holding Times: Holding times were met for all analyses.

Dilutions: Field samples 1935913001 and 1935915009 were analyzed and reported from 1:1,000 dilutions. Field sample 1935915010 was analyzed and reported from a 1:10,000 dilution. Field sample 1935915012 was analyzed and reported from a 1:10 dilution. The reporting limits have been adjusted accordingly.

Method QC data: The method blank (LMB 690689) was less than 1/2 the CRDL. The recovery for the LCS (690686) was within acceptable parameters.



MS/MSD Analysis: MS/MSD was performed on samples 1935915002/03 and 1935915007/08 (Client ID's: C09_121719 and MW18_121719). 3.0 μ L of Working Standard Solution Horizon ID 49947 was added to 10.0mL of sample preparation. The spike target was 3. μ g/L. The MS/MSD (1935912002/03) failed QC acceptance criteria for percent recoveries. The relative percent difference (RPD) passed acceptance criteria. The Matrix Spike and Matrix Spike duplicate is reported for the clients' information only. The sample matrix may be inappropriate for the method selected. The relative percent difference (RPD) failed acceptance criteria for MS/MSD 1935915007/08.

Instrument QC: Instrument initial and continuing calibrations were performed in accordance with published procedures.

NC/CAR(s): NA

Sample Calculation: Samples were reported in μ g/L. Results were calculated in μ g/L by the equation (A)x(B),

where: A = Analyte concentration from the standard curve (μ g/L)
B = Dilution performed at time of analysis

Miscellaneous Comments: These samples were analyzed in accordance with the requirements found in the DOD QSM Version 5.1.1. The Reporting Limit Verification Standard (RLVS – 690687) is reported from the analysis of the Laboratory Control Sample (LCS – 690686) at a level of 3.0 μ g/L. Due to limitations of the Chemstation Software, some of the chromatographic peaks may require manual integrations. A manual integration was performed for one of the Initial Calibration analyses (datafile: 20SEPI03).

Thomas Bosch January 06, 2020
Analyst Date



ANALYTICAL REPORT

Report Date: January 06, 2020

RJ Modashia
 ALS Environmental (Houston)
 10450 Stancliff Road
 Suite 210
 Houston, TX 77099

Phone: 281 530-5656

E-mail: RJ.Modashia@ALSGlobal.com

Workorder: **34-1935915**

Project ID: HS19121036

Purchase Order: HS19121036

Project Manager Kevin W. Griffiths

Client Sample ID	Lab ID	Collect Date	Receive Date	Sampling Site
C09_121719	1935915001	12/17/19	12/20/19	
126_121719	1935915004	12/17/19	12/20/19	
126_121719_a	1935915005	12/17/19	12/20/19	
MW18_121719	1935915006	12/17/19	12/20/19	
120_121719	1935915009	12/17/19	12/20/19	
MW14_121719	1935915010	12/17/19	12/20/19	
18CPTMW04SW_121719	1935915011	12/17/19	12/20/19	
18CPTMW04_121719	1935915012	12/17/19	12/20/19	

Client QC ID *	Lab ID	Collect Date	Receive Date	Sampling Site
C09_121719MS	1935915002	12/17/19	12/20/19	
C09_121719MSD	1935915003	12/17/19	12/20/19	
MW18_121719MS	1935915007	12/17/19	12/20/19	
MW18_121719MSD	1935915008	12/17/19	12/20/19	

*Client QC is reported as part of the Quality Control results report, if requested.



ANALYTICAL REPORT

Workorder: **34-1935915**Client: ALS Environmental
(Houston)

Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: C09_121719	Sampling Site: NA	Collected: 12/17/2019				
Lab ID: 1935915001	Media: 125 mL Nalgene	Received: 12/20/2019				
Matrix: Water	Sampling Parameter: NA					
Analysis Method - EPA 6850, DoD QSM						
Preparation: Not Applicable	Analysis: EPA 6850, DoD QSM Water Batch: ELMS/2336 (HBN: 254688) Analyzed: 01/02/2020 14:49	Instrument ID: LCMS04 %Solids: NA Report Basis: Wet				
Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	1.5	1.0	2.0	4.0	1	J

Sample ID: 126_121719	Sampling Site: NA	Collected: 12/17/2019				
Lab ID: 1935915004	Media: 125 mL Nalgene	Received: 12/20/2019				
Matrix: Water	Sampling Parameter: NA					
Analysis Method - EPA 6850, DoD QSM						
Preparation: Not Applicable	Analysis: EPA 6850, DoD QSM Water Batch: ELMS/2336 (HBN: 254688) Analyzed: 01/02/2020 15:31	Instrument ID: LCMS04 %Solids: NA Report Basis: Wet				
Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Sample ID: 126_121719_a	Sampling Site: NA	Collected: 12/17/2019				
Lab ID: 1935915005	Media: 125 mL Nalgene	Received: 12/20/2019				
Matrix: Water	Sampling Parameter: NA					
Analysis Method - EPA 6850, DoD QSM						
Preparation: Not Applicable	Analysis: EPA 6850, DoD QSM Water Batch: ELMS/2336 (HBN: 254688) Analyzed: 01/02/2020 15:45	Instrument ID: LCMS04 %Solids: NA Report Basis: Wet				
Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Sample ID: MW18_121719	Sampling Site: NA	Collected: 12/17/2019				
Lab ID: 1935915006	Media: 125 mL Nalgene	Received: 12/20/2019				
Matrix: Water	Sampling Parameter: NA					
Analysis Method - EPA 6850, DoD QSM						
Preparation: Not Applicable	Analysis: EPA 6850, DoD QSM Water Batch: ELMS/2336 (HBN: 254688) Analyzed: 01/02/2020 15:59	Instrument ID: LCMS04 %Solids: NA Report Basis: Wet				
Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U



ANALYTICAL REPORT

Workorder: **34-1935915**Client: ALS Environmental
(Houston)

Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: 120_121719	Sampling Site: NA	Collected: 12/17/2019				
Lab ID: 1935915009	Media: 125 mL Nalgene	Received: 12/20/2019				
Matrix: Water	Sampling Parameter: NA					
Analysis Method - EPA 6850, DoD QSM						
Preparation: Not Applicable	Analysis: EPA 6850, DoD QSM Water Batch: ELMS/2336 (HBN: 254688) Analyzed: 01/02/2020 16:54	Instrument ID: LCMS04 %Solids: NA Report Basis: Wet				
Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	23000	1000	2000	4000	1000	

Sample ID: MW14_121719	Sampling Site: NA	Collected: 12/17/2019				
Lab ID: 1935915010	Media: 125 mL Nalgene	Received: 12/20/2019				
Matrix: Water	Sampling Parameter: NA					
Analysis Method - EPA 6850, DoD QSM						
Preparation: Not Applicable	Analysis: EPA 6850, DoD QSM Water Batch: ELMS/2336 (HBN: 254688) Analyzed: 01/02/2020 17:08	Instrument ID: LCMS04 %Solids: NA Report Basis: Wet				
Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	130000	10000	20000	40000	10000	

Sample ID: 18CPTMW04SW_121719	Sampling Site: NA	Collected: 12/17/2019				
Lab ID: 1935915011	Media: 125 mL Nalgene	Received: 12/20/2019				
Matrix: Water	Sampling Parameter: NA					
Analysis Method - EPA 6850, DoD QSM						
Preparation: Not Applicable	Analysis: EPA 6850, DoD QSM Water Batch: ELMS/2336 (HBN: 254688) Analyzed: 01/02/2020 17:22	Instrument ID: LCMS04 %Solids: NA Report Basis: Wet				
Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	1.1	1.0	2.0	4.0	1	J

Sample ID: 18CPTMW04_121719	Sampling Site: NA	Collected: 12/17/2019				
Lab ID: 1935915012	Media: 125 mL Nalgene	Received: 12/20/2019				
Matrix: Water	Sampling Parameter: NA					
Analysis Method - EPA 6850, DoD QSM						
Preparation: Not Applicable	Analysis: EPA 6850, DoD QSM Water Batch: ELMS/2336 (HBN: 254688) Analyzed: 01/02/2020 18:04	Instrument ID: LCMS04 %Solids: NA Report Basis: Wet				
Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	520	10	20	40	10	



ANALYTICAL REPORT

Workorder: **34-1935915**Client: ALS Environmental
(Houston)

Project Manager: Kevin W. Griffiths

Comments

Quality Control: EPA 6850, DoD QSM - (HBN: 254688)

Field samples 1935913001 and 1935915009 were analyzed and reported from 1:1,000 dilutions. Field sample 1935915010 was analyzed and reported from a 1:10,000 dilution. Field sample 1935915012 was analyzed and reported from a 1:10 dilution. The reporting limits have been adjusted accordingly.

Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Method	Analyst	Peer Review
EPA 6850, DoD QSM	/S/ Thomas Bosch 01/03/2020 13:16	/S/ Stephen Brose 01/06/2020 10:58

Laboratory Contact Information

ALS Environmental
960 W Levoy Drive
Salt Lake City, Utah 84123

Phone: (801) 266-7700
Email: als.lt.lab@ALSGlobal.com
Web: www.alssl.com

General Lab Comments

The results provided in this report relate only to the items tested.
Samples were received in acceptable condition unless otherwise noted.
Samples have not been blank corrected unless otherwise noted.
This test report shall not be reproduced, except in full, without written approval of ALS.

ALS provides professional analytical services for all samples submitted. ALS is not in a position to interpret the data and assumes no responsibility for the quality of the samples submitted.

All quality control samples processed with the samples in this report yielded acceptable results unless otherwise noted.

ALS is accredited for specific fields of testing (scopes) in the following testing sectors. The quality system implemented at ALS conforms to accreditation requirements and is applied to all analytical testing performed by ALS. The following table lists testing sector, accreditation body, accreditation number and website. Please contact these accrediting bodies or your ALS project manager for the current scope of accreditation that applies to your analytical testing.

Testing Sector	Accreditation Body (Standard)	Certificate Number	Website
Environmental	PJLA (DoD ELAP)	L17-506	http://www.pjlabs.com
	PJLA (ISO 17025)	L17-507-R1	http://www.pjlabs.com
	Utah (TNI)	UT00953	http://lams.nelac-institute.org/search
	Iowa (TNI)	IA# 376	http://www.shl.uiowa.edu/labcert/idnr/
	Kansas	E-10416	http://www.kdheks.gov/envlab/disclaimer.html
Industrial Hygiene	AIHA (ISO 17025 & AIHA IHLAP)	101574	http://www.aihaaccreditedlabs.org
	DOECAP-AP	L18-606	http://www.pjlabs.com
	Washington	C596	https://ecology.wa.gov/Regulations-Permits/Permits-certifications/Laboratory-Accreditation
Dietary Supplements	PJLA (ISO 17025)	L17-507-R1	http://www.pjlabs.com



ANALYTICAL REPORT

Workorder: 34-1935915

Client: ALS Environmental
(Houston)

Project Manager: Kevin W. Griffiths

Result Symbol Definitions

MDL = Method Detection Limit, a statistical estimate of method/media/instrument sensitivity.

RL = Reporting Limit, a verified value of method/media/instrument sensitivity.

CRDL = Contract Required Detection Limit

Reg. Limit = Regulatory Limit.

ND = Not Detected, testing result not detected above the MDL or RL.

< Means this testing result is less than the numerical value.

** No result could be reported, see sample comments for details.

Qualifier Symbol Definitions

U = Qualifier indicates that the analyte was not detected above the MDL.

J = Qualifier Indicates that the analyte value is between the MDL and the RL. It is also used to indicate an estimated value for tentatively identified compounds in mass spectrometry where a 1:1 response is assumed.

B = Qualifier indicates that the analyte was detected in the blank.

E = Qualifier indicates that the analyte result exceeds calibration range.

P = Qualifier indicates that the RPD between the two columns is greater than 40%.



Quality Control Sample Batch Report

00958658

Analysis Information

Workorder: 1935915

Limits: Client SOW/Contract Specified
Basis: DoD QSM

Preparation: NA
Batch: NA
Prepared By: NA

Analysis: EPA 6850, DoD QSM
Batch: ELMS/2336 (HBN: 254688)
Analyzed By: Thomas Bosch

Blank

LMB: 690689 Analyzed: 01/02/2020 13:54 Units: ug/L			
Analyte	Result	MDL	RL
Perchlorate	ND	1	2.00

Laboratory Control Sample

LCS: 690686 Analyzed: 01/02/2020 13:26 Dilution: 1 Units: ug/L				
Analyte	Result	Target	% Rec	QC Limits
Perchlorate	3.19	3.00	106	78.8 123.8

Matrix Spike - Matrix Spike Duplicate

Sample: 1935915001 Analyzed: 01/02/2020 14:49 Dilution: 1 Units: ug/L		MS: 1935915002 Analyzed: 01/02/2020 15:03 Dilution: 1 Units: ug/L				MSD: 1935915003 Analyzed: 01/02/2020 15:17 Dilution: 1 Units: ug/L			
Analyte	Result	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits
Perchlorate	1.50	4.34	3	# 145	78.8 123.8	3.81	# 127	13	0.0 20.0
Sample: 1935915006 Analyzed: 01/02/2020 15:59 Dilution: 1 Units: ug/L		MS: 1935915007 Analyzed: 01/02/2020 16:27 Dilution: 1 Units: ug/L				MSD: 1935915008 Analyzed: 01/02/2020 16:41 Dilution: 1 Units: ug/L			
Analyte	Result	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits
Perchlorate	ND	2.46	3	81.9	78.8 123.8	3.35	112	# 30.7	0.0 20.0

Comments

Field samples 1935913001 and 1935915009 were analyzed and reported from 1:1,000 dilutions. Field sample 1935915010 was analyzed and reported from a 1:10,000 dilution. Field sample 1935915012 was analyzed and reported from a 1:10 dilution. The reporting limits have been adjusted accordingly.

QC Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Analyst	Peer Review
/S/ Thomas Bosch 01/06/2020 08:23	/S/ Stephen Brose 01/06/2020 10:58

Symbols and Definitions

- * - Analyte above reporting limit or outside of control limits
- ▲ - Sample result is greater than 4 times the spike added
- - Sample and Matrix Duplicate less than 5 times the reporting limit
- - Result is above the calibration range
- # - The Matrix Spike, Matrix Spike duplicate or Matrix Duplicate is reported for your information only. The sample matrix may be inappropriate for the method selected.

- RPD - Relative % Difference (Spike / Spike Duplicate)
- ND - Not Detected (U - Qualifier also flags analyte as not detected)
- NA - Not Applicable
- QC results are not adjusted for moisture correction, where applicable



W

10450 Stancliff Rd, Ste 210
Houston, TX 77099
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F: +1 281 530 5887
www.alsglobal.com

18698/#2

Subcontract Chain of Custody

SAMPLING STATE: Texas

COC ID: 12905

SUBCONTRACT TO:

ALS Laboratory Group
960 LeVoy Dr
Salt Lake City, UT 84123

1935915

Phone: +1 801 266 7700

CUSTOMER INFORMATION:

Company: ALS Houston
Contact: RJ Modashia
Address: 10450 Stancliff Rd, Ste 210
Phone: +1 281 530 5656
Email: RJ.Modashia@alsglobal.com
Alternate Contact: Jumoke M. Lawal
Email: jumoke.lawal@alsglobal.com

INVOICE INFORMATION:

Company: ALS Houston
Contact: Accounts Payable
Address: 10450 Stancliff Rd, Ste 210
Phone: +1 281 530 5656
Reference: HS19121036
TSR: Danielle Winnings

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	HS19121036-01	C09_121719	Groundwater	17 Dec 2019 08:00
	SUB_Perch-6850			03 Jan 2020
2.	HS19121036-02	126_121719	Groundwater	17 Dec 2019 09:00
	SUB_Perch-6850			03 Jan 2020
3.	HS19121036-03	126_121719_a	Groundwater	17 Dec 2019 09:00
	SUB_Perch-6850			03 Jan 2020
4.	HS19121036-04	MW18_121719	Groundwater	17 Dec 2019 10:00
	SUB_Perch-6850			03 Jan 2020
5.	HS19121036-05	120_121719	Groundwater	17 Dec 2019 10:55
	SUB_Perch-6850			03 Jan 2020
6.	HS19121036-06	MW14_121719	Groundwater	17 Dec 2019 11:40
	SUB_Perch-6850			03 Jan 2020
7.	HS19121036-07	18CPTMW04SW_121719	Groundwater	17 Dec 2019 12:35
	SUB_Perch-6850			03 Jan 2020
8.	HS19121036-08	18CPTMW04_121719	Groundwater	17 Dec 2019 13:25
	SUB_Perch-6850			03 Jan 2020



Subcontract Chain of Custody

SAMPLING STATE: Texas

COC ID: 12905

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

QC Level: DOD IV (DoD Data Package)

MS/MSW -01, 04

Relinquished By:

AK

Angela Cooks

Date/Time:

12.19.19 18:00

Received By:

Date/Time:

12.20.19 1006

Cooler ID(s):

Temperature(s):



ALS Environmental
CHAIN-OF-CUSTODY

00958661

Project / Job / Task: HS19121036		Split:	Workorder ID: 1935915	Level: ENV_LVL4		Requested Analysis																
Client: ALS Environmental (Houston)			Account: 8101		Type: 125Poly																	
Comments:							Preservatives					EPA 6850, DoD QSM										
							COOL															
							Containers															
							ID(s)		Count													
Item	Collect Date/Time	Sample ID	Lab ID	QC	Matrix	ID(s)	Count															
1	12/17/2019 08:00	C09_121719	1935915001		Water	A	1	A														
2	12/17/2019 08:00	C09_121719MS	1935915002	MS	Water	A	1	A														
3	12/17/2019 08:00	C09_121719MSD	1935915003	MSD	Water	A	1	A														
4	12/17/2019 09:00	126_121719	1935915004		Water	A	1	A														
5	12/17/2019 09:00	126_121719_a	1935915005		Water	A	1	A														
6	12/17/2019 10:00	MW18_121719	1935915006		Water	A	1	A														
7	12/17/2019 10:00	MW18_121719MS	1935915007	MS	Water	A	1	A														
8	12/17/2019 10:00	MW18_121719MSD	1935915008	MSD	Water	A	1	A														
9	12/17/2019 10:55	120_121719	1935915009		Water	A	1	A														
10	12/17/2019 11:40	MW14_121719	1935915010		Water	A	1	A														

ORIGINAL FIELD SAMPLE CHAIN-OF-CUSTODY				SAMPLE PREPARATION / ANALYSIS CHAIN-OF-CUSTODY			
				Sample Prep / Analysis for: _____		Lab Notebook No.: _____	
				Prepared / Analyzed by: _____		Date / Time: _____	
Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location	Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location
Warren, Julie	12/20/2019 10:06	ALS Sample Receiving	Sample Login				
<i>R-33.1</i>	01-02-20/10:30	<i>T. Bosch</i>	<i>Storage with analysis</i>				



ALS Environmental
CHAIN-OF-CUSTODY

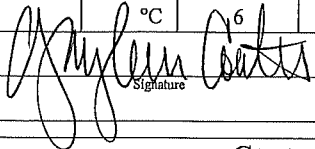
00958662

Project / Job / Task: HS19121036			Split:		Workorder ID: 1935915		Level: ENV_LVL4		Requested Analysis																								
Client: ALS Environmental (Houston)						Account: 8101		Type: 125Poly																									
Comments:						Preservatives		COOL														EPA 6650, DoD OCSM											
						Containers																											
Item	Collect Date/Time	Sample ID	Lab ID	QC	Matrix	ID(s)	Count																										
11	12/17/2019 12:35	18CPTMW04SW_121719	1935915011		Water	A	1	A																									
12	12/17/2019 13:25	18CPTMW04_121719	1935915012		Water	A	1	A																									
13																																	
14																																	
15																																	
16																																	
17																																	
18																																	
19																																	
20																																	

ORIGINAL FIELD SAMPLE CHAIN-OF-CUSTODY				SAMPLE PREPARATION / ANALYSIS CHAIN-OF-CUSTODY													
Relinquished By: (Signature)				Date / Time		Received By: (Signature)		Reason for Transfer / Storage Location		Sample Prep / Analysis for: _____				Lab Notebook No.: _____			
Prepared / Analyzed by: _____				Date / Time: _____		Relinquished By: (Signature)				Date / Time		Received By: (Signature)		Reason for Transfer / Storage Location			
Warath, Julie				12/20/2019 10:06		ALS Sample Receiving		Sample Login									
<i>Julie Warath</i>				12/24/19 1005		15C		storage									
B.33.1				01-22-20/1030		T. Bosch		cust analysis									

ALS-SALT LAKE CITY-RELATED INFORMATION REPORT (CRIR)

COOLER OR CONTAINER INFORMATION CHECKLIST (Fill In or Circle)

Client Name: <u>ALS HOUSTON</u>		Project/Task/Site: <u>1935915</u>							
Date/Time of Receipt: <u>12.20.19 1006</u>		Number of Coolers Received: <u>1</u>							
Condition of Coolers: <u>Acceptable/Unacceptable</u>		Temperature Control: <u>Present/Not Included</u>							
Cooler Custody Seals: <u>Present/Absent/NA</u>		Location Temp Taken: <u>Control/Between Samples</u>							
Container Custody Seals: <u>Present/Absent/NA</u>		Are all temperatures within project specific guidelines? <u>Yes/No/NA</u>							
Ice Present: <u>Yes/No/NA</u>		VOA Headspace Present? <u>Yes/No/NA</u>							
pH Check Performed:	Metals	Yes/No/NA	Total Phenolics	Yes/No/NA	NO3/NO2	Yes/No/NA			
	Cyanide	Yes/No/NA	TPH - 418.1	Yes/No/NA	Oil & Grease	Yes/No/NA			
	Sulfide	Yes/No/NA	COD	Yes/No/NA	Total Phosphorous	Yes/No/NA			
	Ammonia	Yes/No/NA	TKN	Yes/No/NA	Gross A.B, Gamma Spec	Yes/No/NA			
Cooler Received	Cooler Condition	Temp.	Cooler Received	Cooler Condition	Temp.	Cooler Received	Cooler Condition	Temp.	
1	<u>GOOD</u>	<u>3 °C</u>	4		°C	7		°C	
2		°C	5		°C	8		°C	
3		°C	6		°C	9		°C	
Taken By: <u></u>		Signature		<u>GAYLEEN COATES</u>		Printed Name		<u>12.20.19</u>	Date

CLIENT-RELATED INFORMATION

<input type="checkbox"/> Missing Cooler	<input type="checkbox"/> Missing Samples/Bottles	<input type="checkbox"/> Incorrect Preservation	<input type="checkbox"/> Insufficient Sample Volume
<input type="checkbox"/> Cooler Conditions	<input type="checkbox"/> Broken/Leaking Samples	<input type="checkbox"/> pH Criteria Not Met	<input type="checkbox"/> Chain of Custody Problems
<input type="checkbox"/> Missing Paperwork	<input type="checkbox"/> Incorrect Bottle Type	<input type="checkbox"/> Residual Chlorine Present	<input type="checkbox"/> Other:
<input type="checkbox"/> Missing/Incorrect Bottle Labels	<input type="checkbox"/> Cooler Temperatures Out of Range	<input type="checkbox"/> Head Space in Bottles	

BRIEFLY DESCRIBE THE PROBLEM AND THE ACTION TAKEN:

Client Notified? YES NO

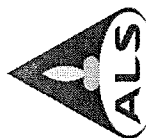
Response Required Within 24 Hours

PROJECT MANAGEMENT

PROJECT MANAGER COMMENTS:

ALS Project Manager: _____ Returned to Sample Receipt by: _____ Date: _____

Printed Name Signature



Batch Worklist

HBN: 254688

Instrument:

Created: 1/2/2020 13:05

Batch: ELMS/ 2336



Status: WP

Analyst: T. Bosch

Rule: EPA 6850, DoD QSM Water

- Workorder: 1935912 [ENV_LVL4]
- Workorder: 1935913 [ENV_LVL4]
- Workorder: 1935914 [ENV_LVL4]
- Workorder: 1935915 [ENV_LVL4]
- Workorder: 1936106 [ENV_LVL4]

Pos	Lab ID	Sample ID	Prep Initial	Prep Final	Dust Weight	Type	Mx	Container	Procedure	Mgr	Expire Date	Due Date	Run Date
1	690685	CCV for HBN 254688 [ELMS/2336]				CCV	3	E685041C3Q	E685041C3Q	5311	1/6/2020	1/6/2020	
2	690686	LCS for HBN 254688 [ELMS/2336]				LCS	3	E6850Q413Q	E6850Q413Q	5311	1/6/2020	1/6/2020	
3	690687	RLVS for HBN 254688 [ELMS/2336]				RLVS	3	E685041C3Q	E685041C3Q	5311	1/6/2020	1/6/2020	
4	690688	ICS for HBN 254688 [ELMS/2336]				ICS	3	E6850.D3Q	E6850.D3Q	5311	1/6/2020	1/6/2020	
5	690689	LMB for HBN 254688 [ELMS/2336]				LMB	3	E6850Q413Q	E6850Q413Q	5311	1/6/2020	1/6/2020	
6	1935912001	LH18/24-SP650_121719_BIX				SAMPLE	3	1935912001-A	E6850Q41.3	5480	1/14/2020	1/6/2020	
7	1935913001	LH18/24-SP140_121719				SAMPLE	3	1935913001-A	E6850Q41.3	5480	1/14/2020	1/6/2020	
8	1935914001	LH18/24-SP650_121719_BIX				SAMPLE	3	1935914001-A	E6850Q41.3	5480	1/14/2020	1/6/2020	
9	1935915001	C09_121719				SAMPLE	3	1935915001-A	E6850Q41.3	5480	1/14/2020	1/6/2020	
10	1935915002	C09_121719MS				MS	3	1935915002-A	E6850Q413Q	5480	1/6/2020	1/6/2020	
11	1935915003	C09_121719MSD				MSD	3	1935915003-A	E6850Q413Q	5480	1/6/2020	1/6/2020	
12	1935915004	126_121719				SAMPLE	3	1935915004-A	E6850Q41.3	5480	1/14/2020	1/6/2020	
13	1935915005	126_121719_a				SAMPLE	3	1935915005-A	E6850Q41.3	5480	1/14/2020	1/6/2020	
14	1935915006	MW18_121719				SAMPLE	3	1935915006-A	E6850Q41.3	5480	1/14/2020	1/6/2020	
15	690690	CCV for HBN 254688 [ELMS/2336]				CCV	3	E685041C3Q	E685041C3Q	5311	1/6/2020	1/6/2020	
16	1935915007	MW18_121719MS				MS	3	1935915007-A	E6850Q413Q	5480	1/6/2020	1/6/2020	
17	1935915008	MW18_121719MSD				MSD	3	1935915008-A	E6850Q413Q	5480	1/6/2020	1/6/2020	
18	1935915009	120_121719				SAMPLE	3	1935915009-A	E6850Q41.3	5480	1/14/2020	1/6/2020	
19	1935915010	MW14_121719				SAMPLE	3	1935915010-A	E6850Q41.3	5480	1/14/2020	1/6/2020	
20	1935915011	18CPTMW04SW_121719				SAMPLE	3	1935915011-A	E6850Q41.3	5480	1/14/2020	1/6/2020	
21	1935915012	18CPTMW04_121719				SAMPLE	3	1935915012-A	E6850Q41.3	5480	1/14/2020	1/6/2020	
22	1936106001	HS19121315-02				SAMPLE	3	1936106001-A	E6850Q41.3	5480	1/20/2020	1/8/2020	
23	690691	CCV for HBN 254688 [ELMS/2336]				CCV	3	E685041C3Q	E685041C3Q	5311	1/6/2020	1/6/2020	



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Analytical Documentation

Analyst Write-up

ALS Work Order #'s & Sample #()'s: 1935912 (001); 1935913 (001); 1935914 (001); 1935915 (001-12);
 1936106 (001) ELMS Batch/HBN ID: 2336 (254688)
 Prep Date: 01/02/2020 Analysis Date: 01/02/2020 Analyst: Tom Bosch
 Analyte: **Perchlorate** Matrix: **Water** Method: **6850**
 Sequence: \\HPCHEM\1\SEQUENCE\CLO4\2020\JAN\02JAN20D.s
 Reported DL: **1.0µg/L** Reported LOD: **2.0µg/L** Reported LOQ: **4.0µg/L**

SAMPLE PREPARATION/ANALYSIS:

Water: Samples were prepared by Tom Bosch. 10.0mL of each sample was pipetted into a 15-mL centrifuge tube, and 50µL of an oxygen-18 labeled perchlorate solution was added as an internal standard. The samples were capped, vortexed, and filtered with Phenex PES membrane 0.45µm Syringe filters prior to analysis.

REAGENTS: Eluent A1: 95% ASTM Type II water (ALS)/5%ACN (B&J Lot DU461-US)/0.1% glacial acetic acid (JT-Baker Lot 122550).
 Eluent B1: 95% ACN (B&J Lot DU461-US)/5% ASTM Type II water (ALS)/0.1% glacial acetic acid (JT-Baker Lot 122550).

STANDARDS: Internal Standard Spiking Solution Horizon# 47863. Dilutions of Working Standards (Horizon: 49947/48) used for ICAL, CCV's, RLVS and ICS.

CALIBRATION CURVE: Used curve from 09/20/2019, sequence 20SEP19D.s Offline Quantitation Method: CLO4-DP3.M

INSTRUMENT CONDITIONS: Samples were analyzed with an Agilent 1100 LC/MSD system, in negative SIM mode, monitoring m/z 83, 85, and 89.

Instrument ID: LCMS04 Online Acquisition Method: CLO4-AQN.M Fragmentor: 160 Output Gain: 8 Injection Volume: 35µL
 Column: KP-RPPX C8 separator, 250mm Mobile Phase: 70% Eluent A1; 30% Eluent B1 Run time: 12.0min.

FLOW GRADIENT:

Time (min.)	Flow (mL/min)
0	0.65
5.8	0.65
5.9	0.25
10.3	0.25
10.5	0.65
12.0	0.65

QC DATA: 3.0µL of QC Solution Horizon ID 47516 was used for LCS 690686; Target = 3.0µg/L. ASTM type II water was used for LMB 690689.

MS/MSD: The Matrix Spike and duplicate (MS/MSD) was performed on samples 1935915002/03 and 1935915007/08 (Client ID's: C09_121719 and MW18_121719). 3.0µL of Working Standard Solution Horizon ID 49947 was added to 10.0mL of sample preparation. Spike target = 3.0µg/L.

COMMENTS:

- 1) Results reported in µg/L. Field samples 1935913001 and 1935915009 were analyzed and reported from 1:1,000 dilutions. Field sample 1935915010 was analyzed and reported from a 1:10,000 dilution. Field sample 1935915012 was analyzed and reported from a 1:10 dilution. The reporting limits have been adjusted accordingly.
- 2) All QC, Blank, CCV, and MS/MSD results were within method parameters, except for the following. The MS/MSD (1935912002/03) failed QC acceptance criteria for percent recoveries. The relative percent difference (RPD) passed acceptance criteria. The Matrix Spike and Matrix Spike duplicate is reported for the clients' information only. The sample matrix may be inappropriate for the method selected. The relative percent difference (RPD) failed acceptance criteria for MS/MSD 1935915007/08.
- 3) Sample data can be viewed at two directories within the ALS system: \\ALSLTWS013\LCMS\LCMS04\2020\JAN\HBN# or through NuGenesis\Tree\PrintData\LCMS\DefaultView.
- 4) Notebook: \\alsltws013\ORGANIC\BOSCH\LCMS\Perchlorates\Waters\2020\DOD\254688-DoD-ALS-Hstn LCMS4 or through \\ALSLTWS013\DATAREVIEW\HBN#
- 5) The Reporting Limit Verification Standard (RLVS – 690687) is reported from the analysis of the Laboratory Control Sample (LCS – 690686) at a level of 3.0µg/L.
- 6) Due to limitations of the Chemstation Software, some of the chromatographic peaks require manual integration. Manual Integrations were performed for one of the Initial Calibration analyses (datafile: 20SEPI03).

5.5 Chromatography (GC, HPLC and LC/MS) Technical Review

Note: It is the peer reviewer's responsibility to ensure that appropriate criteria are used as defined in the HORIZON PROFILE. The evaluation criteria are prioritized as per Section 2.2 of this SOP. These items must be checked for all projects. The following checklist will be completed by both the analyst and the peer reviewer and scanned into the HBN folder with the raw data.

Chromatography (GC, HPLC, LC/MS) Technical Review Criteria	Analyst Initials	Reviewer Initials
Batch(es)/SDG: <u>ELMS: 2336 HBN: 254688</u> <u>1935915 / 1936106</u>		
Sample Set IDs if Applicable: <u>1935912 / 1935913 / 1935914</u>		
<u>Sample positions on autosampler verified against instrument sequence</u>	TB	NA
Calibration standards analyzed and meets criteria	TB	SB
Standards traceability checked and meets criteria	TB	SB
Standard curve coefficients evaluated and meet criteria	TB	SB
ICVs analyzed and meet acceptance criteria	TB	SB
CCVs analyzed and meet acceptance criteria	TB	SB
Retention Time Windows checked	TB	SB
For method 8081A, Endrin/DDT Breakdown is checked for compliance	—	—
Surrogate recoveries checked and appropriately addressed	—	—
Method Preparation Blanks analyzed and meet acceptance criteria	TB	SB
MSs, MSDs, and/or MDs analyzed and calculations checked; applicable	TB	SB
RLVS analyzed	TB	SB
Preparation and analysis hold times met	TB	SB
Preparation deviations and re-preparations noted when performed	TB	SB
Analysis deviations and re-analyses noted when performed	TB	SB
Sample dilution factors noted on reports	TB	SB
Electronic records in HBN transcription accuracy and completeness	TB	SB
Preparation and analysis calculations checked	TB	SB
NCRs are completed as necessary NC/CAR# _____	TB	SB
Report forms are complete and accurate	TB	SB
Manual integrations checked	TB	SB



STANDARD REPORT

Working Standard - CLO4ISTDWRK

CLO4ISTDWRK		Description - Perchlorate ISTD Wrk 1,000ug/L			
Standard: 49946		Created By: Thomas Bosch		Amount: 25 mL	
MFG: ALS/SLC		Create Date: 09/23/2019 03:09PM		Expires: 09/19/2020	
MFG Lot: TNB: 09/20/2019		Verified By: Thomas Bosch		Usable: Yes	
Pipette ID: Not Provided		Verify Date:		Lab Lot: CLO4ISTDWRK	
Pos.	Analyte	Name	Concentration		
1	14797-73-0-8385	Perchlorate 83:85 Ratio	1000 ug/L		
2	14797-73-0-89	Perchlorate 89	1000 ug/L		
Composition					
Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
47863	CLO4ISTDSTK	Perchlorate ISTD Stock	CLO4ISTDSTK	0.25 mL	12/05/2028



STANDARD REPORT

Constituent

Stock Standard - CLO4ISTDSTK

CLO4ISTDSTK		Description - Perchlorate ISTD Stock	
Standard: 47863	Created By: Thomas Bosch	Amount: 1 mL	
MFG: Cambridge Isotope	Create Date: 05/23/2019 10:05AM	Expires: 12/05/2028	
MFG Lot: SDIH-016	Verified By: Thomas Bosch	Usable: Yes	
Part ID: OLM-7310-S	Verify Date:	Lab Lot: CLO4ISTDSTK	
Pos.	Analyte	Name	Concentration
1	14797-73-0-8385	Perchlorate 83:85 Ratio	100 ug/mL
2	14797-73-0-89	Perchlorate 89	100 ug/mL



STANDARD REPORT

Working Standard - CLO4 WRK

CLO4 WRK		Description - 6850 WKG Std 100.ug/L			
Standard: 49948		Created By: Thomas Bosch		Amount: 10 mL	
MFG: ALS/SLC		Create Date: 09/20/2019 03:09PM		Expires: 07/25/2020	
MFG Lot: TNB: 09/20/2019				Usable: Yes	
Pipette ID: Not Provided				Lab Lot: CLO4 WRK	
Pos.	Analyte	Name	Concentration		
1	14797-73-0	Perchlorate	0.1 ug/mL		
2	14797-73-0-8385	Perchlorate 83:85 Ratio	0.1 ug/mL		
Composition					
Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
49947	CLO4 INT	6850 Intermdt AccStd 10.ug/mL	CLO4 INT	0.1 mL	07/25/2020



STANDARD REPORT

Constituent

Stock Standard - CLO4 STOCK

CLO4 STOCK		Description - 6850 Stock AccStd 1,000ug/mL	
Standard: 43659		Created By: Thomas Bosch	Amount: 100 mL
MFG: AccuStandard		Create Date: 09/17/2018 09:09AM	Expires: 07/25/2020
MFG Lot: 218065075			Usable: Yes
Part ID: IC-PER-10X-1			Lab Lot: CLO4 STOCK
Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	1000 ug/mL
2	14797-73-0-8385	Perchlorate 83:85 Ratio	1000 ug/mL



STANDARD REPORT

Constituent

Solvent Standard - ASTM H2O

ASTM H2O		Description - ASTM Type II Water	
Standard: 109	Created By: ALS Support (Lims)	Amount: 1000 L	
MFG: DCL In House	Create Date: 10/06/2005 09:10AM	Expires: 11/07/2025	
MFG Lot: Not Provided		Usable: Yes	
Part ID: Not Provided		Lab Lot: LAB 109	
Pos.	Analyte	Name	Concentration
Solvent - Analyte(s) not applicable			



STANDARD REPORT

Constituent

Working Standard - CLO4 INT

CLO4 INT		Description - 6850 Intermdt AccStd 10.ug/mL			
Standard: 49947		Created By: Thomas Bosch		Amount: 10 mL	
MFG: ALS/SLC		Create Date: 09/23/2019 03:09PM		Expires: 07/25/2020	
MFG Lot: TNB: 09/20/2019				Usable: Yes	
Pipette ID: Not Provided				Lab Lot: CLO4 INT	
Pos.	Analyte	Name	Concentration		
1	14797-73-0	Perchlorate	10 ug/mL		
2	14797-73-0-8385	Perchlorate 83:85 Ratio	10 ug/mL		
Composition					
Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
43659	CLO4 STOCK	6850 Stock AccStd 1,000ug/mL	CLO4 STOCK	0.1 mL	07/25/2020



STANDARD REPORT

Working Standard - CLO4 QC WRK

CLO4 QC WRK		Description - 6850 QC WKG STD 100ug/L			
Standard: 47516		Created By: Thomas Bosch		Amount: 10 mL	
MFG: ALS/SLC		Create Date: 05/06/2019 03:05PM		Expires: 03/31/2020	
MFG Lot: TNB: 05/06/2019				Usable: Yes	
Pipette ID: Not Provided		Lab Lot: CLO4 QC WRK 100.ug/L			
Pos.	Analyte	Name	Concentration		
1	14797-73-0	Perchlorate	100 ug/L		
Composition					
Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
47515	CLO4 QC INT	6850 QC Intrmdt Std-QC 10ug/mL	CLO4 QC INT 10.ug/mL	0.1 mL	03/31/2020



STANDARD REPORT

Constituent

Solvent Standard - ASTM H2O

ASTM H2O		Description - ASTM Type II Water	
Standard: 109		Created By: ALS Support (Lims)	Amount: 1000 L
MFG: DCL In House		Create Date: 10/06/2005 09:10AM	Expires: 11/07/2025
MFG Lot: Not Provided			Usable: Yes
Part ID: Not Provided			Lab Lot: LAB 109
Pos.	Analyte	Name	Concentration
Solvent - Analyte(s) not applicable			



STANDARD REPORT

Constituent

Stock Standard - CLO4 QCSTOCK

CLO4 QCSTOCK		Description - 6850 QC Stock STD 1,000ug/mL	
Standard: 36748		Created By: Thomas Bosch	Amount: 100 mL
MFG: Ultra Scientific		Create Date: 05/11/2017 01:05PM	Expires: 03/31/2020
MFG Lot: CP-0860			Usable: Yes
Part ID: ICC-013			Lab Lot: CLO4 QC STOCK
Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	1000 ug/mL



STANDARD REPORT

Constituent

Working Standard - CLO4 QC INT

CLO4 QC INT		Description - 6850 QC Intrmdt Std-QC 10ug/mL			
Standard: 47515		Created By: Thomas Bosch		Amount: 10 mL	
MFG: ALS/SLC		Create Date: 05/06/2019 03:05PM		Expires: 03/31/2020	
MFG Lot: TNB: 05/06/2019				Usable: Yes	
Pipette ID: Not Provided		Lab Lot: CLO4 QC INT 10.ug/mL			
Pos.	Analyte	Name	Concentration		
1	14797-73-0	Perchlorate	10 ug/mL		
Composition					
Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
36748	CLO4 QCSTOCK	6850 QC Stock STD 1,000ug/mL	CLO4 QC STOCK	0.1 mL	03/31/2020

125 Market Street
New Haven, CT 06513
USA



Tel (203)786-5290
Fax (203)786-5287
www.AccuStandard.com

CERTIFICATE OF ANALYSIS



AccuTrace™ Reference Standard

Catalog No: IC-PER-10X-1
Description: Perchlorate Standard
Element: Perchlorate (ClO₄)
SRM: Ind. Std.
Lot: 218065075
Matrix: Water
Hazards: Refer to SDS for complete safety information

Date Certified: Jun 25, 2018
Expiration: Jul 25, 2020
Sample Size: 100 mL
Components: 1
Storage Condition: Ambient (>5 °C)
Included on ISO/IEC 17025 Scope of Accreditation: Yes
Included on ISO 17034 Scope of Accreditation: Yes



Signal Word: None

Component	SRM #	Prepared Concentration (µg/mL)
ClO ₄ Perchlorate	Ind. Std.	1000

The gravimetric uncertainty for this product is ±0.24%.

The final solution was checked against an independent standard to verify its concentration.

We use the highest purity raw materials available to minimize impurity levels in the final solution. Typically 99.999%+ pure starting materials are used as well as ASTM Type I 18 megohm deionized water.

All solutions are filtered through a 0.2 µm filter prior to being bottled.

All glassware used in preparation is Class A and calibrated regularly.

All weights are traceable through NIST, Test No. 822-275872-11

All bottles are triple rinsed with deionized water prior to use.

Shake bottle prior to use and do not pipette directly out of the bottle. Use only cleaned Class A volumetric glassware.

We certify the accuracy of this standard to be ±0.5% of the stated value until its expiration date provided it is kept tightly capped and stored under the conditions stated above.

Certified By:

Meigan O'Leary, Inorganic QC Manager



Certificate of Analysis



ISO Guide 34 Reference Material

Product Number: ICC-013
Lot Number: CP-0860



Lot Issue Date: 29-Feb 2016
Expiration Date: 31-Mar 2020

Product Name: Perchlorate IC Standard

Description:

This Reference Material (RM) was gravimetrically prepared in accordance with ISO Guide 34 and under ULTRA Scientific's ISO 9001 registered quality system. The neat materials used for this product have been verified by ULTRA's ISO 17025 laboratory and under ULTRA's ISO Guide 34 accreditation. The analyte concentrations were verified by ULTRA's ISO 17025 accredited laboratory. For each analyte, the true value, with its uncertainty value calculated at the 95% confidence level, is reported below.

Analyte	Starting Material	Lot Number	Purity (%)	Calculated Value	True Value	Traceability & Method
perchlorate	potassium perchlorate	RM07987	100	1001 ± 5 µg/mL	976 ± 6 µg/mL	NIST SRM 3141A; ICP-OES

Solvent: water (low TOC, < 50 ppb)

Storage: Store at Room Temperature (15° to 30°C).

Traceability:

Traceability has been established through an unbroken chain of comparisons, each having stated uncertainties. Comparisons are based on appropriate physical or chemical measurements, including gravimetric or volumetric dilution, where the mass or volume of a solution before and after dilution is measured. The balances used for these measurements are calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1, ISO 9001, ISO 17025, and ISO Guide 34. Calibrated Class A glassware is used for volumetric measurements. Thermometers are calibrated against a NIST traceable thermometer in accordance with NIST Special Publication 819.

Estimation of Uncertainties:

The true value is reported, with its uncertainty value calculated at the 95% confidence level.

Homogeneity:

This RM was formulated and unitized according to an in-house procedure and is guaranteed to be homogeneous. There is no minimum sub-sample size required.

Intended Use:

This RM is intended for the preparation of working reference samples for use in routine laboratory analyses, calibration of instruments, validation of analytical methods, assessments of measurement methods and continuing calibration verification.

Instructions for Use:

Sample aliquots for analysis should be withdrawn at 20°C to 25°C immediately after opening and should be processed without delay for the true value to be valid within the stated uncertainties. Do not pipet from the bottle. Do not return any material removed for pipetting to the bottle. Tightly cap the bottle after removing any material and store according to the instructions noted above.

Hazards:

Refer to the Safety Data Sheet for information regarding this RM.

Expiration of Certification:

The certification of this RM is valid, within the measurement uncertainty specified, until the expiration date specified above, provided the RM is handled and stored in accordance with the instructions given in this certificate. This certification is nullified if the RM is damaged, contaminated, or otherwise modified.



ISO 9001 Registered Quality System – TUV USA

Page 1 of 2



Certificate of Analysis



ISO Guide 34 Reference Material

Product Number: ICC-013

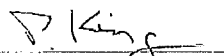
Lot Issue Date: 29-Feb 2016

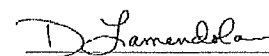
Lot Number: CP-0860

Expiration Date: 31-Mar 2020

Maintenance of Certification:

The real-time, long term stability of the RM may be monitored over the lifetime of the certification. If substantive changes occur that affect the certification before the expiration of this certificate, ULTRA Scientific will notify the purchaser.


Peter A. King, Ph.D.
VP, Technical Operations


Daniel J. Lamendola
Director of QA/RA



ISO 9001 Registered Quality System – TUV USA

Page 2 of 2



Product Name: PERCHLORIC ACID, SODIUM SALT
(Isotopic Label & Enrichment Specification) (18O4, 90%+) 100 UG/ML IN WATER

Lot Number: SDIH-016

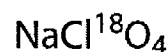
Catalog Number: OLM-7310-S

Product Information

Chemical Purity Specification: $\geq 98\%$

MW*: 130.44
* For isotopically labeled compounds, MW listed is for the fully enriched product.

Labeled CAS Number: NA



Unlabeled CAS Number: 7601-89-0

Chemical Formula: NaCl*O4

Storage: Store at room temperature away from light and moisture.

Stability: See storage and expiration date.

Certification

Cambridge Isotope Laboratories, Inc. guarantees that this material meets or exceeds the specifications stated. Absolute identity as well as chemical and isotopic purities are assured by the use of unambiguous synthetic routes and multiple chemical analyses whenever possible. Results are representative of QC testing at time of release from Quality Control unless otherwise stated. CIL Certificates of Analysis are occasionally updated with new data following recertification. We recommend checking the website for the latest version.

Volumetric measurements were made with Class A glassware. Gravimetry is traceable to the NIST through calibrated balances and certified, calibrated, standard weights. The calibrations are traceable to the NIST under Test No. 822/270236-04. The calibrations also meet specifications outlined in ISO 9001, ISO/IEC 17025, ANSI/NSCL Z540-1-1994, NCR Document 10CFR50 Appendix B, and applicable subdocuments.

This COA references the bulk catalog number before packaging. The COA also applies to the CIL finished good catalog number. Some possible packaging sizes and their corresponding suffix are -1.2, -1, -0.5, -10, or -0.1.

Approved by: Sashi Sivendran-Basak

Sashi Sivendran-Basak, Ph.D., Quality Review

Quality Control Tests and Results

QC Release Date	12/05/2018
Expiration Date	12/05/2028
Concentration Based on Gravimetry	100.0 \pm 1.0 $\mu\text{g/mL}$ (k=2)
Chemical Purity of Neat Material(s)	98%
LC/MS for Concentration	105.4 \pm 1.1 $\mu\text{g/mL}$ (k=2)



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Batch Review Method:

C:\HPCHEM\1\METHODS\CLO4-DP3.M

['#' ==> Run has not been reprocessed with Batch Review Method

['*' ==> Run has been saved with batch file]

#*	Sample	Location	Inj	SampleType	Run	Perchlorate Area	Perchlorate RT	Perchlorate Amount	
#*	690685	CCV@25	Vial 71	1	Control	1	1.55994e6	7.560	28.36838
#*	690686	QC@3.0	Vial 72	1	Control	2	1.77411e5	7.259	3.19399
#*	690688	ICS@3.0	Vial 73	1	Control	3	1.21919e5	7.244	2.98982
#*	690689	LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
#*	1935912001		Vial 75	1	Sample	5	1.13186e5	7.256	1.69696
#*	1935913001	1K	Vial 76	1	Sample	6	7.50336e5	7.600	13.85381 × 1,000.
#*	1935914001		Vial 77	1	Sample	7	1.16448e5	7.271	1.93064
#*	1935915001		Vial 78	1	Sample	8	6.26357e4	7.202	1.53061
#*	1935915002	MS	Vial 79	1	Sample	9	1.67718e5	7.194	4.34105
#*	1935915003	MSD	Vial 80	1	Sample	10	1.70226e5	7.204	3.80971
#*	1935915004		Vial 81	1	Sample	11	0.00000	0.000	0.00000
#*	1935915005		Vial 82	1	Sample	12	0.00000	0.000	0.00000
#*	1935915006		Vial 83	1	Sample	13	0.00000	0.000	0.00000
#*	690690	CCV@25	Vial 71	1	Control	14	1.55697e6	7.430	25.18198
#*	1935915007	MS	Vial 84	1	Sample	15	1.31015e5	7.176	2.45647
#*	1935915008	MSD	Vial 85	1	Sample	16	1.32260e5	7.185	3.34662
#*	1935915009	1K	Vial 86	1	Sample	17	1.32009e6	7.615	2.26282e4
#*	1935915010	10K	Vial 87	1	Sample	18	7.68865e5	7.605	1.30447e5
#*	1935915011		Vial 88	1	Sample	19	7.20051e4	7.345	1.12833
#*	1936106001		Vial 90	1	Sample	21	3.75684e5	7.220	6.65265
#*	1935915012	10X	Vial 91	1	Sample	22	3.40719e6	7.485	516.14517
*	690691	CCV@25	Vial 71	1	Control	23	1.84092e6	7.431	26.50237

#*	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount	
#*	690685	CCV@25	Vial 71	1	Control	1	1.85309e5	7.581	5.00000
#*	690686	QC@3.0	Vial 72	1	Control	2	2.04529e5	7.274	5.00000
#*	690688	ICS@3.0	Vial 73	1	Control	3	1.50034e5	7.270	5.00000
#*	690689	LMB	Vial 74	1	Control	4	1.97614e5	7.421	5.00000
#*	1935912001		Vial 75	1	Sample	5	2.41857e5	7.281	5.00000
#*	1935913001	1K	Vial 76	1	Sample	6	1.93760e5	7.618	5.00000
#*	1935914001		Vial 77	1	Sample	7	2.19726e5	7.292	5.00000
#*	1935915001		Vial 78	1	Sample	8	1.47744e5	7.212	5.00000
#*	1935915002	MS	Vial 79	1	Sample	9	1.42468e5	7.219	5.00000
#*	1935915003	MSD	Vial 80	1	Sample	10	1.64739e5	7.223	5.00000
#*	1935915004		Vial 81	1	Sample	11	8.26190e4	7.086	5.00000
#*	1935915005		Vial 82	1	Sample	12	8.16375e4	7.053	5.00000
#*	1935915006		Vial 83	1	Sample	13	1.75700e5	7.224	5.00000
#*	690690	CCV@25	Vial 71	1	Control	14	2.11105e5	7.446	5.00000
#*	1935915007	MS	Vial 84	1	Sample	15	1.95563e5	7.198	5.00000
#*	1935915008	MSD	Vial 85	1	Sample	16	1.45588e5	7.205	5.00000
#*	1935915009	1K	Vial 86	1	Sample	17	2.01300e5	7.637	5000.00000
#*	1935915010	10K	Vial 87	1	Sample	18	2.11546e5	7.628	5.00000e4
#*	1935915011		Vial 88	1	Sample	19	2.26624e5	7.350	5.00000
#*	1936106001		Vial 90	1	Sample	21	2.07387e5	7.238	5.00000
#*	1935915012	10X	Vial 91	1	Sample	22	2.02952e5	7.505	50.00000
*	690691	CCV@25	Vial 71	1	Control	23	2.35883e5	7.456	5.00000

#*	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount	
#*	690685	CCV@25	Vial 71	1	Control	1	4.57213e5	7.577	27.40050
#*	690686	QC@3.0	Vial 72	1	Control	2	5.95825e4	7.268	3.42868
#*	690688	ICS@3.0	Vial 73	1	Control	3	4.72946e4	7.260	3.71890
#*	690689	LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
#*	1935912001		Vial 75	1	Sample	5	4.05294e4	7.272	1.91502
#*	1935913001	1K	Vial 76	1	Sample	6	2.24222e5	7.618	13.51424
#*	1935914001		Vial 77	1	Sample	7	4.06777e4	7.281	2.13096
#*	1935915001		Vial 78	1	Sample	8	2.50802e4	7.216	1.94184

Batch Report: C:\HPCHEM\1\DATA\02JAN20D\02JAN20S.B

#*	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CL04-85 RT	CLO4-85 Amount	
#*	1935915002	MS	Vial 79	1	Sample	9	6.04977e4	7.206	5.03782
#*	1935915003	MSD	Vial 80	1	Sample	10	6.53036e4	7.210	4.69891
#*	1935915004		Vial 81	1	Sample	11	0.00000	0.000	0.00000
#*	1935915005		Vial 82	1	Sample	12	0.00000	0.000	0.00000
#*	1935915006		Vial 83	1	Sample	13	0.00000	0.000	0.00000
#*	690690	CCV@25	Vial 71	1	Control	14	4.73141e5	7.448	25.10439
#*	1935915007	MS	Vial 84	1	Sample	15	4.35554e4	7.182	2.59201
#*	1935915008	MSD	Vial 85	1	Sample	16	4.64932e4	7.193	3.76884
#*	1935915009	1K	Vial 86	1	Sample	17	3.97734e5	7.628	2.23585e4
#*	1935915010	10K	Vial 87	1	Sample	18	2.35180e5	7.624	1.30045e5
#*	1935915011		Vial 88	1	Sample	19	2.59057e4	7.372	1.25727
#*	1936106001		Vial 90	1	Sample	21	1.25368e5	7.239	7.17456
#*	1935915012	10X	Vial 91	1	Sample	22	9.99390e5	7.502	502.85057
*	690691	CCV@25	Vial 71	1	Control	23	5.41119e5	7.448	25.64372

*** End of Report ***

Sequence Table:

Method and Injection Info Part:

Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
====	=====	=====	=====	===	=====	=====	=====
1	Vial 71	690685	CCV@25	CLO4-AQN 1	Ctrl Samp		
2	Vial 72	690686	QC@3.0	CLO4-AQN 1	Ctrl Samp		
3	Vial 73	690688	ICS@3.0	CLO4-AQN 1	Ctrl Samp		
4	Vial 74	690689	LMB	CLO4-AQN 1	Ctrl Samp		
5	Vial 75	1935912001		CLO4-AQN 1	Sample		
6	Vial 76	1935913001	1K	CLO4-AQN 1	Sample		
7	Vial 77	1935914001		CLO4-AQN 1	Sample		
8	Vial 78	1935915001		CLO4-AQN 1	Sample		
9	Vial 79	1935915002	MS	CLO4-AQN 1	Sample		
10	Vial 80	1935915003	MSD	CLO4-AQN 1	Sample		
11	Vial 81	1935915004		CLO4-AQN 1	Sample		
12	Vial 82	1935915005		CLO4-AQN 1	Sample		
13	Vial 83	1935915006		CLO4-AQN 1	Sample		
14	Vial 71	690690	CCV@25	CLO4-AQN 1	Ctrl Samp		
15	Vial 84	1935915007	MS	CLO4-AQN 1	Sample		
16	Vial 85	1935915008	MSD	CLO4-AQN 1	Sample		
17	Vial 86	1935915009	1K	CLO4-AQN 1	Sample		
18	Vial 87	1935915010	10K	CLO4-AQN 1	Sample		
19	Vial 88	1935915011		CLO4-AQN 1	Sample		
20	Vial 89	1935915012	100	CLO4-AQN 1	Sample		
21	Vial 90	1936106001		CLO4-AQN 1	Sample		
22	Vial 91	1935915012	10X	CLO4-AQN 1	Sample		
23	Vial 71	690691	CCV@25	CLO4-AQN 1	Ctrl Samp		

Data file: C:\HPCHEM\1\DATA\02JAN20D\02JAND01.D

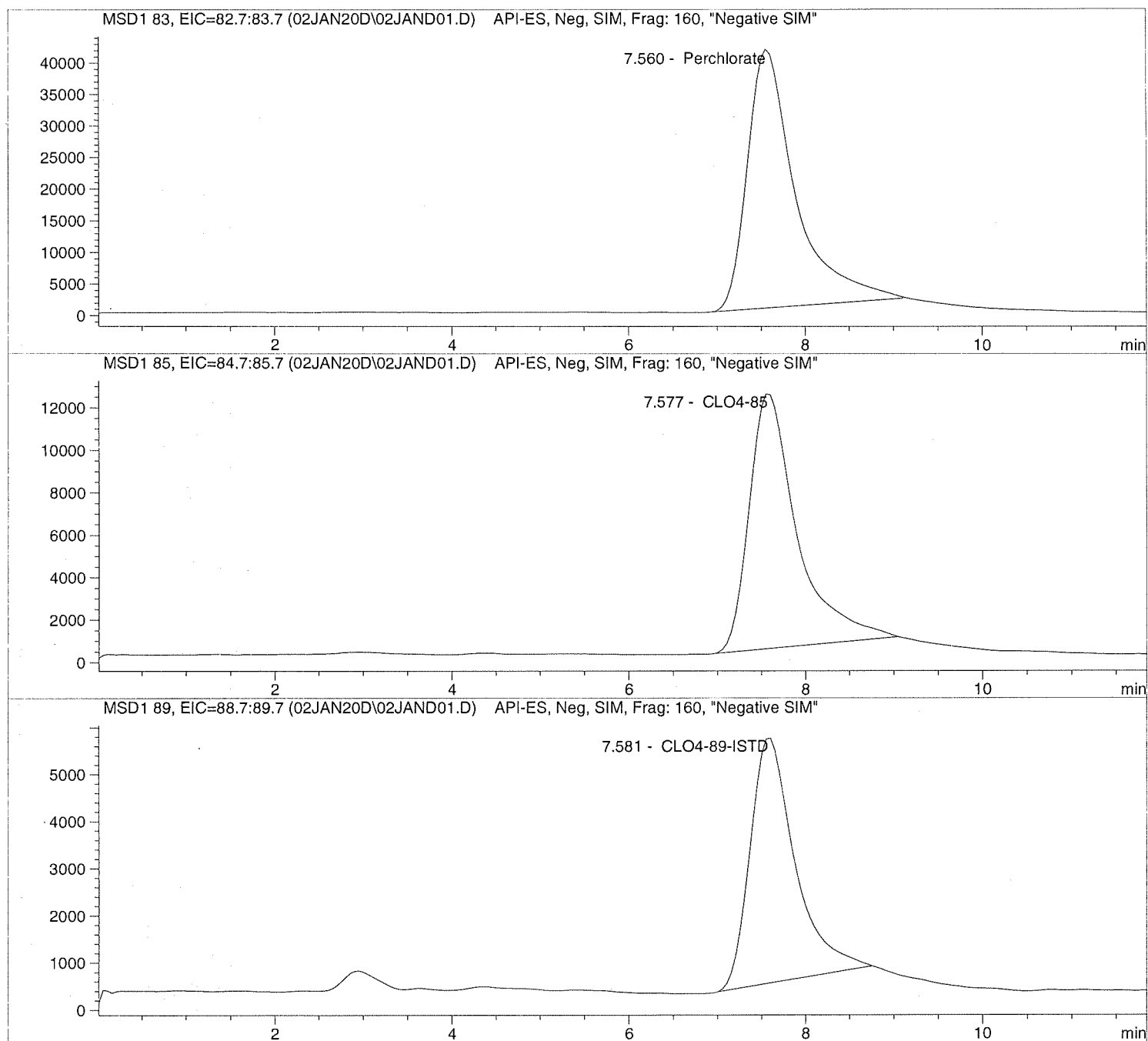
Sample Name: 690685 CCV@25

Injection Date: 1/02/2020 13:11:53
Sample Name: 690685 CCV@25
Acq Operator: TNB

Seq Line: 1
Location: Vial 71
Inj. No.: 1
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\02JAN20D\02JAND01.D Sample Name: 690685 CCV@25

```

=====
Injection Date: 1/02/2020 13:11:53 Seq Line: 1
Sample Name: 690685 CCV@25 Location: Vial 71
Acq Operator: TNB Inj. No.: 1
Inj. Vol.: 35 µl
=====

```

```

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By: Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 25.000

```

```

=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.560	PBA	1559941.9	28.3684	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.577	PBA	457213.1	27.4005	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.581	PBA	185309.1	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***

```


Data file: C:\HPCHEM\1\DATA\02JAN20D\02JAND02.D

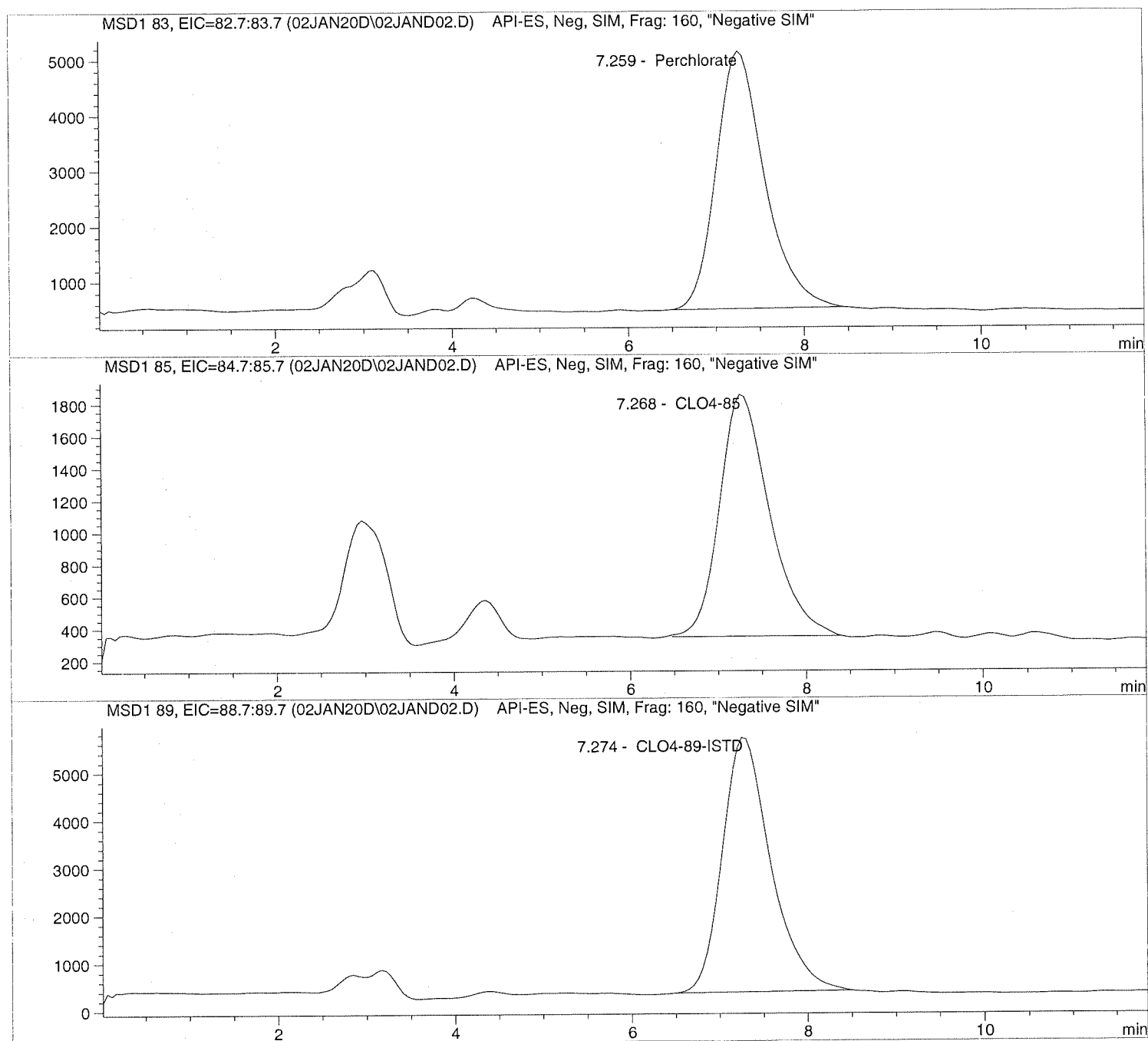
Sample Name: 690686 QC@3.0

=====
Injection Date: 1/02/2020 13:26:12
Sample Name: 690686 QC@3.0
Acq Operator: TNB

=====
Seq Line: 2
Location: Vial 72
Inj. No.: 1
Inj. Vol.: 35 μ l

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\02JAN20D\02JAND02.D Sample Name: 690686 QC@3.0

```

=====
Injection Date: 1/02/2020 13:26:12      Seq Line:      2
Sample Name:   690686 QC@3.0           Location:      Vial 72
Acq Operator:  TNB                     Inj. No.:     1
                                           Inj. Vol.:    35 µl
=====

```

```

Acq. Method:   CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:  11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:    1.000000
Dilution:      1.000000
Sample Amount: 3.000
=====

```

```

=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.259	BBA	177410.8	3.1940	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.268	BBA	59582.5	3.4287	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.274	BBA	204529.1	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

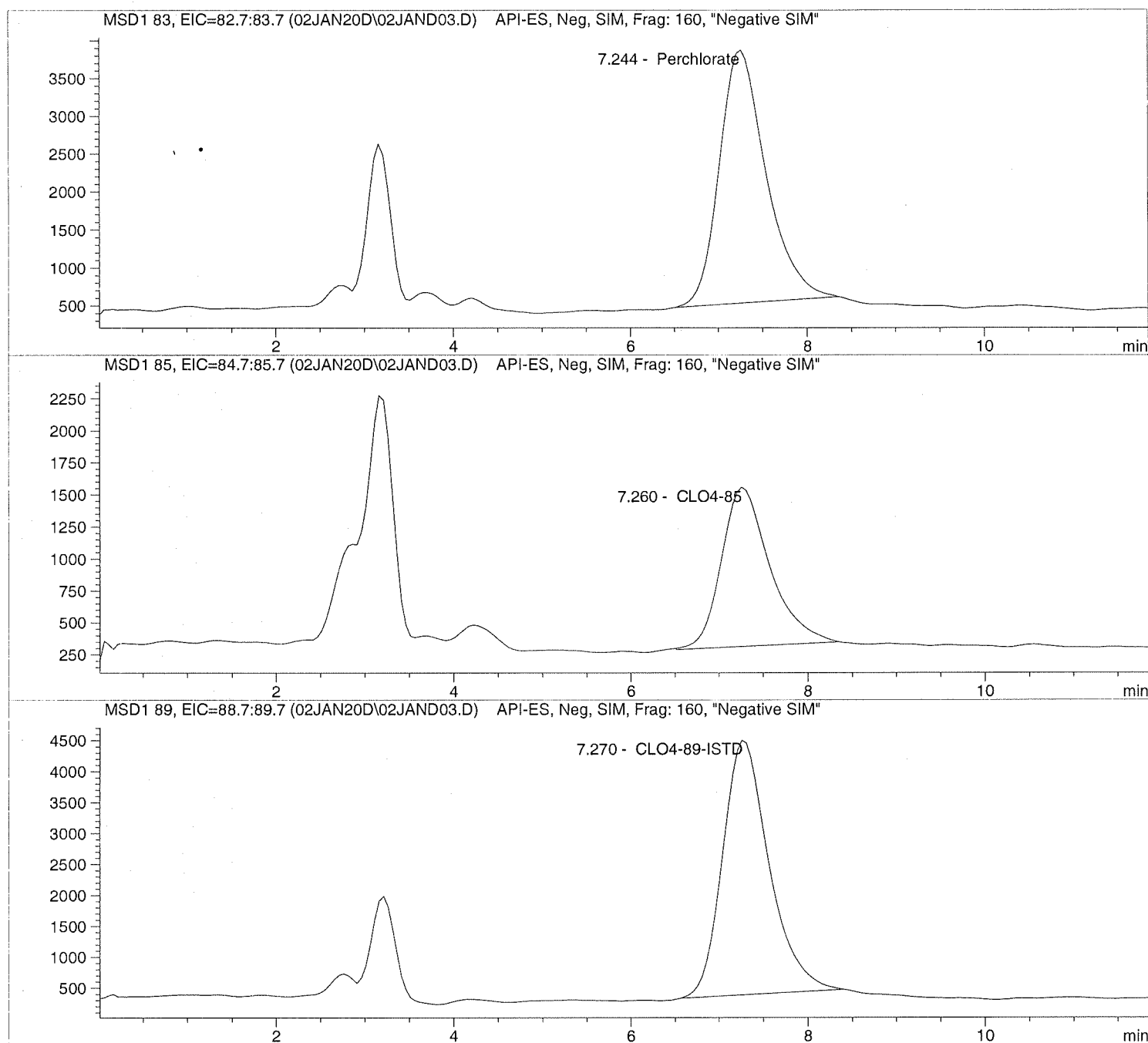
```

Data file: C:\HPCHEM\1\DATA\02JAN20D\02JAND03.D Sample Name: 690688 ICS@3.0

```
=====
Injection Date: 1/02/2020 13:40:06      Seq Line:          3
Sample Name:    690688 ICS@3.0          Location:          Vial 73
Acq Operator:   TNB                      Inj. No.:         1
                                           Inj. Vol.:       35 µl
=====
```

```
Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   11/5/2019 08:44:45
=====
```

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\02JAN20D\02JAND03.D Sample Name: 690688 ICS@3.0

```

=====
Injection Date: 1/02/2020 13:40:06      Seq Line: 3
Sample Name: 690688 ICS@3.0            Location: Vial 73
Acq Operator: TNB                      Inj. No.: 1
                                           Inj. Vol.: 35 µl
=====

```

```

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By: Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 3.000
=====

```

```

=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.244	BBA	121919.3	2.9898	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.260	BBA	47294.6	3.7189	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.270	PBA	150034.3	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\02JAN20D\02JAND04.D

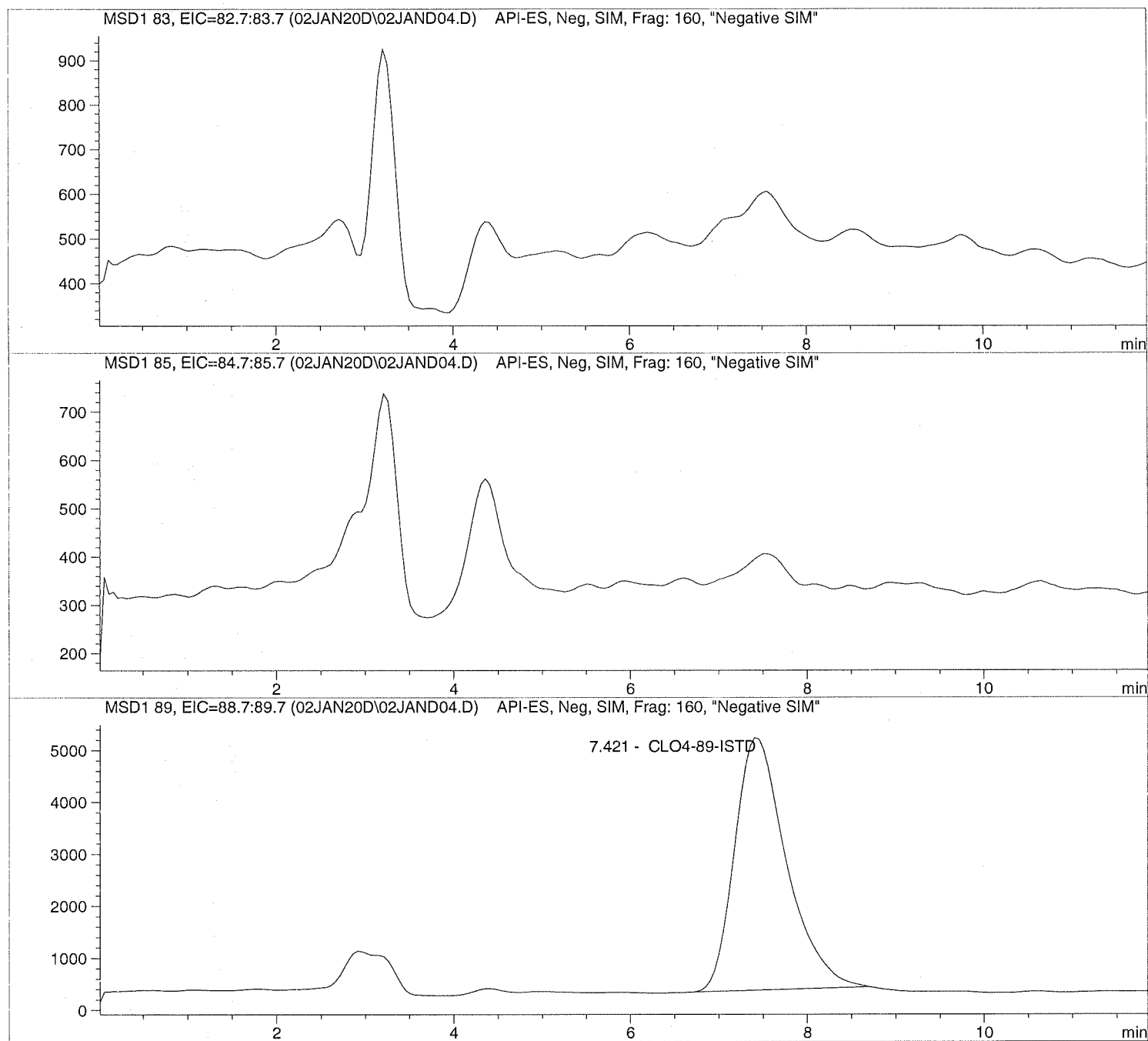
Sample Name: 690689 LMB

=====
Injection Date: 1/02/2020 13:54:01
Sample Name: 690689 LMB
Acq Operator: TNB

Seq Line: 4
Location: Vial 74
Inj. No.: 1
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\02JAN20D\02JAND04.D Sample Name: 690689 LMB

```

=====
Injection Date: 1/02/2020 13:54:01      Seq Line:          4
Sample Name:    690689 LMB              Location:          Vial 74
Acq Operator:   TNB                     Inj. No.:         1
                                           Inj. Vol.:        35 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  0.000
=====

```

```

=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.421	PBA	197614.4	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\02JAN20D\02JAND05.D

Sample Name: 1935912001

Injection Date: 1/02/2020 14:07:55

Seq Line: 5

Sample Name: 1935912001

Location: Vial 75

Acq Operator: TNB

Inj. No.: 1

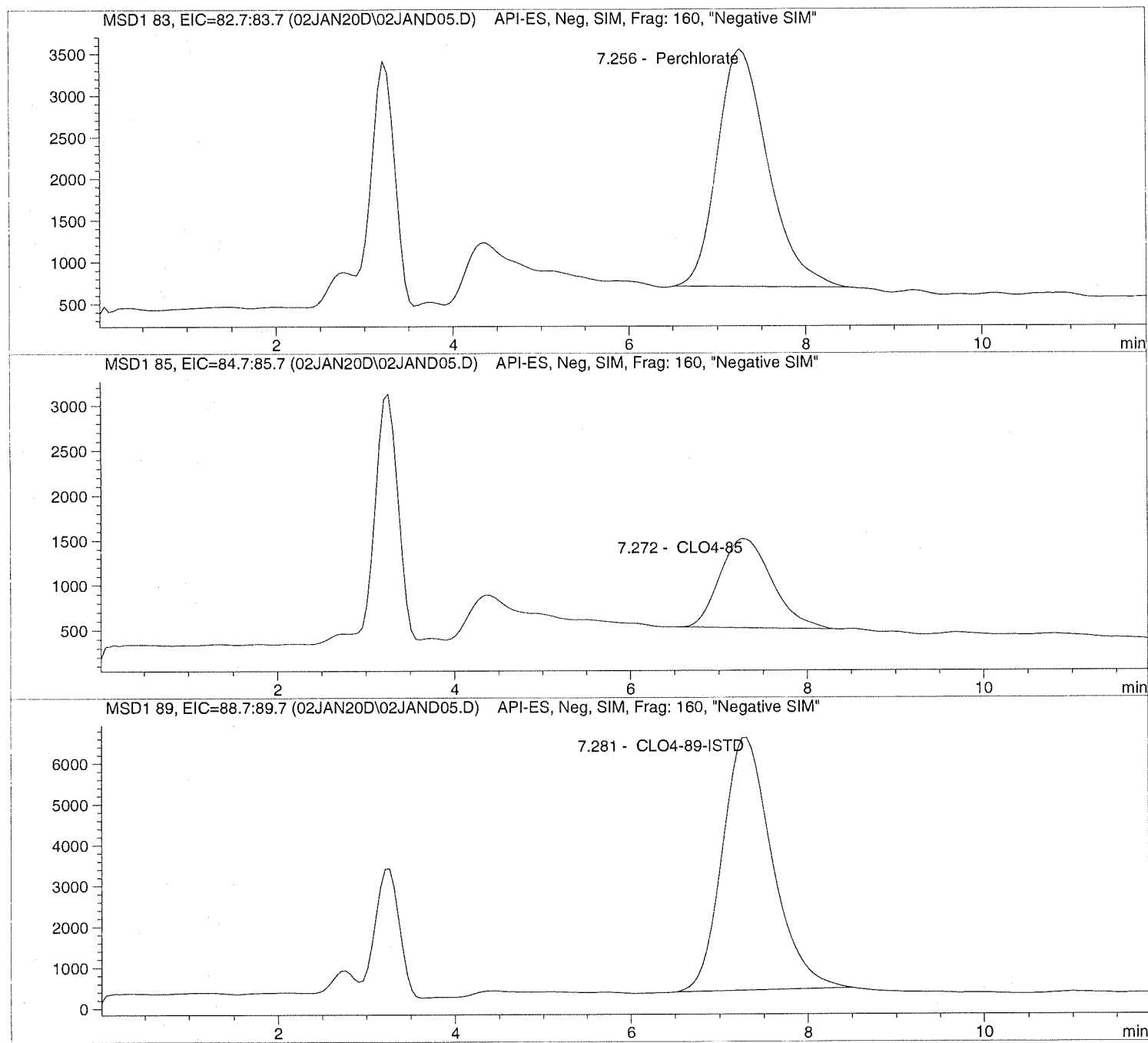
Inj. Vol.: 35 μ l

Acq. Method: CLO4-AQN.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M

Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\02JAN20D\02JAND05.D

Sample Name: 1935912001

```

=====
Injection Date: 1/02/2020 14:07:55      Seq Line:      5
Sample Name:    1935912001              Location:      Vial 75
Acq Operator:   TNB                     Inj. No.:     1
                                           Inj. Vol.:    35 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  0.000
=====

```

```

=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.256	PBA	113185.7	1.6970	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.272	PBA	40529.4	1.9150	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.281	PBA	241856.7	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

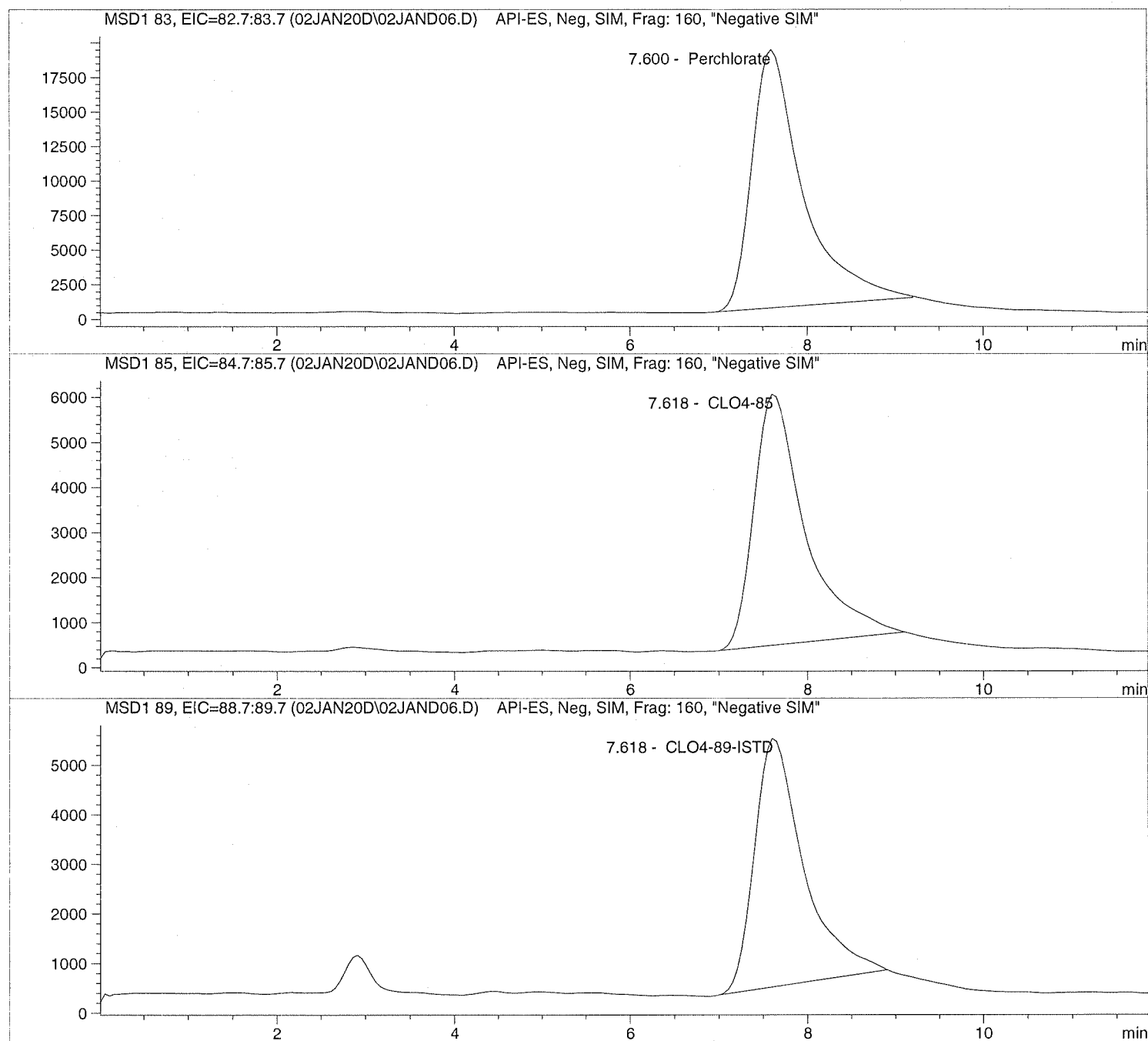
```


Data file: C:\HPCHEM\1\DATA\02JAN20D\02JAND06.D Sample Name: 1935913001 1K

```
=====
Injection Date: 1/02/2020 14:21:57      Seq Line: 6
Sample Name: 1935913001 1K              Location: Vial 76
Acq Operator: TNB                        Inj. No.: 1
                                           Inj. Vol.: 35 µl
=====
```

```
Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45
```

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\02JAN20D\02JAND06.D Sample Name: 1935913001 1K

```

=====
Injection Date: 1/02/2020 14:21:57      Seq Line: 6
Sample Name: 1935913001 1K              Location: Vial 76
Acq Operator: TNB                        Inj. No.: 1
                                           Inj. Vol.: 35 µl
=====

```

```

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By: Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 0.000
=====

```

```

=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.600	PBA	750336.3	13.8538	Perchlorate <i>x 1,000. DILUTION</i>

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.618	PBA	224222.5	13.5142	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.618	PBA	193759.9	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\02JAN20D\02JAND07.D

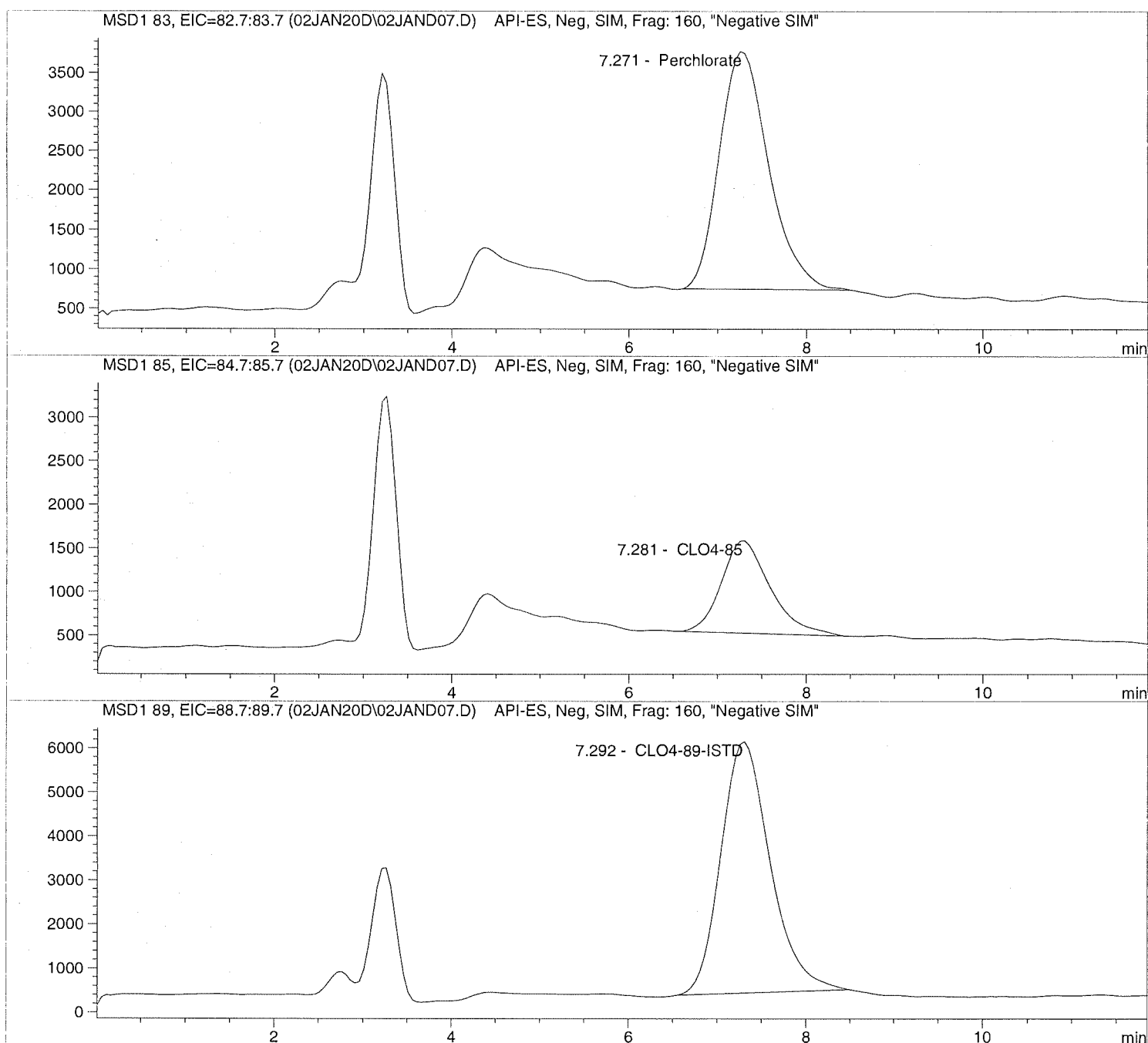
Sample Name: 1935914001

=====
Injection Date: 1/02/2020 14:35:49
Sample Name: 1935914001
Acq Operator: TNB

Seq Line: 7
Location: Vial 77
Inj. No.: 1
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\02JAN20D\02JAND07.D Sample Name: 1935914001

```

=====
Injection Date: 1/02/2020 14:35:49      Seq Line: 7
Sample Name: 1935914001                Location: Vial 77
Acq Operator: TNB                       Inj. No.: 1
                                           Inj. Vol.: 35 µl

```

```

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By: Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 0.000

```

```

=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.271	PBA	116448.2	1.9306	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.281	PBA	40677.7	2.1310	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.292	PBA	219725.9	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***

```

Data file: C:\HPCHEM\1\DATA\02JAN20D\02JAND08.D

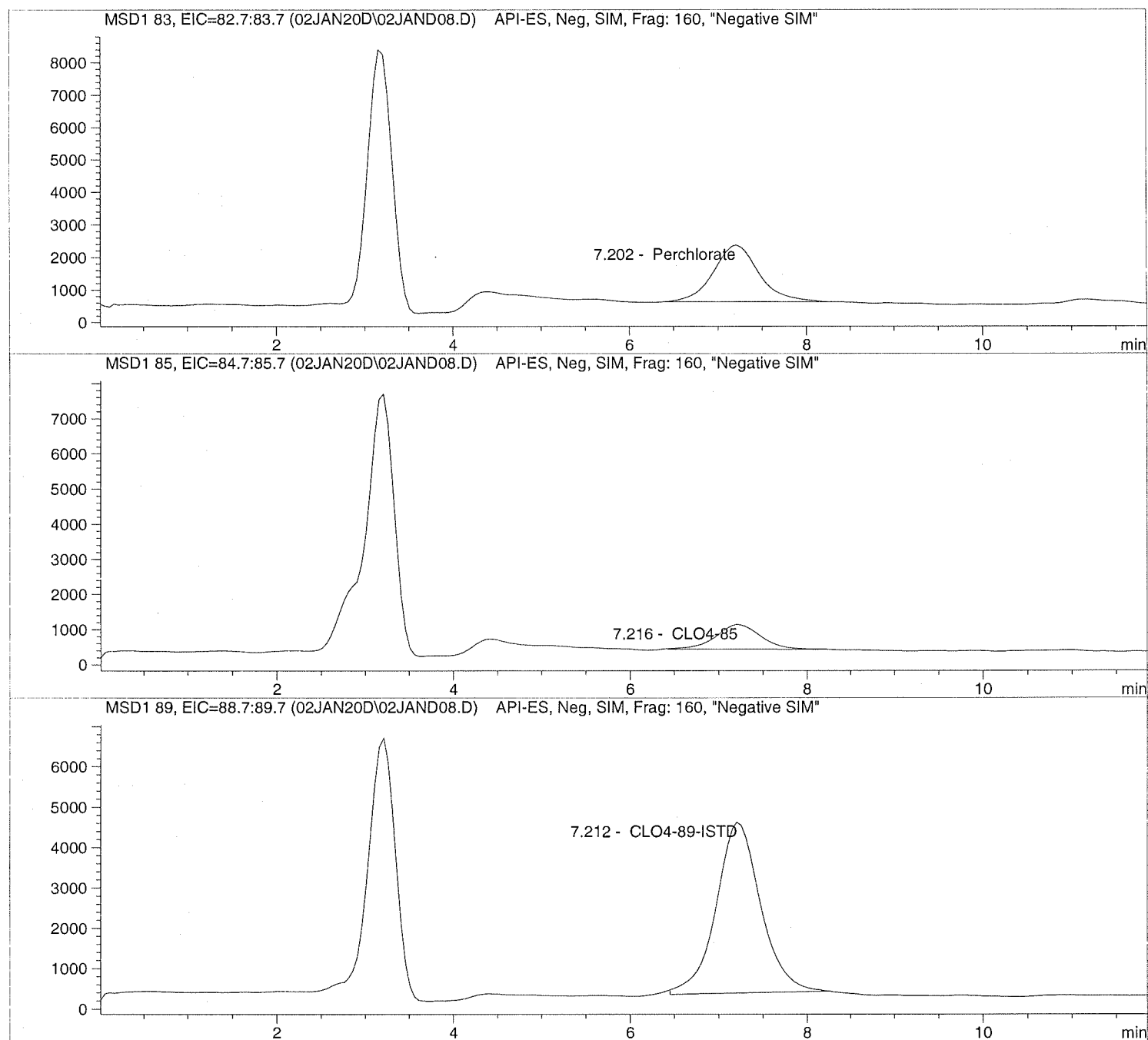
Sample Name: 1935915001

=====
Injection Date: 1/02/2020 14:49:42
Sample Name: 1935915001
Acq Operator: TNB

Seq Line: 8
Location: Vial 78
Inj. No.: 1
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\02JAN20D\02JAND08.D Sample Name: 1935915001

```

=====
Injection Date: 1/02/2020 14:49:42      Seq Line:      8
Sample Name:    1935915001              Location:      Vial 78
Acq Operator:   TNB                     Inj. No.:     1
                                           Inj. Vol.:    35 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  0.000
=====

```

```

=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.202	PBA	62635.7	1.5306	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.216	BBA	25080.2	1.9418	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.212	BBA	147744.2	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

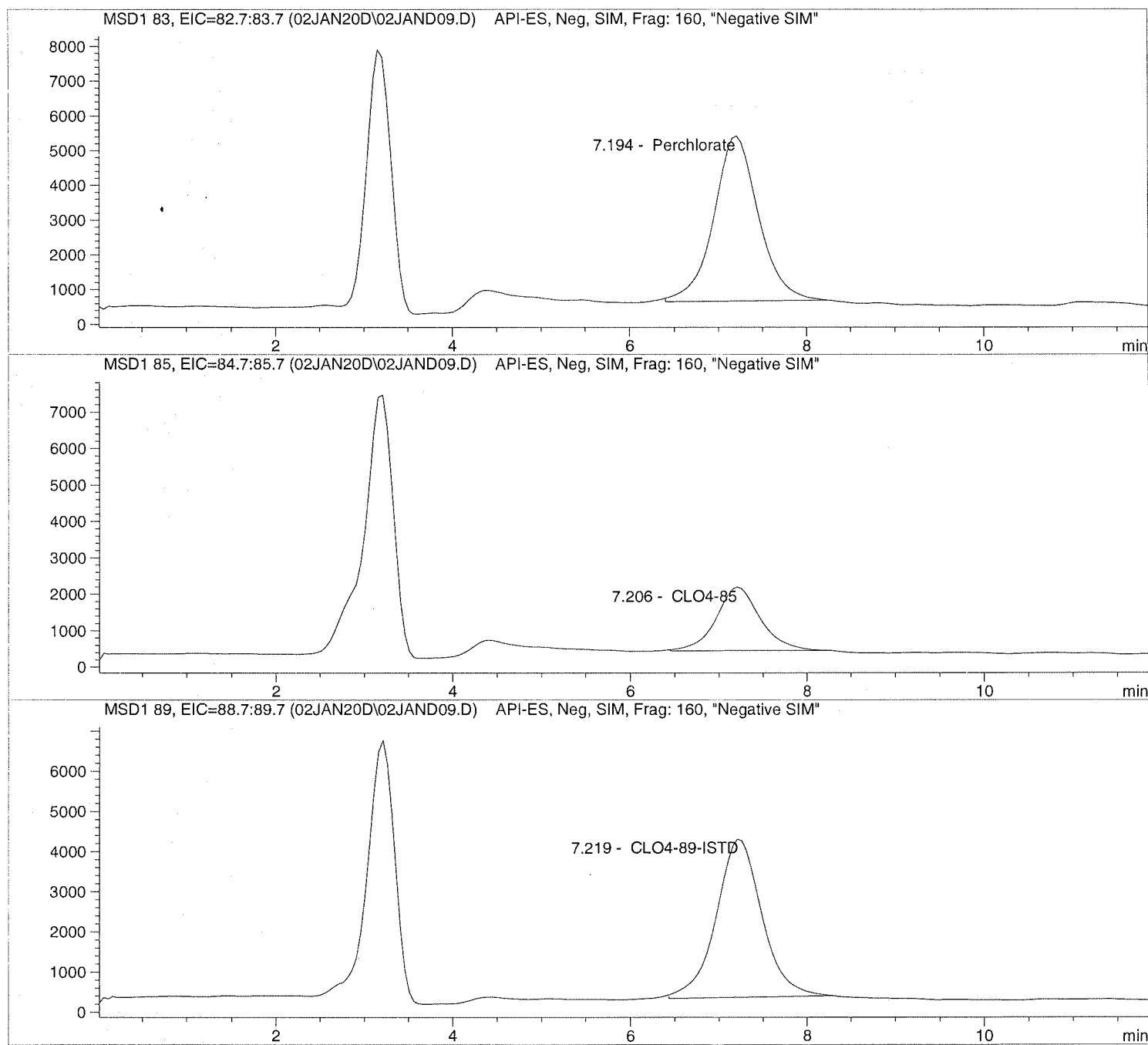
```

Data file: C:\HPCHEM\1\DATA\02JAN20D\02JAND09.D Sample Name: 1935915002 MS

```
=====
Injection Date: 1/02/2020 15:03:34 Seq Line: 9
Sample Name: 1935915002 MS Location: Vial 79
Acq Operator: TNB Inj. No.: 1
Inj. Vol.: 35 µl
=====
```

```
Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45
```

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\02JAN20D\02JAND09.D Sample Name: 1935915002 MS

```

=====
Injection Date: 1/02/2020 15:03:34      Seq Line:          9
Sample Name:   1935915002 MS             Location:          Vial 79
Acq Operator:  TNB                       Inj. No.:         1
                                           Inj. Vol.:        35 µl
=====

```

```

Acq. Method:   CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:  11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:           Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:         1.000000
Dilution:           1.000000
Sample Amount:      0.000
=====

```

```

=====
                          LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.194	BBA	167717.7	4.3410	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.206	BBA	60497.7	5.0378	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.219	BBA	142468.4	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

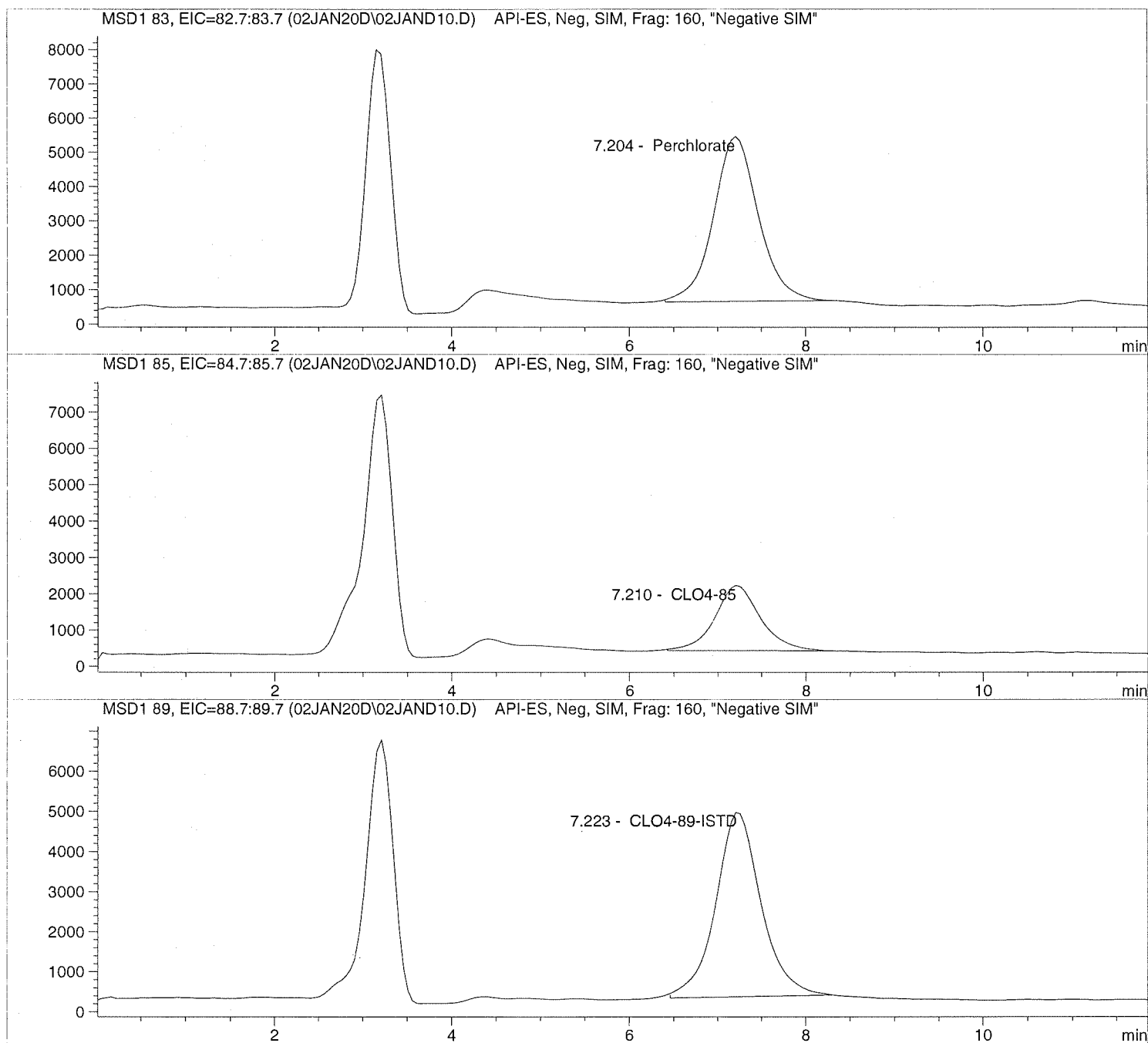
```


Data file: C:\HPCHEM\1\DATA\02JAN20D\02JAND10.D Sample Name: 1935915003 MSD

```
=====
Injection Date: 1/02/2020 15:17:28 Seq Line: 10
Sample Name: 1935915003 MSD Location: Vial 80
Acq Operator: TNB Inj. No.: 1
Inj. Vol.: 35 µl
=====
```

```
Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45
```

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\02JAN20D\02JAND10.D Sample Name: 1935915003 MSD

```

=====
Injection Date: 1/02/2020 15:17:28      Seq Line:      10
Sample Name:   1935915003 MSD          Location:      Vial 80
Acq Operator:  TNB                      Inj. No.:     1
                                           Inj. Vol.:    35 µl
=====

```

```

Acq. Method:   CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:  11/5/2019 08:44:45
=====

```

Perchlorate analysis

Sample Information

```

=====
Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  0.000
=====

```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.204	BBA	170226.0	3.8097	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.210	BBA	65303.6	4.6989	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.223	BBA	164738.8	5.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\02JAN20D\02JAND11.D

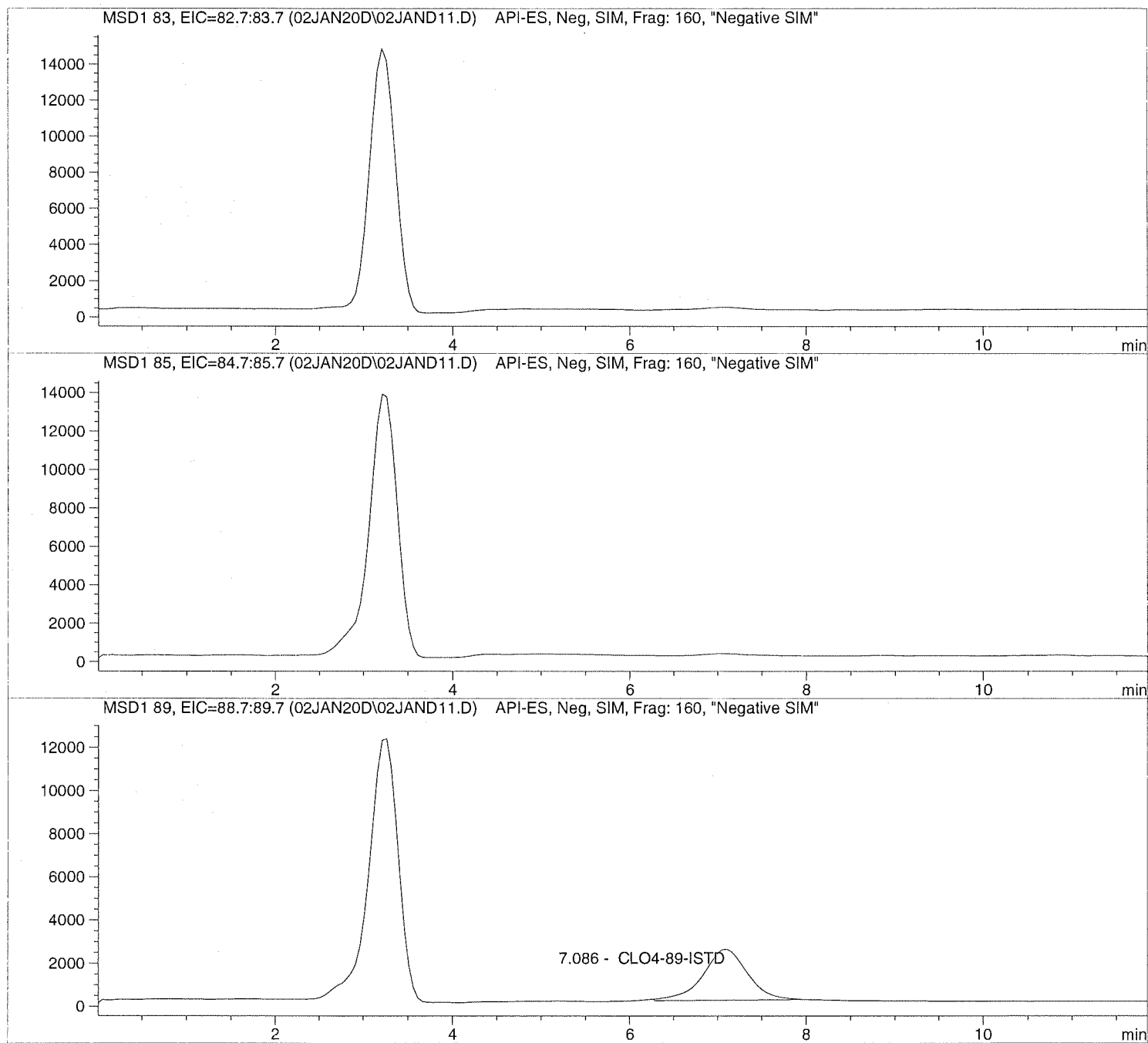
Sample Name: 1935915004

=====
Injection Date: 1/02/2020 15:31:32
Sample Name: 1935915004
Acq Operator: TNB

Seq Line: 11
Location: Vial 81
Inj. No.: 1
Inj. Vol.: 35 μ l

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\02JAN20D\02JAND11.D

Sample Name: 1935915004

```

=====
Injection Date: 1/02/2020 15:31:32      Seq Line:      11
Sample Name:   1935915004              Location:      Vial 81
Acq Operator:  TNB                     Inj. No.:     1
                                           Inj. Vol.:    35 µl
=====

```

```

Acq. Method:   CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:  11/5/2019 08:44:45
=====

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:    1.000000
Dilution:      1.000000
Sample Amount: 0.000
=====

```

```

=====
                          LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.086	BBA	82619.0	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```