LONGHORN ARMY AMMUNITION PLANT KARNACK, TEXAS

ADMINISTRATIVE RECORD

Volume 11

2020

Bate Stamp Numbers
00968276 – 00970242

Prepared for

Department of the Army
Longhorn Army Ammunition Plant

1976–2020

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

VOLUME 11

2020

A. Title: Report – Quarterly Evaluation Report, 1st Quarter (January-March) 2020 Groundwater Treatment Plant, Longhorn Army Ammunition Plant, Karnack, Texas, June 2020
Author(s): Department of the Army
Recipient: U.S. Environmental Protection Agency and Texas Commission on Environmental Quality
Date: June 9, 2020
Bate Stamp: 00968276 – 00968529

B. Title: (cont'd) Report – Appendix C to Quarterly Evaluation Report, 1st Quarter (January-March) 2020 Groundwater Treatment Plant, Longhorn Army Ammunition Plant, Karnack, Texas, June 2020
Author(s): Department of the Army
Recipient: U.S. Environmental Protection Agency and Texas Commission on Environmental Quality
Date: June 9, 2020
Bate Stamp: 00968530 – 00970242

QUARTERLY EVALUATION REPORT
1ST QUARTER (JANUARY-MARCH) 2020
GROUNDWATER TREATMENT PLANT
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

June 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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ACRONYMS AND ABBREVIATIONS

AECOM	AECOM Technical Services, Inc.
AMCV(s)	Air Monitoring Comparison Value
amsl	Above mean sea level
bgs	Below ground surface
Bhate	Bhate Environmental Associates, Inc.
CD	Compact disc
COD	Chemical oxygen demand
ESD	Explanation of Significant Difference
ESL(s)	Effects Screening Level
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
lbs/hr	Pounds per hour
LHAAP	Longhorn Army Ammunition Plant
µg/L	Micrograms per liter
$Mg(OH)_2$	Magnesium hydroxide
mV	Millivolts
NA	Not applicable
NaOH	Sodium hydroxide
No.	Number
NM	Not measured
ORP	Oxidation-reduction potential
PID	Photoionization detector

ppmv	Parts per million by volume
psi	Pounds per square inch
PVC	Polyvinyl chloride
ROD	Record of Decision
TAC	Texas Administrative Code
TCEQ	Texas Commission on Environmental Quality
tpy	Tons per year
UEP	Unlined Evaporation Pond
USEPA	United States Environmental Protection Agency
VOC(s)	Volatile Organic Compound(s)

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 release of treated water 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 March 2020.

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 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.

Groundwater is no longer extracted from LHAAP-16 because injections were completed as part of the final remedial action, which commenced in September 2019. The only groundwater treated and discussed within this report is from LHAAP-18/24.

On 11 January 2020, a tornado and straight line winds came through the area and broke the power lines. The breaker was shut off at the transformer until power lines could be repaired on 14 and 15 January 2020, by Ark-La-Tex. On 18 January 2020, power was lost to the GWTP and it was discovered that there was a blown fuse on the power lines. Ark-La-Tex Electric was called to the site to replace the fuse and power was restored to the GWTP the same day.

On 29 March 2020, there was a power glitch that caused the air compressors to shut down. The air compressors and FBR were restarted on the same day.

As shown on **Figure ES-1**, the total extracted groundwater volume from LHAAP-18/24 during the 1st quarter of 2020 was within normal range. The extracted groundwater volume was measured on a monthly basis as the sum of the difference between the flow meter totalizer reading at each ICT between the beginning and end of each month. Extraction quantities from LHAAP-18/24 were 333,818 gallons in January 2020; 421,406 gallons in February 2020; and 519,412 gallons in March 2020.

The average discharge flow rate from the GWTP was calculated as approximately 10 gallons per minute (gpm) during the 1st quarter of 2020. Approximately 3,045,932 gallons of groundwater treated by the GWTP was discharged to the Harrison Bayou.

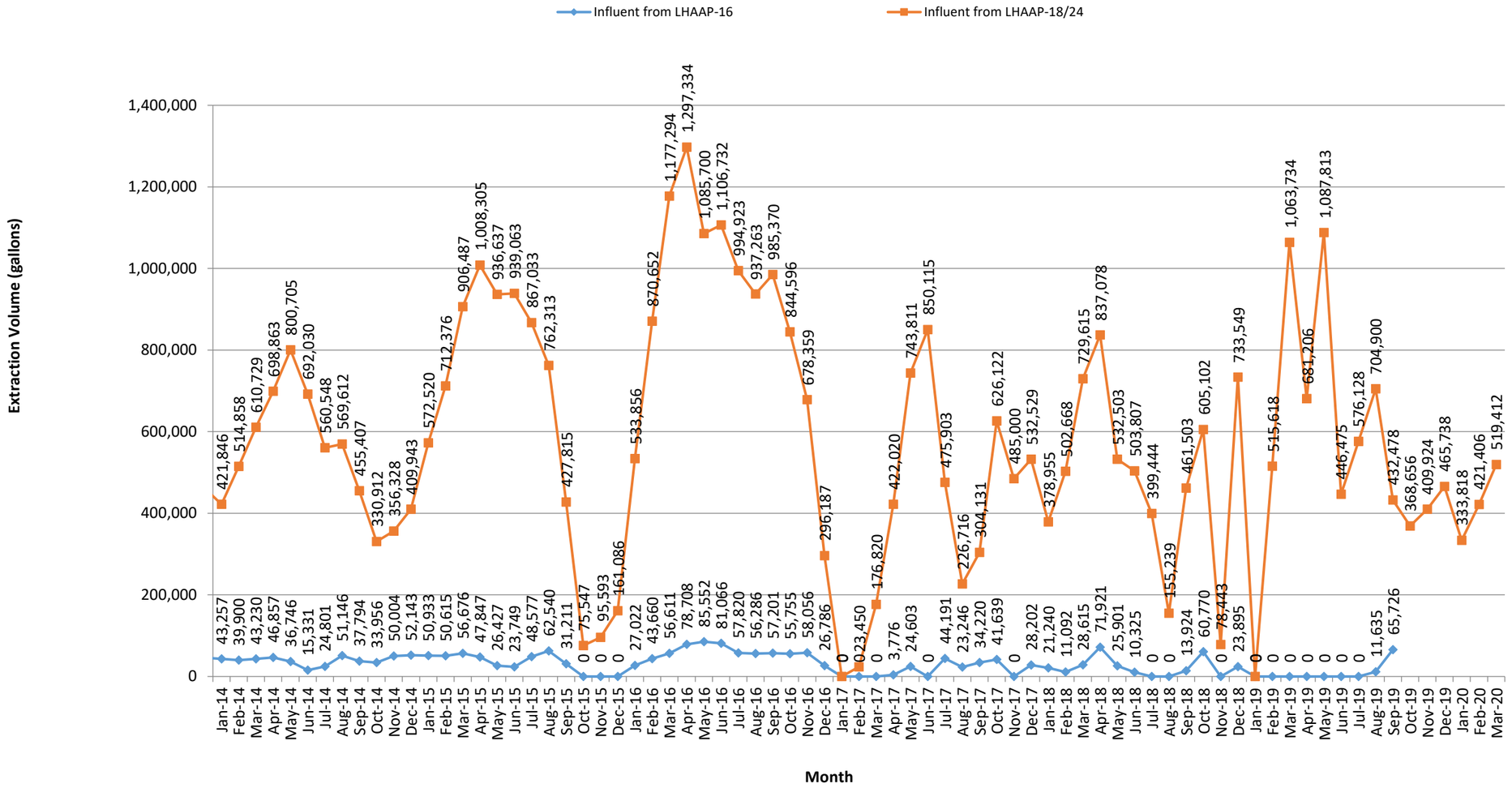
Grab perchlorate samples from the GWTP influent were collected on 7 January, 11 February, and 10 March 2020, and the following concentrations were reported: 13,000 micrograms per liter (µg/L); 11,000 µg/L; and 14,000 µg/L, respectively. A quarterly influent sample was collected and analyzed for perchlorate on 25 February 2020, and had a detection of 10,400 µg/L. Considering all four perchlorate results, the average perchlorate concentration in the GWTP influent during the quarter was 12,100 µg/L. No perchlorate concentrations in any effluent (TK-650) samples discharged to the Harrison Bayou exceeded the daily maximum effluent limit of 589 µg/L during the quarter.

As shown in **Table ES-1**, 1,188,795 gallons of treated groundwater was discharged directly to the Harrison Bayou and 1,857,137 gallons was discharged from the INF Pond to the Harrison Bayou during the 1st quarter of 2020. **Table ES-1** also presents the INF Pond staff gauge readings by date, which is used to determine the freeboard available in the pond.

The groundwater volume extracted for treatment at the GWTP ranged from a low of 333,818 gallons in January 2020 to a high of 519,412 gallons in March 2020. The total water extracted for treatment by the GWTP in the 1st quarter of 2020 was approximately 1,274,636 gallons. The 3 month average was approximately 424,879 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 the 1st quarter of 2020 (1,274,636 gallons) is slightly higher

than the volume of water discharged to the Harrison Bayou and the INF Pond combined (1,188,795). 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).

Figure ES-1: Groundwater Extracted Between January 2014 & March 2020
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 March 2020

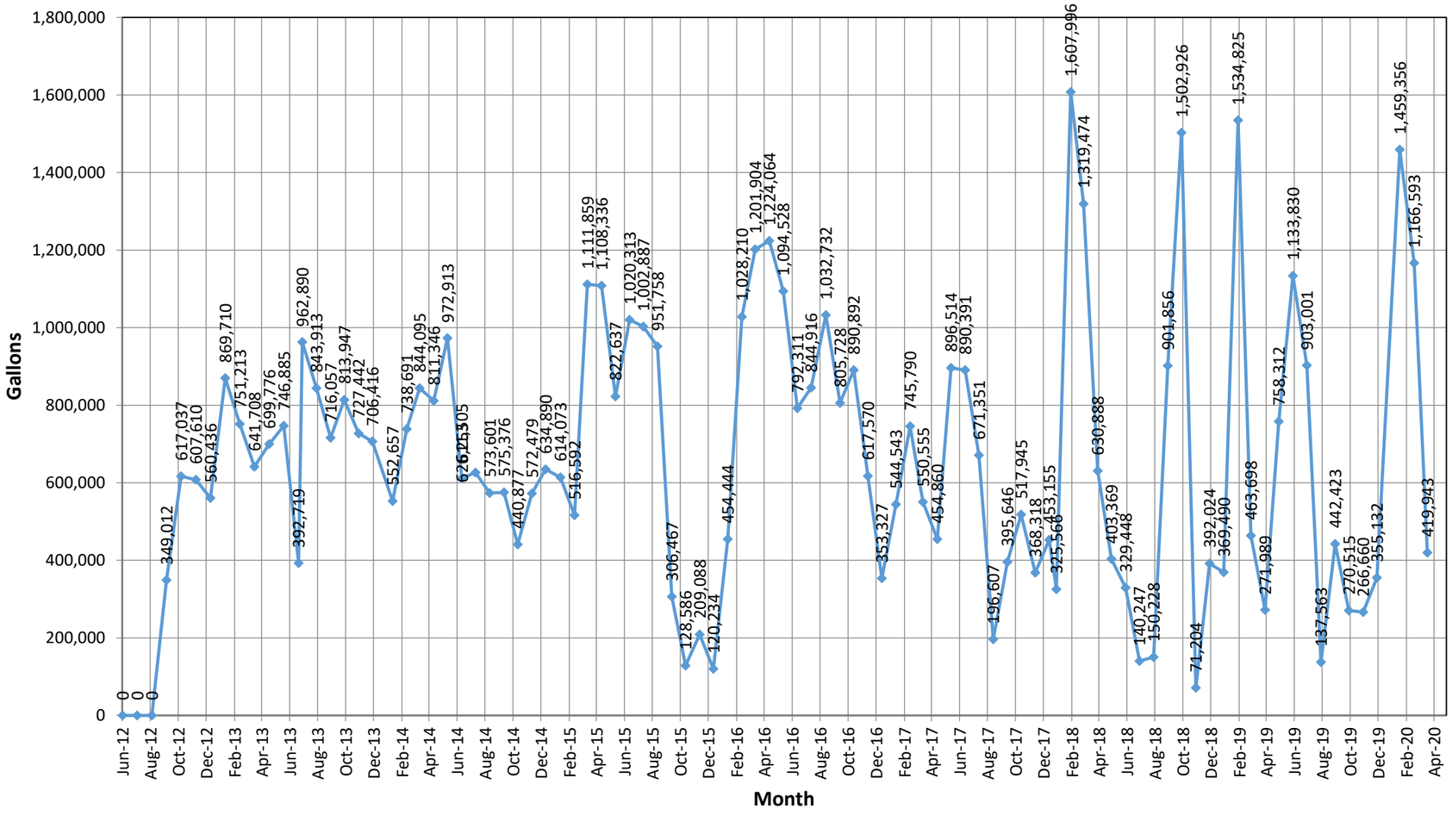


Table ES-1. Discharge Information to Harrison Bayou During 1st Quarter 2020

DATE	Harrison Bayou Flow (gpm)	Maximim 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)
01/01/2020	449	121	0	0	0	0	6.29
01/02/2020	387	113	48,205	0	0	48,205	6.35
01/03/2020	640	187	13,363	0	0	13,363	6.35
01/04/2020	568	153	0	0	0	0	6.34
01/05/2020	494	133	0	0	0	0	6.34
01/06/2020	426	124	53,833	0	0	53,833	6.33
01/07/2020	540	157	16,438	0	0	16,438	6.33
01/08/2020	448	131	17,393	0	0	17,393	6.33
01/09/2020	378	110	15,397	0	0	15,397	6.32
01/10/2020	331	96	15,738	0	0	15,738	6.32
01/11/2020	NA	NA	0	0	0	0	6.32
01/12/2020	NA	NA	0	0	0	0	6.47
01/13/2020	NA	NA	0	0	0	0	6.47
01/14/2020	NA	NA	0	0	0	0	6.57
01/15/2020	NA	NA	9,687	0	0	9,687	6.57
01/16/2020	901	263	0	0	0	0	6.69
01/17/2020	4,157	1,214	9,985	0	0	9,985	6.69
01/18/2020	FLOOD STAGE	MAXIMUM	0	0	0	0	6.68
01/19/2020	12,389	3,592	0	0	0	0	6.71
01/20/2020	7,388	2,159	15,491	0	0	15,491	6.70
01/21/2020	5,217	1,524	740	164,970	0	165,710	6.22
01/22/2020	4,528	1,323	5,554	237,850	0	243,404	5.75
01/23/2020	FLOOD STAGE	MAXIMUM	326	216,690	0	217,016	5.40
01/24/2020	13,569	3,935	0	0	0	0	5.40
01/25/2020	9,587	2,780	0	0	0	0	5.41
01/26/2020	7,152	2,074	0	0	0	0	5.41
01/27/2020	5,145	1,503	61,420	0	0	61,420	5.40
01/28/2020	10,928	3,193	15,013	0	0	15,013	5.40
01/29/2020	13,823	4,039	15,680	188,240	0	203,920	5.06

DATE	Harrison Bayou Flow (gpm)	Maximim 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)
01/30/2020	11,952	3,492	14,861	180,000	0	194,861	4.68
01/31/2020	9,659	2,822	15,089	127,433	0	142,522	4.40
02/01/2020	7,789	2,258	0	0	0	0	4.40
02/02/2020	6,423	1,862	0	0	0	0	4.40
02/03/2020	5,671	1,657	49,457	0	0	49,457	4.40
02/04/2020	4,270	1,247	14,568	0	0	14,568	4.40
02/05/2020	3,830	1,119	16,067	170,610	0	186,677	4.00
02/06/2020	FLOOD STAGE	MAXIMUM	13,441	58,125	0	71,566	3.90
02/07/2020	13,383	3,910	14,864	40,140	0	55,004	3.68
02/08/2020	11,396	3,304	0	0	0	0	3.68
02/09/2020	9,875	2,863	0	0	0	0	3.68
02/10/2020	8,420	2,460	47,315	0	0	47,315	3.78
02/11/2020	FLOOD STAGE	MAXIMUM	13,800	0	0	13,800	3.90
02/12/2020	FLOOD STAGE	MAXIMUM	16,649	195,938	0	212,587	3.68
02/13/2020	FLOOD STAGE	MAXIMUM	14,456	159,413	0	173,869	3.18
02/14/2020	FLOOD STAGE	MAXIMUM	9,973	117,728	0	127,701	2.35
02/15/2020	FLOOD STAGE	MAXIMUM	0	0	0	0	2.35
02/16/2020	18,398	5,335	0	0	0	0	2.35
02/17/2020	16,544	4,797	0	0	0	0	2.34
02/18/2020	14,225	4,156	48,945	0	0	48,945	2.34
02/19/2020	12,413	3,627	21,030	0	0	21,030	2.34
02/20/2020	FLOOD STAGE	MAXIMUM	20,250	0	0	20,250	2.58
02/21/2020	FLOOD STAGE	MAXIMUM	14,921	0	0	14,921	2.80
02/22/2020	18,269	5,298	0	0	0	0	2.80
02/23/2020	16,325	4,734	0	0	0	0	2.79
02/24/2020	14,487	4,233	52,796	0	0	52,796	2.80
02/25/2020	13,334	3,896	15,500	0	0	15,500	2.80
02/26/2020	9,825	2,871	16,821	0	0	16,821	2.80
02/27/2020	7,633	2,230	14,166	0	0	14,166	2.79
02/28/2020	6,526	1,907	9,620	0	0	9,620	2.79

DATE	Harrison Bayou Flow (gpm)	Maximim 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)
02/29/2020	NA	NA	0	0	0	0	2.79
03/01/2020	4,998	1,449	0	0	0	0	0.00
03/02/2020	4,554	1,330	32,973	0	0	32,973	2.78
03/03/2020	4,123	1,204	11,585	0	0	11,585	2.78
03/04/2020	3,191	932	8,163	0	0	8,163	2.78
03/05/2020	FLOOD STAGE	MAXIMUM	8,772	0	0	8,772	3.27
03/06/2020	FLOOD STAGE	MAXIMUM	8,162	0	0	8,162	3.27
03/07/2020	14,569	4,225	0	0	0	0	3.26
03/08/2020	11,896	3,449	0	0	0	0	3.26
03/09/2020	9,007	2,632	32,308	0	0	32,308	3.25
03/10/2020	6,680	1,952	11,981	0	0	11,981	3.25
03/11/2020	5,807	1,697	17,902	0	0	17,902	3.24
03/12/2020	5,035	1,471	17,979	0	0	17,979	3.24
03/13/2020	3,355	980	15,042	0	0	15,042	3.24
03/14/2020	3,255	943	0	0	0	0	3.24
03/15/2020	3,129	907	0	0	0	0	3.24
03/16/2020	3,070	897	53,515	0	0	53,515	3.25
03/17/2020	2,667	779	10,959	0	0	10,959	3.25
03/18/2020	FLOOD STAGE	MAXIMUM	12,253	0	0	12,253	3.40
03/19/2020	FLOOD STAGE	MAXIMUM	10,230	0	0	10,230	3.40
03/20/2020	FLOOD STAGE	MAXIMUM	14,294	0	0	14,294	3.45
03/21/2020	FLOOD STAGE	MAXIMUM	0	0	0	0	3.45
03/22/2020	FLOOD STAGE	MAXIMUM	0	0	0	0	3.45
03/23/2020	FLOOD STAGE	MAXIMUM	44,777	0	0	44,777	3.45
03/24/2020	FLOOD STAGE	MAXIMUM	13,192	0	0	13,192	3.70
03/25/2020	FLOOD STAGE	MAXIMUM	16,873	0	0	16,873	3.70
03/26/2020	FLOOD STAGE	MAXIMUM	5,758	0	0	5,758	3.69
03/27/2020	16,299	4,762	15,236	0	0	15,236	3.68
03/28/2020	13,268	3,847	0	0	0	0	3.68
03/29/2020	11,357	3,293	0	0	0	0	3.67

DATE	Harrison Bayou Flow (gpm)	Maximim 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)
03/30/2020	9,776	2,856	43,744	0	0	43,744	3.85
03/31/2020	FLOOD STAGE	MAXIMUM	14,245	0	0	14,245	4.00
TOTALS			**1,188,795**	**1,857,137**	**0**	**3,045,932**	

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

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 no longer receives flow from LHAAP-16 due to injections completed as a part of the final remedy implementation, which commenced in September 2019. The GWTP had previously received flow from eight extraction wells installed at LHAAP-16 as part of a historic treatability study. The extraction wells were installed in 1996 and 1997.

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

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 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.

On 11 January 2020, a tornado and straight line winds came through the area and broke the power lines. The breaker was shut off at the transformer until power lines could be repaired on 14 and 15 January 2020, by Ark-La-Tex. On 18 January 2020, power was lost to the GWTP and it was discovered that there was a blown fuse on the power lines. Ark-La-Tex Electric was called to the site to replace the fuse and power was restored to the GWTP the same day.

On 29 March 2020, there was a power glitch that caused the air compressors to shut down. The air compressors and FBR were restarted on the same day.

Flow rates for the treatment processes for metals and Volatile Organic Compounds (VOCs) ranged between 170 and 210 gallons per minute (gpm) with an average of approximately 185 gpm for the operating hours (i.e., this flow rate does not represent continuous flows). The GWTP operated for 188.5 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

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
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			

GWTP Stripper Operating Parameters

Stripper Tower	
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

Fluidized Bed Reactor	
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 1st quarter of 2020 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:

- 14-15 January 2020: Ark-La-Tex Electric was onsite to repair broken power lines and a broken power pole

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, Army trailer, around GWTP and containment area, and in GWTP Shop
- Removed manway on air stripper to inspect media
- Repaired opening arm on entrance gate of the GWTP
- Replaced broken 3-inch ball valve and broken 3-inch flanges on HCl line at truck unloading station
- Attempted to wash media in air stripper with dilute acid solution but the pump was not able to push it to the top of the air stripper
- Worked to repair pumps associated with belt filter press
- Removed fallen trees from power lines and roadway leading to GWTP
- Repaired broken 1-inch and ½-inch polyvinyl chloride (PVC) lines on discharge of P-390 (HCl feed pump)
- Rebuilt grundfos pumps
- Bush-hogged and conducted weed eating around wells at Sites 16 and 58
- Repaired weed eater
- Attempted to clear fallen trees on access road leading to 16WW57 and 16WW58 but conditions were too wet for bulldozer
- Used chainsaw and bulldozer to clear fallen trees blocking access to wells at Site 16

1.2.2.1 Safety

No safety activities were performed during this reporting period.

1.2.2.2 Lubrication

No lubrication maintenance was conducted during the reporting period.

1.2.2.3 Air Compressors

- 30 January 2020: Ingersoll-Rand was onsite to troubleshoot an overheating problem with compressor K-700-B
- 7 February 2020: Ingersoll-Rand was onsite to replace the thermostat in K-700-B

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

1.2.2.7 Miscellaneous Activities

- 18 January 2020: Ark-La-Tex Electric was onsite to replace a blown fuse on a power line
- 20-21 January 2020: Bloc Design was onsite to replace a broken conduit at TK-380
- 29 March 2020: Loss of power to air compressors and FBR due to a power glitch; all were restarted the same day

1.2.3 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**. There were a few instances noted in gray in the table below where either the pH or the ORP fell outside of the optimal range. From 11 January through 14 January 2020, the FBR was shutdown. It was offline due to a power outage.

Table 1. Enhanced Fluidized Bed Reactor Operating Parameters –1st Quarter 2020

Date	pH (7.1-7.4)	ORP (<-430mV)	Temperature (Degrees Fahrenheit)
1/1/2020	7.3	-444	56
1/2/2020	7.3	-453	56
1/3/2020	7.3	-453	56
1/4/2020	7.3	-439	56
1/5/2020	7.2	-431	56
1/6/2020	7.2	-430	59
1/7/2020	7.2	-429	58
1/8/2020	7.2	-448	57
1/9/2020	7.3	-431	58
1/10/2020	7.3	-431	59
1/11/2020	Power Loss	Power Loss	Power Loss

Date	pH (7.1-7.4)	ORP (<-430mV)	Temperature (Degrees Fahrenheit)
1/12/2020	Power Loss	Power Loss	Power Loss
1/13/2020	Power Loss	Power Loss	Power Loss
1/14/2020	Power Loss	Power Loss	Power Loss
1/15/2020	7.4	-464	59
1/16/2020	7.3	-472	59
1/17/2020	7.3	-485	58
1/18/2020	7.3	-488	58
1/19/2020	7.3	-490	58
1/20/2020	7.2	-494	57
1/21/2020	7.2	-497	56
1/22/2020	7.2	-469	52
1/23/2020	7.2	-435	52
1/24/2020	7.2	-438	52
1/25/2020	7.2	-431	53
1/26/2020	7.2	-433	53
1/27/2020	7.2	-439	55
1/28/2020	7.1	-429	55
1/29/2020	7.1	-444	55
1/30/2020	7.2	-441	54
1/31/2020	7.2	-434	54
2/1/2020	7.2	-440	55
2/2/2020	7.2	-438	55
2/3/2020	7.3	-446	58
2/4/2020	7.3	-435	60
2/5/2020	7.2	-442	57
2/6/2020	7.3	-450	54
2/7/2020	7.2	-439	53
2/8/2020	7.2	-429	55
2/9/2020	7.2	-440	57
2/10/2020	7.2	-436	60
2/11/2020	7.2	-448	58
2/12/2020	7.1	-442	57
2/13/2020	7.3	-437	55
2/14/2020	7.2	-445	54
2/15/2020	7.2	-429	55
2/16/2020	7.2	-436	56
2/17/2020	7.2	-442	58
2/18/2020	7.2	-437	61
2/19/2020	7.1	-439	58

Date	pH (7.1-7.4)	ORP (<-430mV)	Temperature (Degrees Fahrenheit)
2/20/2020	7.1	-427	55
2/21/2020	7.0	-432	54
2/22/2020	7.0	-433	55
2/23/2020	7.0	-441	55
2/24/2020	7.1	-444	59
2/25/2020	7.1	-425	58
2/26/2020	7.1	-427	57
2/27/2020	7.1	-434	56
2/28/2020	7.1	-444	56
2/29/2020	7.2	-431	58
3/1/2020	7.1	-439	59
3/2/2020	7.2	-451	60
3/3/2020	7.2	-445	63
3/4/2020	7.2	-437	61
3/5/2020	7.2	-460	62
3/6/2020	7.1	-468	62
3/7/2020	7.1	-441	62
3/8/2020	7.1	-437	62
3/9/2020	7.2	-443	62
3/10/2020	7.2	-436	63
3/11/2020	7.2	-425	65
3/12/2020	7.1	-434	67
3/13/2020	7.1	-429	67
3/14/2020	7.1	-425	67
3/15/2020	7.1	-439	66
3/16/2020	7.2	-441	63
3/17/2020	7.1	-436	64
3/18/2020	7.1	-429	65
3/19/2020	7.1	-427	67
3/20/2020	7.1	-435	67
3/21/2020	7.1	-426	66
3/22/2020	7.1	-440	65
3/23/2020	7.1	-440	64
3/24/2020	7.1	-444	65
3/25/2020	7.1	-447	66
3/26/2020	7.1	-445	69
3/27/2020	7.1	-429	69
3/28/2020	7.1	-432	69

Date	pH (7.1-7.4)	ORP (<-430mV)	Temperature (Degrees Fahrenheit)
3/29/2020	7.0	-437	69
3/30/2020	7.0	-429	67
3/31/2020	7.1	-439	66

1.5 Process Chemical Usage at GWTP

Approximate chemical consumption and the quantities delivered during the 1st quarter of 2020 are shown in **Table 2**.

Table 2. Chemical Usage and Delivery Table

Chemical	Usage 1st Quarter 2020	Quantity Delivered 1st Quarter 2020
Hydrochloric acid	440 gallons	2,250 gallons
Sodium hydroxide (35%)	875 gallons	3,780 gallons
Acetic acid (50%)	2 1/3 drums = 150 gallons	0
Phosphoric acid (75%)	16.5 liters	0
Magnesium hydroxide	260 gallons	0
Urea	122.1 pounds	0
Polymer (Magnafloc 110-L)	9.0 liters	0

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 1st quarter of 2020. Potentiometric surface maps are presented in **Appendix B** and groundwater elevations from the 1st quarter of 2020 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, and 12A 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. 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 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 31 January, 25 February, and 31 March 2020, 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 January through March 2020 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 (173.98 ft above mean sea level [amsl] in January 2020, 174.09 ft amsl in February 2020, and 174.28 ft amsl in March 2020) 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 333,818 gallons in January 2020; 421,406 gallons in February 2020; and 519,412 gallons in March 2020. Rainfall amounts recorded at the GWTP were 6.44 inches in January 2020, 7.21 inches in February 2020, and 7.16 inches in March 2020. This amount of rainfall resulted in over 161,281 gallons of additional water treated and discharged but not metered with the influent totals.

During the reporting period, approximately 1,188,795 gallons of treated groundwater was discharged to Harrison Bayou from the GWTP. In addition, approximately 1,857,137 gallons of 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. No water was released to the INF Pond from the GWTP in the 1st quarter of 2020. **Table 4** presents the daily discharge rates and volume for the 1st quarter of 2020.

Groundwater levels in Wilcox Formation wells (generally > 40 to 50 ft bgs) were measured during the 1st quarter of 2020 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 January, February, and March 2020 gauging events, respectively. Groundwater in the 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 10,768 gallons per day (gpd) in January 2020, approximately 14,531 gpd in February 2020, and approximately 16,755 gpd in March 2020.

The volume of groundwater removed from LHAAP-18/24 during the 1st quarter of 2020 measured approximately 1,274,636 gallons, based on total flow measured from the extraction wells and ICT wells. **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 344,213 gallons in January 2020; 424,639 gallons in February 2020; and 419,943 gallons in March 2020 for a total of 1,188,795 gallons discharged in the 1st quarter of 2020. The difference between the influent and effluent volumes is approximately 6.97%. However, considering the over 393,053 gallons of water within the treatment plant as of 31 March 2020, this percent difference is even lower, 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**, 17 of 27 ICTs and wells produced water for the entirety of the 1st quarter of 2020. ICT EW-01 produced water in March 2020 only and ICT 12D produced water in January and February but not in March 2020.

2.4 Groundwater Monitoring at LHAAP-18/24

No groundwater was sampled for offsite analysis at LHAAP-18/24 in the 1st quarter of 2020. The next sampling event will be completed in the 2nd quarter of 2020.

2.5 Groundwater Treatment Plant Sampling and Analysis

As part of the GWTP operations, samples from various water streams are required to be collected and analyzed for the parameters in accordance with the *Final Revised Sampling and Analysis Plan for Groundwater Treatment Plan and Well Fields* (AECOM Technical Services, Inc. [AECOM], September 2017), which was developed in accordance with the Interim Record of Decision (ROD) and the TCEQ letter dated January 8, 2002 (see Administrate Record Volume 1 of 4 in 2002, Document A). Besides the 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 1st quarter of 2020. The complete laboratory results are provided on a compact disc (CD) (**Appendix C**).

2.5.1 Perchlorate Sampling

Table 6 presents the weekly effluent perchlorate results for the 1st quarter of 2020. None of the effluent samples exceeded the protocol for discharge (**Appendix D**) for perchlorate. All of the

GWTP effluent was discharged to the Harrison Bayou for the entirety of the 1st quarter. Samples presented in **Table 6** also include samples collected before the ion exchange to verify that the FBR properly treated water for perchlorate. Treated groundwater from the GWTP was discharged to Harrison Bayou during the current quarter when effluent perchlorate concentrations were less than the daily maximum concentration of 589 µg/L and adequate flow in the bayou was observed.

Table 6 also presents the effluent concentration of ammonia as N and ortho-phosphate, which are soluble nutrients used by the microbes in the metabolic process within the FBR. Effluent samples at the reactor outlet are analyzed to verify that trace amounts of these are present, which indicates that there is enough to sustain the biomass. If there is bypassing or short circuiting in the reactor and perchlorate is not being fully degraded, elevated levels of these nutrients may be present at the FBR outlet. Ortho-phosphate levels stayed relatively stagnant for the entire quarter.

Three monthly grab samples from the influent to the GWTP (TK-140) and one quarterly grab sample (total of four influent samples) were collected in 1st quarter of 2020. The perchlorate concentrations in these samples ranged from 10,400 µg/L to 14,000 µg/L.

2.5.2 VOC Sampling

Tables 7, 8 and, 9 present the effluent VOC results for January, February, and March 2020. Sampling of the effluent for VOCs was conducted on a biweekly basis beginning on 7 January 2020. The results, where applicable, were below the discharge limits. The tables also provide monthly influent concentrations for VOCs and perchlorate.

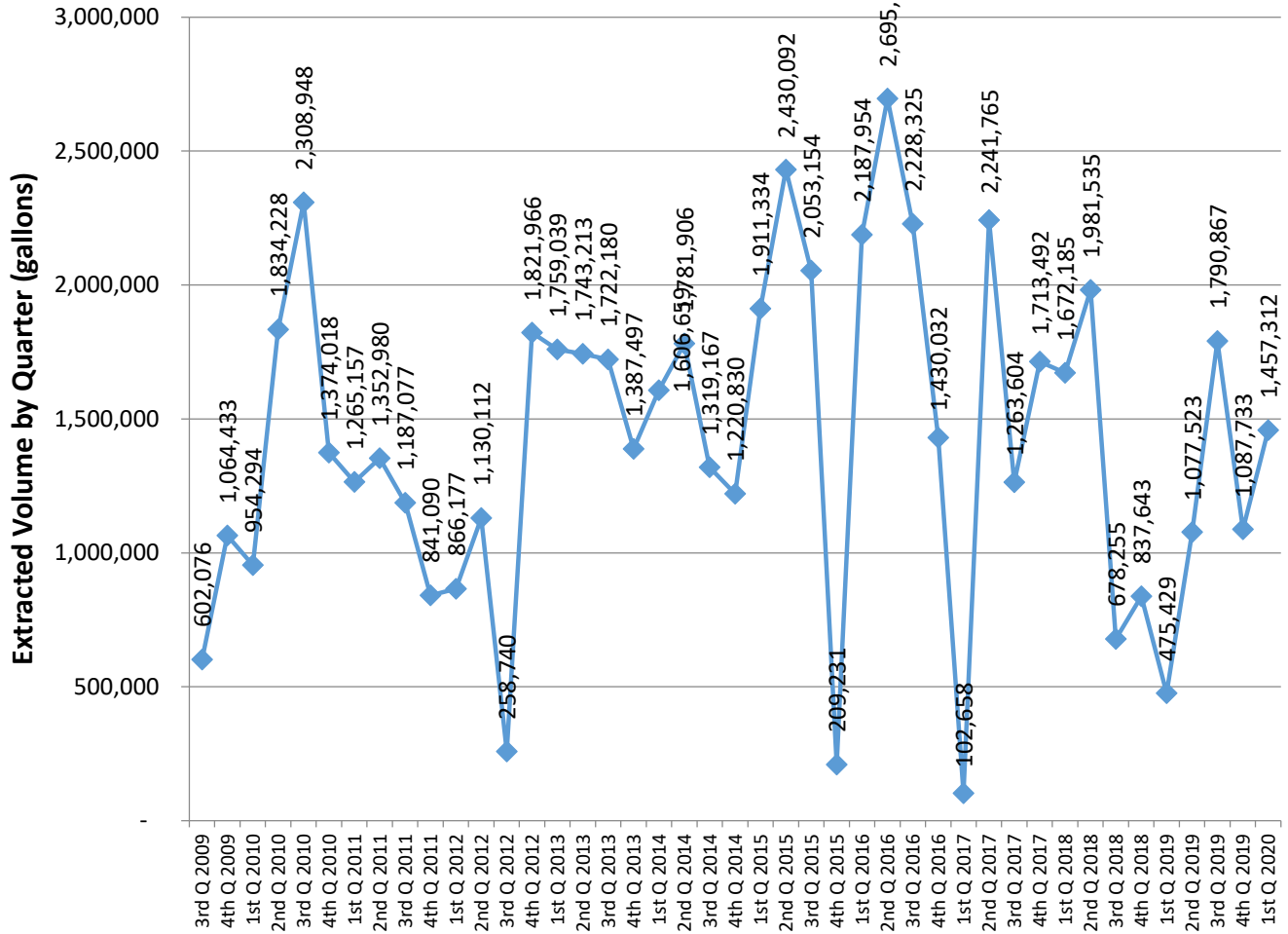
2.5.3 Monthly Metals Sampling

As per the Final Installation-Wide Work Plan (Bhate Environmental Associates, Inc. [Bhate], May 2018), the monthly metals sampling is reported in **Tables 7, 8, and 9**. 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, metals, and perchlorate was conducted during this quarter and the results were below the discharge limits. **Table 10** presents the analytical results for the 1st quarter of 2020.

Figure 2-1
Quarterly Extraction Rate



Extraction rate beginning at 3rd Q 2013 is based on FIT-140 (influent totalizer)

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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) 1/31/2020	Groundwater Elevation (feet amsl) 1/31/2020	Depth to Water (feet) 2/25/2020	Groundwater Elevation (feet amsl) 2/25/2020	Depth to Water (feet) 3/31/2020	Groundwater Elevation (feet amsl) 3/31/2020
BGPZ-1	Piezometer	184.99	8.77	176.22	8.21	176.78	8.00	176.99
BGPZ-2	Piezometer	184.39	14.30	170.09	14.08	170.31	13.90	170.49
BGPZ-3	Piezometer	180.35	8.85	171.50	7.93	172.42	7.78	172.57
BGPZ-4	Piezometer	177.77	8.59	169.18	7.72	170.05	7.57	170.20
BGPZ-5	Piezometer	180.76	11.89	168.87	11.17	169.59	12.96	167.80
BGPZ-6	Piezometer	197.82	27.41	170.41	27.19	170.63	27.03	170.79
BGPZ-7	Piezometer	195.96	27.10	168.86	26.88	169.08	26.71	169.25
BGPZ-8	Piezometer	197.08	29.22	167.86	28.95	168.13	28.82	168.26
BGPZ-9	Piezometer	196.45	27.79	168.66	27.60	168.85	27.47	168.98
BGPZ-10	Piezometer	197.00	28.06	168.94	27.87	169.13	27.70	169.30
BGPZ-11	Piezometer	196.99	28.20	168.79	27.94	169.05	27.81	169.18
BGPZ-12	Piezometer	188.17	NA	Plugged	NA	Plugged	NA	Plugged
AWD-1	Monitoring Well	182.27	10.65	171.62	10.43	171.84	10.22	172.05
AWD-2	Monitoring Well	186.78	12.80	173.98	12.69	174.09	12.50	174.28
AWD-3	Monitoring Well	200.13	28.29	171.84	28.10	172.03	27.92	172.21
AWD-4	Monitoring Well	193.89	23.16	170.73	22.95	170.94	22.80	171.09
MW-1	Monitoring Well	199.22	27.42	171.80	27.17	172.05	26.98	172.24
MW-2	Monitoring Well	196.73	27.08	169.65	26.84	169.89	26.67	170.06
MW-3	Monitoring Well	196.54	26.72	169.82	26.50	170.04	26.35	170.19
MW-4	Monitoring Well	197.27	26.90	170.37	26.69	170.58	26.50	170.77
MW-5	Monitoring Well	194.97	25.15	169.82	24.89	170.08	24.67	170.30
MW-6	Monitoring Well	192.18	22.88	169.30	22.60	169.58	22.41	169.77
MW-7	Monitoring Well	188.47	18.67	169.80	18.41	170.06	18.25	170.22

Location Identification	Type	Reference Elevation (feet amsl)	Depth to Water (feet) 1/31/2020	Groundwater Elevation (feet amsl) 1/31/2020	Depth to Water (feet) 2/25/2020	Groundwater Elevation (feet amsl) 2/25/2020	Depth to Water (feet) 3/31/2020	Groundwater Elevation (feet amsl) 3/31/2020
MW-8	Monitoring Well	187.13	15.34	171.79	15.15	171.98	14.94	172.19
MW-9	Monitoring Well	184.73	14.80	169.93	14.57	170.16	14.40	170.33
MW-10	Monitoring Well	178.12	8.87	169.25	8.33	169.79	8.17	169.95
MW-11	Monitoring Well	184.65	15.15	169.50	15.02	169.63	14.90	169.75
MW-12	Monitoring Well	178.33	8.25	170.08	7.75	170.58	7.58	170.75
MW-13	Monitoring Well	176.72	7.45	169.27	7.09	169.63	6.83	169.89
MW-14	Monitoring Well	186.19	13.51	172.68	13.29	172.90	13.10	173.09
MW-16	Monitoring Well	178.59	9.32	169.27	8.79	169.80	8.31	170.28
MW-17	Monitoring Well	179.03	9.90	169.13	9.68	169.35	9.47	169.56
MW-18	Monitoring Well	178.58	8.78	169.80	8.50	170.08	8.28	170.30
MW-19	Monitoring Well	178.60	8.49	170.11	8.22	170.38	7.97	170.63
MW-20	Monitoring Well	186.64	11.93	174.71	11.65	174.99	11.40	175.24
MW-21	Monitoring Well	198.70	30.40	168.30	30.19	168.51	30.03	168.67
MW-22	Monitoring Well	197.51	27.60	169.91	27.39	170.12	27.12	170.39
MW-23	Monitoring Well	198.79	27.53	171.26	27.30	171.49	27.14	171.65
101	Monitoring Well	197.53	8.59	188.94	8.12	189.41	7.21	190.32
102	Monitoring Well	193.94	20.02	173.92	19.81	174.13	19.60	174.34
109	Monitoring Well	197.02	28.30	168.72	28.12	168.90	27.91	169.11
120	Monitoring Well	184.19	13.74	170.45	13.51	170.68	13.25	170.94
123	Monitoring Well	186.21	13.66	172.55	13.50	172.71	13.29	172.92
125	Monitoring Well	196.28	24.95	171.33	24.88	171.40	24.65	171.63
126	Monitoring Well	199.37	29.05	170.32	28.77	170.60	28.55	170.82
129	Monitoring Well	197.24	26.03	171.21	25.91	171.33	25.70	171.54
130	Monitoring Well	177.73	7.94	169.79	7.42	170.31	6.77	170.96
C-01	Monitoring Well	193.89	24.16	169.73	23.96	169.93	23.75	170.14

Location Identification	Type	Reference Elevation (feet amsl)	Depth to Water (feet) 1/31/2020	Groundwater Elevation (feet amsl) 1/31/2020	Depth to Water (feet) 2/25/2020	Groundwater Elevation (feet amsl) 2/25/2020	Depth to Water (feet) 3/31/2020	Groundwater Elevation (feet amsl) 3/31/2020
C-02	Monitoring Well	175.95	6.44	169.51	6.11	169.84	5.49	170.46
C-03	Monitoring Well	196.34	26.87	169.47	26.65	169.69	26.49	169.85
C-04	Monitoring Well	194.64	24.47	170.17	24.23	170.41	24.05	170.59
C-04A	Monitoring Well	194.61	24.15	170.46	23.94	170.67	23.80	170.81
C-05	Monitoring Well	180.74	12.18	168.56	11.90	168.84	11.19	169.55
C-06	Monitoring Well	192.22	24.70	167.52	24.52	167.70	24.35	167.87
C-07	Monitoring Well	196.80	27.92	168.88	27.75	169.05	27.61	169.19
C-08	Monitoring Well	193.10	23.62	169.48	23.45	169.65	23.24	169.86
C-09	Monitoring Well	202.35	32.15	170.20	31.97	170.38	31.80	170.55
C-10	Monitoring Well	201.86	31.70	170.16	31.55	170.31	31.37	170.49
17WW08	Monitoring Well	179.72	10.22	169.50	9.57	170.15	9.12	170.60
18WW01	Monitoring Well	201.31	31.17	170.14	30.98	170.33	30.72	170.59
18WW02	Monitoring Well	179.30	9.70	169.60	9.29	170.01	8.51	170.79
18WW03	Monitoring Well	195.59	26.77	168.82	26.51	169.08	26.33	169.26
18WW04	Monitoring Well	183.74	15.91	167.83	15.74	168.00	15.44	168.30
18WW05	Monitoring Well	189.59	21.07	168.52	20.92	168.67	20.70	168.89
18WW06	Monitoring Well	179.70	10.51	169.19	9.96	169.74	9.21	170.49
18WW07	Monitoring Well	183.67	NM	NM	NM	NM	NM	NM
18WW08	Monitoring Well	177.77	9.86	167.91	9.33	168.44	8.39	169.38
18WW09	Monitoring Well	177.51	10.20	167.31	9.69	167.82	8.70	168.81
18WW10	Monitoring Well	182.26	13.75	168.51	13.29	168.97	12.98	169.28
18WW11	Monitoring Well	182.29	14.09	168.20	13.61	168.68	13.31	168.98
18WW14	Monitoring Well	186.47	15.73	170.74	15.44	171.03	15.22	171.25
18WW15	Monitoring Well	186.24	15.30	170.94	15.02	171.22	14.79	171.45
18WW16	Monitoring Well	201.88	32.58	169.30	32.20	169.68	31.93	169.95

Location Identification	Type	Reference Elevation (feet amsl)	Depth to Water (feet) 1/31/2020	Groundwater Elevation (feet amsl) 1/31/2020	Depth to Water (feet) 2/25/2020	Groundwater Elevation (feet amsl) 2/25/2020	Depth to Water (feet) 3/31/2020	Groundwater Elevation (feet amsl) 3/31/2020
18WW18	Monitoring Well	196.82	27.31	169.51	27.10	169.72	26.89	169.93
18WW19	Monitoring Well	179.56	12.10	167.46	11.82	167.74	11.33	168.23
18WW20	Monitoring Well	180.42	12.92	167.50	12.64	167.78	12.09	168.33
18WW21	Monitoring Well	195.20	26.06	169.14	25.95	169.25	25.68	169.52
18WW22	Monitoring Well	195.37	26.24	169.13	25.99	169.38	25.71	169.66
18WW24	Monitoring Well	176.40	9.15	167.25	8.19	168.21	6.87	169.53
18WW25	Monitoring Well	175.15	8.75	166.40	7.83	167.32	5.93	169.22
18CPTMW01SW	Monitoring Well	198.20	27.76	170.44	27.52	170.68	27.30	170.90
18CPTMW01DW	Monitoring Well	197.92	28.42	169.50	28.18	169.74	27.95	169.97
18CPTMW03SW	Monitoring Well	198.53	29.26	169.27	29.08	169.45	28.87	169.66
18CPTMW04	Monitoring Well	196.60	24.80	171.80	24.57	172.03	24.35	172.25
18CPTMW04SW	Monitoring Well	196.42	27.06	169.36	26.72	169.70	26.50	169.92
18CPTMW06	Monitoring Well	198.12	28.85	169.27	28.60	169.52	28.39	169.73
18CPTMW07	Monitoring Well	197.32	27.87	169.45	27.61	169.71	27.40	169.92
18CPTMW08SW	Monitoring Well	196.38	26.91	169.47	26.70	169.68	26.52	169.86
18CPTMW08DW	Monitoring Well	196.59	27.37	169.22	27.12	169.47	26.90	169.69
18CPTMW10SW	Monitoring Well	186.98	17.42	169.56	17.20	169.78	16.97	170.01
18CPTMW10DW	Monitoring Well	187.38	17.90	169.48	17.65	169.73	17.41	169.97
18CPTMW12SW	Monitoring Well	190.90	21.29	169.61	21.06	169.84	20.77	170.13
18CPTMW12DW	Monitoring Well	190.25	20.55	169.70	20.33	169.92	20.08	170.17
18CPTMW14	Monitoring Well	196.69	26.54	170.15	26.30	170.39	26.03	170.66
18CPTMW15	Monitoring Well	179.79	9.72	170.07	9.15	170.64	8.29	171.50
18CPTMW16	Monitoring Well	175.37	6.93	168.44	6.48	168.89	5.54	169.83
18CPTMW18	Monitoring Well	194.53	26.53	168.00	26.29	168.24	26.05	168.48
18CPTMW19	Monitoring Well	193.59	23.00	170.59	22.72	170.87	22.50	171.09

Location Identification	Type	Reference Elevation (feet amsl)	Depth to Water (feet) 1/31/2020	Groundwater Elevation (feet amsl) 1/31/2020	Depth to Water (feet) 2/25/2020	Groundwater Elevation (feet amsl) 2/25/2020	Depth to Water (feet) 3/31/2020	Groundwater Elevation (feet amsl) 3/31/2020
18CPTMW19SW	Monitoring Well	193.29	24.09	169.20	25.85	167.44	25.62	167.67
18CPTMW22SW	Monitoring Well	187.79	18.40	169.39	18.18	169.61	17.94	169.85
18CPTMW22R	Monitoring Well	187.23	10.79	176.44	10.35	176.88	9.23	178.00
18CPTMW22DW	Monitoring Well	188.00	19.37	168.63	19.10	168.90	18.88	169.12
18CPTMW23	Monitoring Well	177.47	8.65	168.82	8.18	169.29	7.52	169.95
18CPTMW23SW	Monitoring Well	177.43	8.95	168.48	8.40	169.03	7.89	169.54
18CPTMW24	Monitoring Well	194.89	26.26	168.63	26.07	168.82	25.85	169.04
18CPTMW26	Monitoring Well	182.60	15.95	166.65	15.88	166.72	15.65	166.95
18CPTMW26SW	Monitoring Well	182.00	12.80	169.20	12.55	169.45	12.17	169.83
1824HBSW7	Surface Water Sample	167.92	3.00	164.92	3.08	164.84	5.08	162.84
Note: NM-not measured								

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Table 4. Treated Groundwater Discharged – January through March 2020

DATE	Harrison Bayou Flow (gpm)	Maximim 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)
01/01/2020	449	121	0	0	0	0	6.29
01/02/2020	387	113	48,205	0	0	48,205	6.35
01/03/2020	640	187	13,363	0	0	13,363	6.35
01/04/2020	568	153	0	0	0	0	6.34
01/05/2020	494	133	0	0	0	0	6.34
01/06/2020	426	124	53,833	0	0	53,833	6.33
01/07/2020	540	157	16,438	0	0	16,438	6.33
01/08/2020	448	131	17,393	0	0	17,393	6.33
01/09/2020	378	110	15,397	0	0	15,397	6.32
01/10/2020	331	96	15,738	0	0	15,738	6.32
01/11/2020	NA	NA	0	0	0	0	6.32
01/12/2020	NA	NA	0	0	0	0	6.47
01/13/2020	NA	NA	0	0	0	0	6.47
01/14/2020	NA	NA	0	0	0	0	6.57
01/15/2020	NA	NA	9,687	0	0	9,687	6.57
01/16/2020	901	263	0	0	0	0	6.69
01/17/2020	4,157	1,214	9,985	0	0	9,985	6.69
01/18/2020	FLOOD STAGE	MAXIMUM	0	0	0	0	6.68
01/19/2020	12,389	3,592	0	0	0	0	6.71
01/20/2020	7,388	2,159	15,491	0	0	15,491	6.70
01/21/2020	5,217	1,524	740	164,970	0	165,710	6.22
01/22/2020	4,528	1,323	5,554	237,850	0	243,404	5.75
01/23/2020	FLOOD STAGE	MAXIMUM	326	216,690	0	217,016	5.40
01/24/2020	13,569	3,935	0	0	0	0	5.40
01/25/2020	9,587	2,780	0	0	0	0	5.41
01/26/2020	7,152	2,074	0	0	0	0	5.41
01/27/2020	5,145	1,503	61,420	0	0	61,420	5.40
01/28/2020	10,928	3,193	15,013	0	0	15,013	5.40
01/29/2020	13,823	4,039	15,680	188,240	0	203,920	5.06

DATE	Harrison Bayou Flow (gpm)	Maximim 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)
01/30/2020	11,952	3,492	14,861	180,000	0	194,861	4.68
01/31/2020	9,659	2,822	15,089	127,433	0	142,522	4.40
02/01/2020	7,789	2,258	0	0	0	0	4.40
02/02/2020	6,423	1,862	0	0	0	0	4.40
02/03/2020	5,671	1,657	49,457	0	0	49,457	4.40
02/04/2020	4,270	1,247	14,568	0	0	14,568	4.40
02/05/2020	3,830	1,119	16,067	170,610	0	186,677	4.00
02/06/2020	FLOOD STAGE	MAXIMUM	13,441	58,125	0	71,566	3.90
02/07/2020	13,383	3,910	14,864	40,140	0	55,004	3.68
02/08/2020	11,396	3,304	0	0	0	0	3.68
02/09/2020	9,875	2,863	0	0	0	0	3.68
02/10/2020	8,420	2,460	47,315	0	0	47,315	3.78
02/11/2020	FLOOD STAGE	MAXIMUM	13,800	0	0	13,800	3.90
02/12/2020	FLOOD STAGE	MAXIMUM	16,649	195,938	0	212,587	3.68
02/13/2020	FLOOD STAGE	MAXIMUM	14,456	159,413	0	173,869	3.18
02/14/2020	FLOOD STAGE	MAXIMUM	9,973	117,728	0	127,701	2.35
02/15/2020	FLOOD STAGE	MAXIMUM	0	0	0	0	2.35
02/16/2020	18,398	5,335	0	0	0	0	2.35
02/17/2020	16,544	4,797	0	0	0	0	2.34
02/18/2020	14,225	4,156	48,945	0	0	48,945	2.34
02/19/2020	12,413	3,627	21,030	0	0	21,030	2.34
02/20/2020	FLOOD STAGE	MAXIMUM	20,250	0	0	20,250	2.58
02/21/2020	FLOOD STAGE	MAXIMUM	14,921	0	0	14,921	2.80
02/22/2020	18,269	5,298	0	0	0	0	2.80
02/23/2020	16,325	4,734	0	0	0	0	2.79
02/24/2020	14,487	4,233	52,796	0	0	52,796	2.80
02/25/2020	13,334	3,896	15,500	0	0	15,500	2.80
02/26/2020	9,825	2,871	16,821	0	0	16,821	2.80
02/27/2020	7,633	2,230	14,166	0	0	14,166	2.79
02/28/2020	6,526	1,907	9,620	0	0	9,620	2.79
02/29/2020	NA	NA	0	0	0	0	2.79

DATE	Harrison Bayou Flow (gpm)	Maximim 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)
03/01/2020	4,998	1,449	0	0	0	0	0.00
03/02/2020	4,554	1,330	32,973	0	0	32,973	2.78
03/03/2020	4,123	1,204	11,585	0	0	11,585	2.78
03/04/2020	3,191	932	8,163	0	0	8,163	2.78
03/05/2020	FLOOD STAGE	MAXIMUM	8,772	0	0	8,772	3.27
03/06/2020	FLOOD STAGE	MAXIMUM	8,162	0	0	8,162	3.27
03/07/2020	14,569	4,225	0	0	0	0	3.26
03/08/2020	11,896	3,449	0	0	0	0	3.26
03/09/2020	9,007	2,632	32,308	0	0	32,308	3.25
03/10/2020	6,680	1,952	11,981	0	0	11,981	3.25
03/11/2020	5,807	1,697	17,902	0	0	17,902	3.24
03/12/2020	5,035	1,471	17,979	0	0	17,979	3.24
03/13/2020	3,355	980	15,042	0	0	15,042	3.24
03/14/2020	3,255	943	0	0	0	0	3.24
03/15/2020	3,129	907	0	0	0	0	3.24
03/16/2020	3,070	897	53,515	0	0	53,515	3.25
03/17/2020	2,667	779	10,959	0	0	10,959	3.25
03/18/2020	FLOOD STAGE	MAXIMUM	12,253	0	0	12,253	3.40
03/19/2020	FLOOD STAGE	MAXIMUM	10,230	0	0	10,230	3.40
03/20/2020	FLOOD STAGE	MAXIMUM	14,294	0	0	14,294	3.45
03/21/2020	FLOOD STAGE	MAXIMUM	0	0	0	0	3.45
03/22/2020	FLOOD STAGE	MAXIMUM	0	0	0	0	3.45
03/23/2020	FLOOD STAGE	MAXIMUM	44,777	0	0	44,777	3.45
03/24/2020	FLOOD STAGE	MAXIMUM	13,192	0	0	13,192	3.70
03/25/2020	FLOOD STAGE	MAXIMUM	16,873	0	0	16,873	3.70
03/26/2020	FLOOD STAGE	MAXIMUM	5,758	0	0	5,758	3.69
03/27/2020	16,299	4,762	15,236	0	0	15,236	3.68
03/28/2020	13,268	3,847	0	0	0	0	3.68
03/29/2020	11,357	3,293	0	0	0	0	3.67
03/30/2020	9,776	2,856	43,744	0	0	43,744	3.85

DATE	Harrison Bayou Flow (gpm)	Maximim 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)
03/31/2020	FLOOD STAGE	MAXIMUM	14,245	0	0	14,245	4.00
TOTALS			**1,188,795**	**1,857,137**	**0**	**3,045,932**	

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

Table 5. Monthly Groundwater Extraction Quantities – January through March 2020

ICT or Well Number	January 2020 (gallons)	February 2020 (gallons)	March 2020 (gallons)	Total
1	0	0	0	0
2	0	0	0	0
3	0	0	0	0
4	35,270	62,106	26,386	123,762
5	0	0	0	0
EW-01	0	0	70	70
7	10,142	21,087	21,025	52,254
8	49,004	49,082	103,532	201,618
18WW17	8,794	10,570	14,107	33,471
10	0	0	0	0
11	49,956	64,672	24,247	138,875
12A	3,872	5,535	7,181	16,588
12B	19,477	29,428	35,812	84,717
12C	22,088	9,922	44,757	76,767
12D	338	760	0	1,098
12E	19,002	31,630	40,010	90,642
13A	19,935	40,312	52,542	112,789
13B	0	0	0	0
13C	0	0	0	0
13D	45	155	159	359
13E	272	315	302	889
13F	638	3,624	3,052	7,314
14A	279	398	600	1,277
14B	406	643	530	1,579
14C	50,588	24,794	56,940	132,322
14D	43,712	66,373	88,160	198,245
14E	0	0	0	0
LHAAP-18/24 Total	***333,818***	***421,406***	***519,412***	***1,274,636***
Site 16				0
LHAAP-16 Total	***0***	***0***	***0***	***0***
	333,818	***421,406***	***519,412***	***1,274,636***

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Table 6. Weekly Perchlorate Sample Results

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_010720/BIX	HS20010261	1/7/2020	TK-650	589	17	4	NA	**2.0**	J	Yes	**0.79**	**0.171**	**2.01**
LH18/24-SP650_010720_BIX (monthly)	HS20010259	1/7/2020	TK-650	589	17	4	NA	**2.0**	J	Yes	--	--	--
LH18/24-SP140_010720 (monthly)	HS20010258	1/7/2020	TK-140	--	--	NA	**13,000**	NA		NA	--	--	--
LH18/24-SP650_012320/BIX	HS20011091	1/23/2020	TK-650	589	17	4	NA	**0.136**		Yes	**9.1**	**1.96**	**2.02**
LH18/24-SP650_012820/BIX	HS20011311	1/28/2020	TK-650	589	17	4	NA	**0.322**		Yes	**0.21**	< 0.0250 U	**2.2**
LH18/24-SP650_020420/BIX	HS20020147	2/4/2020	TK-650	589	17	4	NA	**0.14**		Yes	**4.7**	**1.06**	**2.44**
LH18/24-SP650_021120/BIX	HS20020473	2/11/2020	TK-650	589	17	4	NA	< 2.0	U	Yes	**3.6**	**0.97**	**1.66**
LH18/24-SP650_021120_BIX (monthly)	HS20020474	2/11/2020	TK-650	589	17	4	NA	< 2.0	U	Yes	--	--	--
LH18/24-SP140_021120 (monthly)	HS20020472	2/11/2020	TK-140	--	--	NA	**11,000**	NA		NA	--	--	--
LH18/24-SP650_021920/BIX	HS20020832	2/19/2020	TK-650	589	17	4	NA	< 2.0	U	Yes	**3.7**	**0.486**	**1.71**
LH18/24-SP650_022520/BIX	HS20021115	2/25/2020	TK-650	589	17	4	NA	**0.161**		Yes	< 0.10 U	**0.0110 J**	**1.3**
LH18/24-SP650_022520_BIX (quarterly)	HS20021120	2/25/2020	TK-650	589	17	4	NA	**0.0969**	J	Yes	--	--	--
LH18/24-SP140_022520 (quarterly)	HS20021121	2/25/2020	TK-140	--	--	NA	**10,400**	NA		NA	--	--	--
LH18/24-SP650_030420/BIX	HS20030169	3/4/2020	TK-650	589	17	4	NA	< 0.0500	U	Yes	**4.7**	**2.16**	**1.78**
LH18/24-SP650_031020/BIX (monthly)	HS20030425	3/10/2020	TK-650	589	17	4	NA	< 0.0500	U	Yes	--	--	--
LH18/24-SP140_031020 (monthly)	HS20030427	3/10/2020	TK-140	--	--	NA	**14,000**	NA		NA	--	--	--
LH18/24-SP650_031020/BIX	HS20030430	3/10/2020	TK-650	589	17	4	NA	< 0.0500	U	Yes	**6.6**	**1.45**	**2.31**
LH18/24-SP650_031720/BIX	HS20030840	3/17/2020	TK-650	589	17	4	NA	< 0.0500	U	Yes	**0.35**	< 0.0250 U	**2.07**
LH18/24-SP650_032420/BIX	HS20031081	3/24/2020	TK-650	589	17	4	NA	**0.0720**	J	Yes	**2.2**	**0.461**	**1.97**
LH18/24-SP650_033120/BIX	HS20040018	3/31/2020	TK-650	589	17	4	NA	< 0.0500	U	Yes	**7.8**	**2.26**	**2.92**

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

Table 7. Bi-Weekly GWTP Analytical Sampling Results for January 2020

	Effluent Limitation for Discharge (µg/L) per Table 2 of ROD			Sample Location	EFFLUENT - Monthly		INFLUENT - Monthly*		EFFLUENT - Biweekly		EFFLUENT - Biweekly		Does Concentration Meet Effluent Discharge Limits? (Yes/No)
				Sample Identification	LH18/24-SP650_010720/BIX		LH18/24-SP140_010720		LH18/24-SP650_012320		LH18/24-SP650_012820		
				Lab Package	HS20010259		HS20010258		HS20011089		HS20011312		
				Sample Date	1/7/2020		1/7/2020		1/23/2020		1/28/2020		
				Sample Type	GRAB		GRAB		GRAB		GRAB		
	Daily Average Concentration	Daily Maximum Concentration	INF Pond MCL	Result	DVQ	Result	DVQ	Result	DVQ	Result	DVQ	
VOLATILES	**µg/L**	**µg/L**	**µg/L**	**µg/L**		**µg/L**		**µg/L**		**µg/L**		
1,1,1-Trichloroethane	3,417	7,230	200	0.5	U	NA		0.5	U	0.5	U	Yes
1,1,2-Trichloroethane	102.5	216.9	5	0.5	U	NA		0.5	U	0.5	U	Yes
1,1-Dichloroethane	6,633	14,032	NV	0.5	U	NA		0.5	U	0.5	U	Yes
1,1-Dichloroethene	119	253	7	0.5	U	NA		0.5	U	0.5	U	Yes
1,2-Dichloroethane	85	181	5	**1.5**		NA		**1.2**		**1.3**		Yes
1,2-Dichloropropane	NA	NA	5	0.5	U	NA		0.5	U	0.5	U	Yes
Acetone	1,132	2,395	NV	1.0	U	NA		1.0	U	1.0	U	Yes
Benzene	85	181	5	0.5	U	NA		0.5	U	0.5	U	Yes
Carbon Tetrachloride	85	181	5	0.5	U	NA		0.5	U	0.5	U	Yes
Chlorobenzene	22,300	47,180	100	0.5	U	NA		0.5	U	0.5	U	Yes
Chloroform	1,708	3,615	NV	0.5	U	NA		0.5	U	0.5	U	Yes
cis-1,2-Dichloroethene	NV	NV	70	**29**		NA		**23**		**27**		Yes
Ethylbenzene	26,954	57,025	700	0.5	U	NA		0.5	U	0.5	U	Yes
m,p-Xylenes	39.5	83.6	NV	1.0	U	NA		1.0	U	1.0	U	Yes
Methylene Chloride	803	1,699	5	1.0	U	NA		1.0	U	1.0	U	Yes
o-Xylene	39.5	83.6	NV	0.5	U	NA		0.5	U	0.5	U	Yes
Styrene	2,829	5,987	100	0.5	U	NA		0.5	U	0.5	U	Yes
Tetrachloroethene	85.4	180.7	5	0.5	U	NA		0.5	U	0.5	U	Yes
Toluene	1,980	4,189	10	0.5	U	NA		0.5	U	0.5	U	Yes
Trichloroethene	85	181	5	**5.0**		NA		**3.7**		**5.0**		Yes
Vinyl Chloride	34	72	2	0.5	U	NA		0.5	U	0.5	U	Yes
ANIONS	**mg/L**	**mg/L**	**mg/L**	**mg/L**		**mg/L**		**mg/L**		**mg/L**		
Chloride	NV	NV	NV	NA		NA		**463**		NA		NA
Sulfate	NV	NV	NV	NA		NA		**29.7**		NA		NA
PERCHLORATE	**µg/L**	**µg/L**	**µg/L**	**µg/L**		**µg/L**		**µg/L**		**µg/L**		
Perchlorate	278	589	17	**2.0**	J	**13,000**		NA		NA		Yes
METALS	**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		Yes
Barium	1	2	2	**0.0666**		NA		NA		NA		Yes
Lead	0.0022	0.0046	0.015	< 0.00100	U	NA		NA		NA		Yes
Selenium	0.0057	0.0120	0.05	< 0.00250	U	< 0.00250	U	NA		NA		Yes
Silver	0.0014	0.0030	0.1	< 0.000500	U	< 0.000500	U	NA		NA		Yes
SEMI-VOLATILES	**µg/L**	**µg/L**	**µg/L**	**µg/L**		**µg/L**		**µg/L**		**µg/L**		
1,4-Dioxane	NV	134.2	NV	**18**		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
BIX - Before ion exchange
MCL - Maximum Contaminant Level
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
Influent sample not compared to discharge limits
NV - no value
Calculated Effluent Limit
No exceedances; all effluent released to Harrison Bayou in January 2020
UB - considered an artifact of blank contamination

Table 8. Bi-Weekly GWTP Analytical Sampling Results for February 2020

	Effluent Limitation for Discharge (µg/L) per Table 2 of ROD			EFFLUENT - Biweekly		EFFLUENT - Monthly		INFLUENT - Monthly*		EFFLUENT - Biweekly		Does Concentration Meet Effluent Discharge Limits? (Yes/No)
Sample Location				EFFLUENT - Biweekly		EFFLUENT - Monthly		INFLUENT - Monthly*		EFFLUENT - Biweekly		
Sample Identification				LH18/24-SP650_020420		LH18/24-SP650_021120/BIX		LH18/24-SP140_021120		LH18/24-SP650_021920		
Lab Package				HS20020146		HS20020474		HS20020472		HS20020835		
Sample Date				2/4/2020		2/11/2020		2/11/2020		2/19/2020		
Sample Type				GRAB		GRAB		GRAB		GRAB		
	Daily Average Concentration	Daily Maximum Concentration	INF Pond MCL	Result	DVQ	Result	DVQ	Result	DVQ	Result	DVQ	
VOLATILES	**µg/L**	**µg/L**	**µg/L**	**µg/L**		**µg/L**		**µg/L**		**µg/L**		
1,1,1-Trichloroethane	3,417	7,230	200	0.50	U	0.50	U	NA		0.50	U	Yes
1,1,2-Trichloroethane	102.5	216.9	5	0.50	U	0.50	U	NA		0.50	U	Yes
1,1-Dichloroethane	6,633	14,032	NV	0.50	U	0.50	U	NA		0.50	U	Yes
1,1-Dichloroethene	119	253	7	0.50	U	0.50	U	NA		0.50	U	Yes
1,2-Dichloroethane	85	181	5	**1.4**		**1.3**		NA		**1.3**		Yes
1,2-Dichloropropane	NA	NA	5	0.50	U	0.50	U	NA		0.50	U	Yes
Acetone	1,132	2,395	NV	1.0	U	1.0	U	NA		1.0	U	Yes
Benzene	85	181	5	0.50	U	0.50	U	NA		0.50	U	Yes
Carbon Tetrachloride	85	181	5	0.50	U	0.50	U	NA		0.50	U	Yes
Chlorobezene	22,300	47,180	100	0.50	U	0.50	U	NA		0.50	U	Yes
Chloroform	1,708	3,615	NV	0.50	U	0.50	U	NA		0.50	U	Yes
cis-1,2-Dichloroethene	NV	NV	70	**28**		**25**		NA		**24**		Yes
Ethylbenzene	26,954	57,025	700	0.50	U	0.50	U	NA		0.50	U	Yes
m,p-Xylenes	39.5	83.6	NV	1.0	U	1.0	U	NA		1.0	U	Yes
Methylene Chloride	803	1,699	5	1.0	U	1.0	U	NA		**1.1**	J	Yes
o-Xylene	39.5	83.6	NV	0.50	U	0.50	U	NA		0.50	U	Yes
Styrene	2,829	5,987	100	0.50	U	0.50	U	NA		0.50	U	Yes
Tetrachloroethene	85.4	180.7	5	0.50	U	0.50	U	NA		0.50	U	Yes
Toluene	1,980	4,189	10	0.50	U	0.50	U	NA		0.50	U	Yes
Trichloroethene	85	181	5	**5.6**		**5.1**		NA		**5.0**		Yes
Vinyl Chloride	34	72	2	0.50	UJ	0.50	U	NA		0.50	UJ	Yes
ANIONS	**mg/L**	**mg/L**	**mg/L**	**mg/L**		**mg/L**		**mg/L**		**mg/L**		
Chloride	NV	NV	NV	**501**		NA		NA		**447**		NA
Sulfate	NV	NV	NV	**25.8**		NA		NA		**23.3**		NA
PERCHLORATE	**µg/L**	**µg/L**	**µg/L**	**µg/L**		**µg/L**		**µg/L**		**µg/L**		
Perchlorate	278	589	17	NA		< 2.0	U	**11,000**		NA		Yes
METALS	**mg/L**	**mg/L**	**mg/L**	**mg/L**		**mg/L**		**mg/L**		**mg/L**		
Hexavalent Chromium	0.058	0.124	NV	NA		< 0.0100	UJ	< 0.0100	U	NA		Yes
Barium	1	2	2	NA		**0.304**		NA		NA		Yes
Lead	0.0022	0.0046	0.015	NA		< 0.00100	U	NA		NA		Yes
Selenium	0.0057	0.0120	0.05	NA		< 0.00250	U	< 0.00250	U	NA		Yes
Silver	0.0014	0.0030	0.1	NA		< 0.000500	U	**0.000314**	J	NA		Yes
SEMI-VOLATILES	**µg/L**	**µg/L**	**µg/L**	**µg/L**		**µg/L**		**µg/L**		**µg/L**		
1,4-Dioxane	NV	134.2	NV	NA		**24**		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
BIX - Before ion exchange
MCL - Maximum Contaminant Level
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
Influent sample not compared to discharge limits
NV - no value

Table 9. Bi-Weekly Analytical GWTP Sampling Results for March 2020

			Sample Location	EFFLUENT - Biweekly		INFLUENT - Monthly*		EFFLUENT - Monthly		EFFLUENT - Biweekly		EFFLUENT - Biweekly		EFFLUENT - Biweekly		Does Concentration Meet Effluent Discharge Limits? (Yes/No)
			Sample Identification	LH18/24-SP650_030420		LH18/24-SP140_031020		LH18/24-SP650_031020		LH18/24-SP650_031720		LH18/24-SP650-032420		LH18/24-SP650_033120		
			Lab Package	HS20030172		HS20030427		HS20030425		HS20030838		HS20031080		HS20040019		
			Sample Date	3/4/2020		3/10/2020		3/10/2020		3/17/2020		3/24/2020		3/31/2020		
			Sample Type	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	< 0.5	U	NA		< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	Yes
1,1,2-Trichloroethane	102.5	216.9	5	< 0.5	U	NA		< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	Yes
1,1-Dichloroethane	6,633	14,032	NV	< 0.5	U	NA		< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	Yes
1,1-Dichloroethene	119	253	7	< 0.5	U	NA		< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	Yes
1,2-Dichloroethane	85	181	5	**1.2**		NA		**1.2**		**1.2**		**1.0**		**1.0**		Yes
1,2-Dichloropropane	NA	NA	5	< 0.5	U	NA		< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	Yes
Acetone	1,132	2,395	NV	< 1.0	U	NA		< 1.0	U	< 1.0	U	< 2.0	U	< 2.0	U	Yes
Benzene	85	181	5	< 0.5	U	NA		< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	Yes
Carbon Tetrachloride	85	181	5	< 0.5	U	NA		< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	Yes
Chlorobenzene	22,300	47,180	100	< 0.5	U	NA		< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	Yes
Chloroform	1,708	3,615	NV	< 0.5	U	NA		< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	Yes
cis-1,2-Dichloroethene	NV	NV	70	**27**		NA		**27**		**27**		**26**		**22**		Yes
Ethylbenzene	26,954	57,025	700	< 0.5	U	NA		< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	Yes
m,p-Xylenes	39.5	83.6	NV	< 1.0	U	NA		< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	Yes
Methylene Chloride	803	1,699	5	< 1.0	U	NA		< 1.0	U	< 1.0	U	< 0.5	U	< 0.5	U	Yes
o-Xylene	39.5	83.6	NV	< 0.5	U	NA		< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	Yes
Styrene	2,829	5,987	100	< 0.5	U	NA		< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	Yes
Tetrachloroethene	85.4	180.7	5	< 0.5	U	NA		< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	Yes
Toluene	1,980	4,189	10	< 0.5	U	NA		< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	Yes
Trichloroethene	85	181	5	**5.1**		NA		**5.0**		**5.0**		**5.4**		**4.0**		Yes
Vinyl Chloride	34	72	2	< 0.5	U	NA		< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	Yes
ANIONS	mg/L	mg/L	mg/L	mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		
Chloride	NV	NV	NV	**376.0**		NA		NA		**363**		NA		**326**		NA
Sulfate	NV	NV	NV	**28.5**		NA		NA		**32.8**		NA		**29**		NA
PERCHLORATE	µg/L	µg/L	µg/L	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		
Perchlorate	278	589	17	NA		**14,000**		< 0.0500	U	NA		NA		NA		Yes
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	NA		**0.00900**	J	< 0.0100	U	NA		NA		NA		Yes
Barium	1	2	2	NA		NA		**0.115**		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		< 0.00250	U	< 0.00250	U	NA		NA		NA		Yes
Silver	0.0014	0.0030	0.1	NA		< 0.000500	U	< 0.000500	U	NA		NA		NA		Yes
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		NA		**29**		NA		NA		NA		Yes

Notes:
µg/L - micrograms per liter
mg/L - milligrams per liter
DVQ - data validation qualifier
GWTP - Groundwater Treatment Plant
MCL - Maximum Contaminant Level
U - Non detect reported to the limit of detection
J - estimated concentration between the detection limit and limit of quantitation and/or due to quality control discrepancy
Influent sample not compared to discharge limits
Calculated Effluent Limit
Grab samples are compared to the daily maximum and composite samples to the daily average.
ROD - Record of Decision
NA - not applicable or not analyzed
No exceedances; all effluent released to Harrison Bayou in March 2020

Table 10. Quarterly GWTP Analytical Sampling Results

			Sample Location	EFFLUENT		INFLUENT*		Does Concentration Meet Discharge Limits? (Yes/No)
			Sample Identification	LH18/24-SP650_022520/BIX		LH18/24-SP140_022520		
			Lab Package	HS20021120		HS20021121		
			Sample Date	2/25/2020		2/25/2020		
			Sample Type	GRAB		GRAB		
	Effluent Limitation for Discharge (µg/L) per Protocol							
	Daily Average Concentration	Daily Maximum Concentration	Reporting Limit	Result	DVQ	Result	DVQ	
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	< 10	U	Yes
1,1-Dichloroethene	119	253	1	< 0.5	U	< 10	U	Yes
1,2-Dichloroethane	85	181	1	**1.2**		**39**	J	Yes
1,2-Dichloropropane	NA	NA	1	< 0.5	U	< 10	U	Yes
Acetone	1,132	2,395	2	< 1.0	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	< 1.0	UJ	**2,200**	J	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	**52**	J	Yes
Toluene	1,980	4,189	1	< 0.5	U	< 10	U	Yes
Trichloroethene	85	181	1	**4.9**		**4,900**		Yes
Vinyl Chloride	34	72	1	< 0.5	U	**68**	J	Yes
ANIONS	**mg/L**	**mg/L**	**mg/L**	**mg/L**		**mg/L**		
Chloride	NA	NA	10	**386**		**357**		NA
Sulfate	NA	NA	10	**24**		**26**		NA
PERCHLORATE	**µg/L**	**µg/L**	**µg/L**	**µg/L**		**µg/L**		
Perchlorate	278	589	4	**0.0969**	J	**10,400**		Yes
METALS	**mg/L**	**mg/L**	**mg/L**	**mg/L**		**mg/L**		
Aluminum	0.777	1.644	0.0100	**0.175**		**0.301**		Yes
Antimony	NA	NA	0.00200	**0.000607**	J	**0.00262**	J	NA
Arsenic	0.365	0.772	0.00200	**0.000698**	J	**0.000888**	J	Yes

Table 10. Quarterly GWTP Analytical Sampling Results

			Sample Location	EFFLUENT		INFLUENT*		Does Concentration Meet Discharge Limits? (Yes/No)
			Sample Identification	LH18/24-SP650_022520/BIX		LH18/24-SP140_022520		
			Lab Package	HS20021120		HS20021121		
			Sample Date	2/25/2020		2/25/2020		
			Sample Type	GRAB		GRAB		
	Effluent Limitation for Discharge (µg/L) per Protocol							
	Daily Average Concentration	Daily Maximum Concentration	Reporting Limit	Result	DVQ	Result	DVQ	
Barium	1	2	0.00400	**0.197**	J	**0.579**		Yes
Beryllium	NA	NA	0.00200	< 0.000500	U	**0.000206**	J	NA
Cadmium	0.0016	0.0034	0.00200	**0.000317**	J	**0.000947**	J	Yes
Calcium	NA	NA	0.500	**15.8**		**42.4**		NA
Chromium	0.355	0.752	0.00400	**0.0159**		**0.0170**		Yes
Cobalt	5.433	11.495	0.00500	**0.00231**	J	**0.00827**		Yes
Iron	1.132	2.395	0.200	**0.716**		**0.829**		Yes
Lead	0.0022	0.0046	0.00200	< 0.00100	U	< 0.00100	U	Yes
Magnesium	NA	NA	0.200	**19.2**		**25.9**		NA
Manganese	7.323	15.494	0.00500	**0.149**		**0.520**		Yes
Nickel	0.087	0.184	0.00200	**0.0136**		**0.0385**		Yes
Potassium	NA	NA	0.200	**1.38**		**1.18**		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	**314**		**176**		NA
Thallium	NA	NA	0.00200	**0.000428**	J	< 0.000500	U	NA
Vanadium	1.698	3.592	0.00500	< 0.00100	U	< 0.00100	U	Yes
Zinc	0.146	0.31	0.00400	**0.282**		**0.689**		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	**0.39**		**0.45**		Yes
CHEMICAL OXYGEN DEMAND (COD)	**mg/L**	**mg/L**	**mg/L**	**mg/L**		**mg/L**		
COD	NA	200	75	**10**	J	**5.0**	J	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
UJ - estimated non-detect due to quality control issues and reported to the limit of detection
mg/L - milligrams per liter
NA - not applicable
GWTP - Groundwater Treatment Plant

3 QUALITY CONTROL

This report summarizes the data for samples collected during January, February, and March 2020. 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 1st quarter of 2020 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 E**. The laboratory reports for the 1st quarter of 2020 are included in **Appendix C** on a CD. Air monitoring data is presented in **Appendix F, Attachment 3**.

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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 in accordance with the Protocol for Discharging GWTP Effluent (**Appendix D**). **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 1st quarter of 2020. Approximately 344,213 gallons of treated groundwater was discharged from the GWTP to the Harrison Bayou in January 2020, 424,639 gallons in February 2020, and 419,943 gallons in March 2020. In January 2020, 1,115,183 gallons were discharged from the INF Pond to the Harrison Bayou, along with 741,954 gallons in February 2020. No treated groundwater was discharged from the INF Pond in March due to the continuous flow of the Harrison Bayou.

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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 receptor[1]. 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 F** (**Tables 1 through 3**) includes a summary of analytical results and PID readings, calculations of emission rates from the emission point, 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, 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

[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.

are used to calculate emission rates in pounds 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 1st Quarter 2020

During the 1st quarter of 2020, air sampling was completed on February 24 and 25, 2020. A summary of the air sampling results is presented in **Appendix F**. All results met the criteria described in Section 6.1.

5.2.1 Summa Canister Monitoring Results

The sampling event was conducted on February 24 and 25, 2020, for presentation during the 1st Quarter 2020 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

Methylene chloride; cis-1,2-dichloroethene; trichloroethene; dichlorodifluoromethane; trichlorofluoromethane; trichlorotrifluoroethane; and n-hexane were detected in February 2020 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 n-hexane; dichlorodifluoromethane; and trichlorofluoromethane; with similar concentrations in both GWTP ambient air and downwind ambient air are suspected to be 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 F**.

5.2.1.2 Air Stripper Effluent Results

The VOCs present in groundwater that are removed via the air stripper include 1,2-dichloroethane; 1,1-dichloroethene; acetone; chloroform; cis-1,2-dichloroethene; methylene chloride; tetrachloroethene; trans-1,2-dichloroethene; trichloroethene; vinyl chloride; and trichlorotrifluoroethane. 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.

All air stripper effluent concentrations were below the emission criteria, as presented in **Table 2** within **Appendix F**.

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. Ambient air PID measurements during this quarter at the GWTP were reported at 0.0 parts per million. The stripper PID location detected between 20.2 and 25.2 parts per million at each sampling event. The results of the PID readings collected during GWTP operations are presented in **Table 3** in **Attachment 2** within **Appendix F**.

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6 COMMENTS AND RESPONSES

The 4th quarter 2019 GWTP report was provided to the regulators on 21 April 2020. The following comments were received from the TCEQ on 7 May 2020:

TCEQ Comment 1: [Page] VII – Please revise this sentence so it is clear the injections are part of the Remedial Action: "In September 2019, injections were implemented at LHAAP-16." Maybe match the language in 2.3.

> **Response to TCEQ Comment 1:** The text within the Executive Summary referenced in the TCEQ comment will be revised to state: "Groundwater is no longer extracted from LHAAP-16 because injections were completed as part of the final remedial action, which commenced in September 2019. The only groundwater treated and discussed within this report is from LHAAP-18/24".

TCEQ Comment 2: Section 1, 1-1 – Last paragraph, please update since plant is no longer receiving flow from 16 due to remedy implementation.

> **Response to TCEQ Comment 2:** The text in Section 1 will be revised to state: "The GWTP no longer receives flow from LHAAP-16 due to injections completed as a part of the final remedy implementation, which commenced in September 2019. The GWTP had previously received flow from eight extraction wells installed at LHAAP-16 as part of a historic treatability study. The extraction wells were installed in 1996 and 1997".

The USEPA made notification that there were no comments on 20 May 2020.

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APPENDIX A
ICT LAYOUT AND GWTP PROCESS FLOW DIAGRAM

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0 100 200 400 Feet

Harrison Bayou

ICT-13G
ICT-13F
ICT-13E
ICT-13D
ICT-13C
ICT-13B
ICT-13A
ICT-12E
ICT-12D
ICT-12C
ICT-12B
ICT-12A
ICT-14A
ICT-14B
ICT-14C
ICT-14D
ICT-14E
ICT-7
ICT-5
ICT-6
ICT-1
ICT-2
ICT-3
ICT-4
ICT-8
ICT-9
ICT-10
ICT-11
EW-1

LHAAP-24
LHAAP-18
LHAAP-39
LHAAP-17

18WW17

Open Burning Pan 157
Open Burning Cage 155

33-X
35-X
37-X
41-X
21-X
27-X
22-X
22-X-1
20-X
24-X
25-X

Groundwater Treatment Plant

Ditch

AVE "Q"
SCUDDAY AVE
LONG POINT RD

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
- 401 Building Number
- 717 Former Building Location and Number

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Groundwater Treatment Plant
Longhorn Army Ammunition Plant, Karnack, Texas

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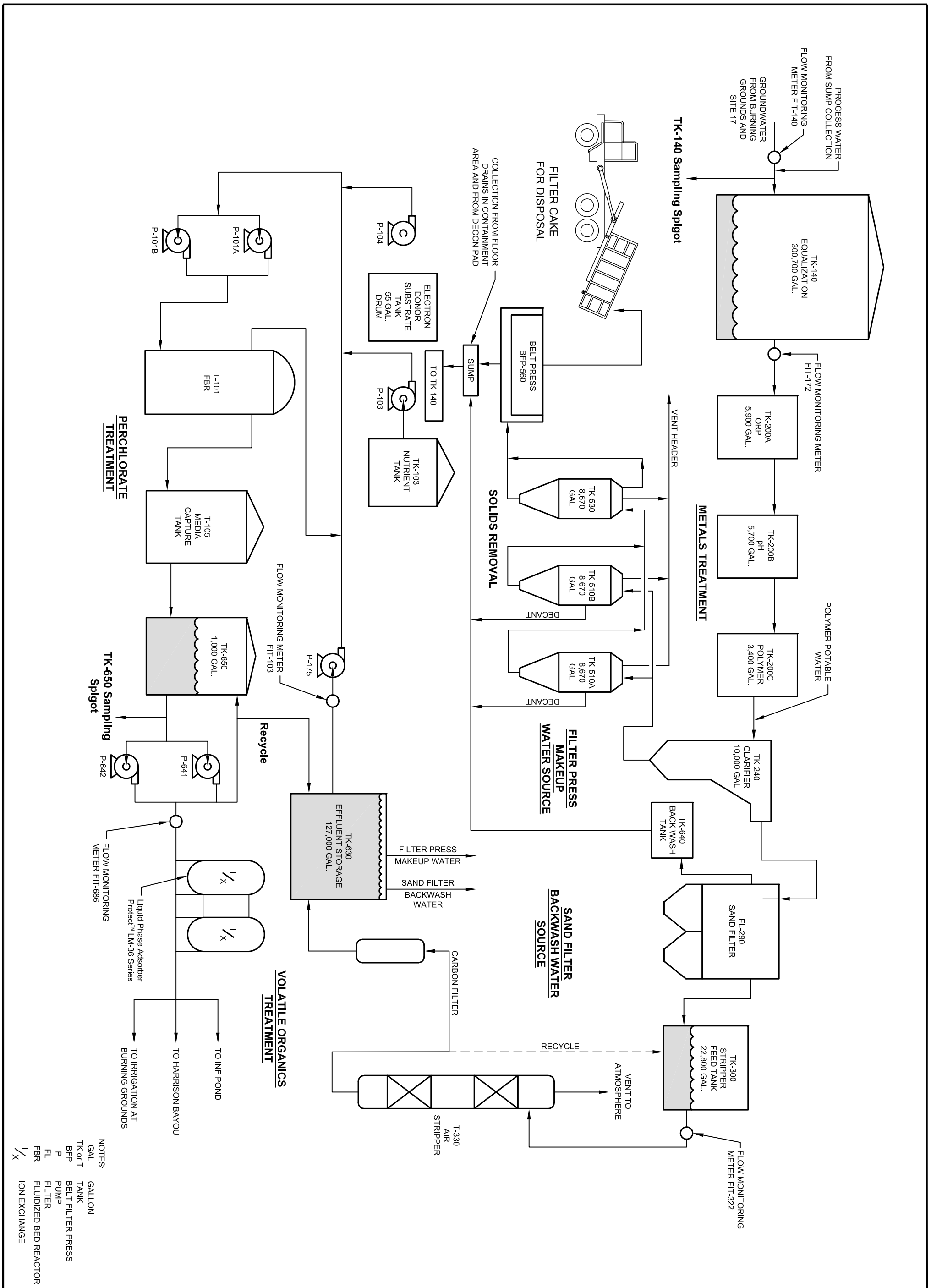
ICT Layout Map

Figure A-1

00968337



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Process Flow Diagram

Figure A-2

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.

APPENDIX B
GROUNDWATER ELEVATION CONTOUR MAPS

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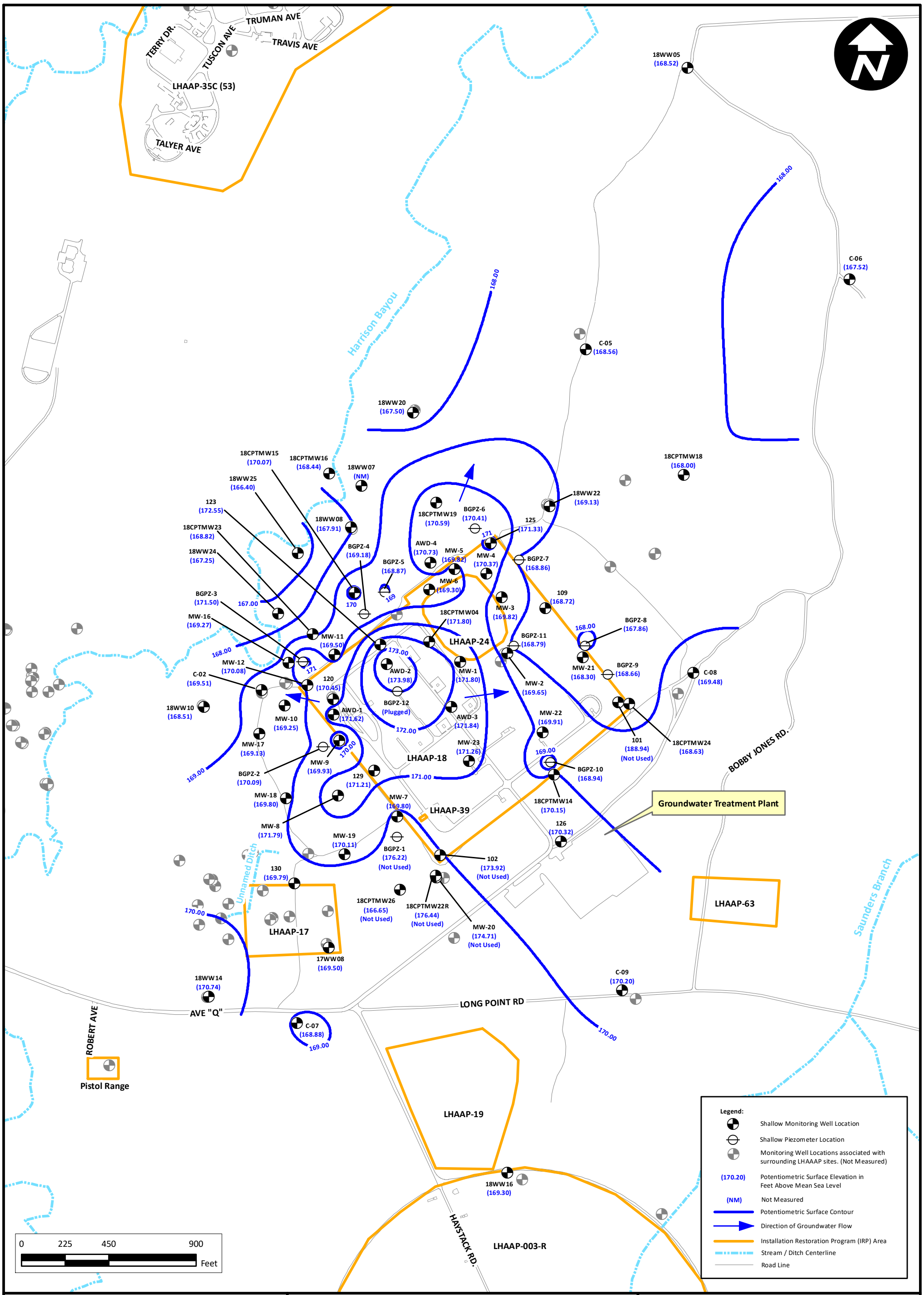

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Longhorn Army Ammunition Plant, Karnack, Texas

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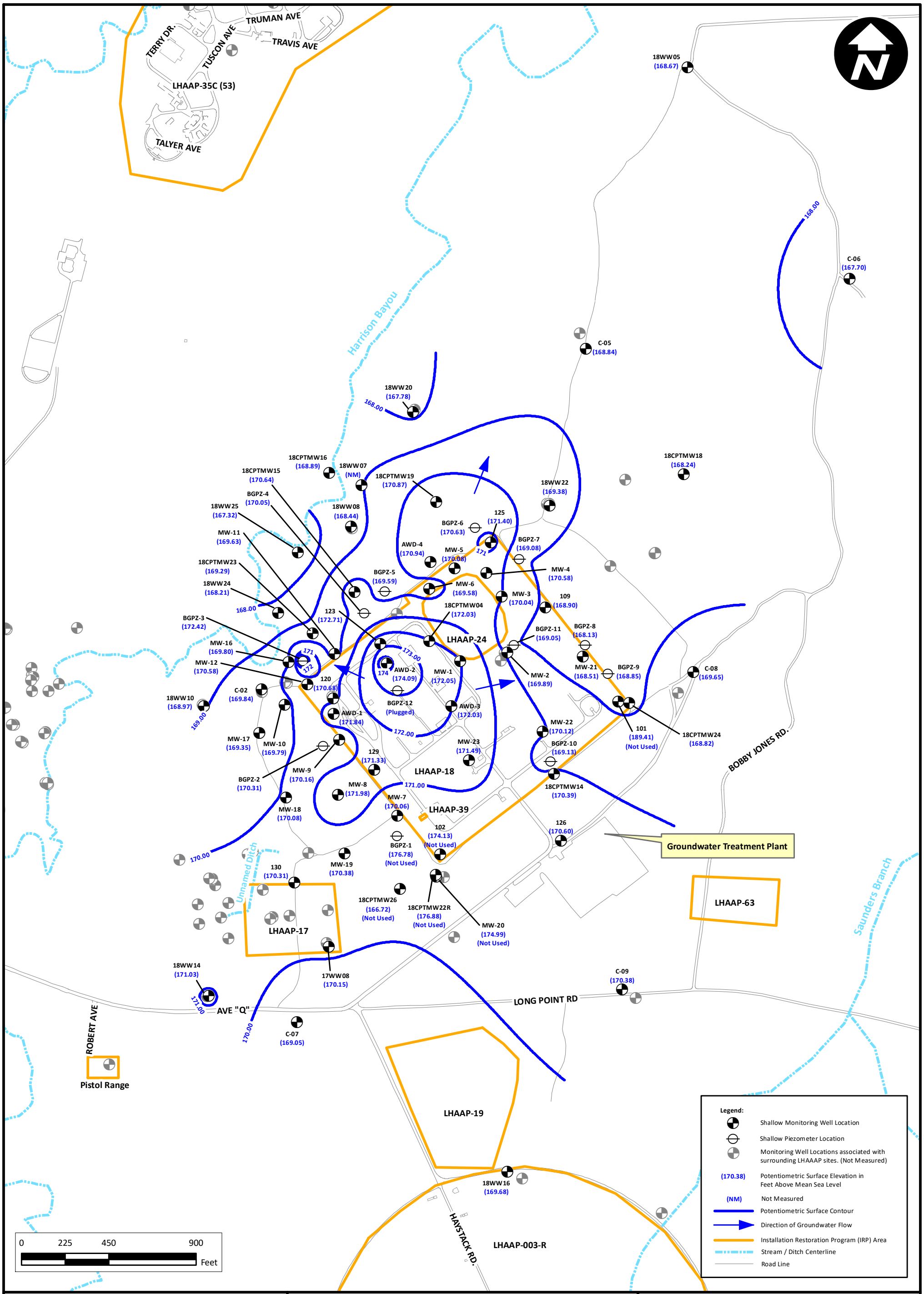
Groundwater Potentiometric Surface Map
Shallow Zone (January 31, 2020) LHAAP-18/24

Figure B-1



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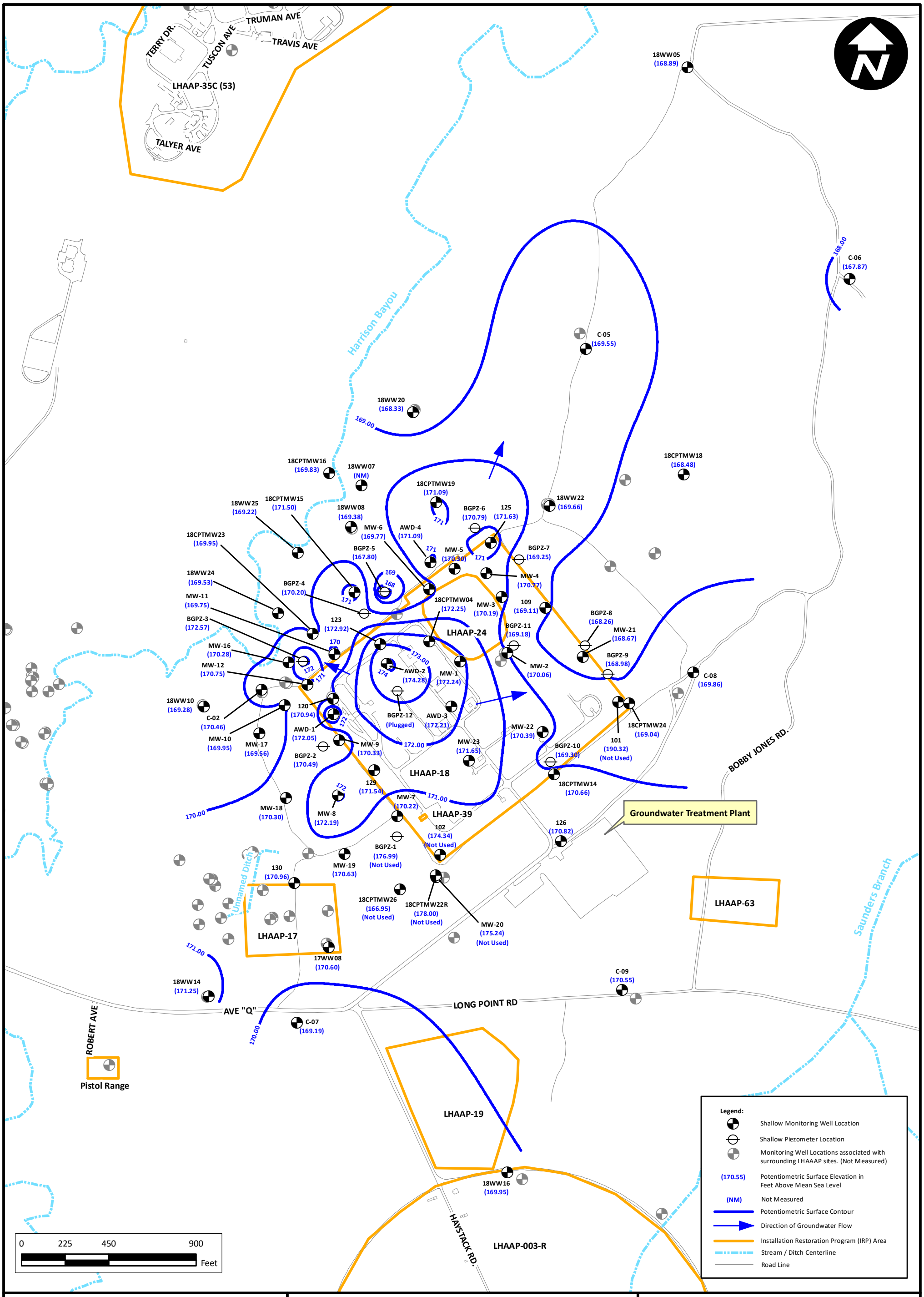
Groundwater Potentiometric Surface Map
Shallow Zone (February 25, 2020) LHAAP-18/24

Figure B-2



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Groundwater Potentiometric Surface Map
Shallow Zone (March 31, 2020) LHAAP-18/24

Figure B-3

TALYER AVE
LHAAP-35C (53)
Harrison Bayou
18WW04 (167.83)
18WW19 (167.46)
18CPTMW19SW (169.20)
18CPTMW08SW (169.47)
18WW09 (167.31)
18WW21 (169.14)
C-04A (170.46)
C-04 (170.17)
18CPTMW08DW (169.22)
C-03 (169.47)
18WW18 (169.51)
18CPTMW23SW (168.48)
LHAAP-24
18WW02 (169.60) (Not Used)
MW-14 (172.68)
18CPTMW04SW (169.36)
18CPTMW01SW (170.44) (Not Used)
18CPTMW07 (169.45)
18WW06 (169.19)
MW-13 (169.27)
18CPTMW01DW (169.50)
18WW11 (168.20)
18WW03 (168.82)
LHAAP-18
18CPTMW06 (169.27)
18CPTMW03SW (169.27)
BOBBY JONES RD.
18CPTMW10DW (169.48) (Not Used)
18CPTMW10SW (169.56)
18CPTMW12SW (169.61)
LHAAP-39
Groundwater Treatment Plant
18CPTMW12DW (169.70)
Unnamed Ditch
18CPTMW26SW (169.20)
18CPTMW22SW (169.39)
LHAAP-63
Saunders Branch
LHAAP-17
18CPTMW22DW (168.63) (Not Used)
C-01 (169.73)
18WW15 (170.94)
LONG POINT RD
AVE "Q"
C-10 (170.16)
ROBERT AVE
Pistol Range
LHAAP-19
18WW01 (170.14)
HAYSTACK RD.
LHAAP-003-R
167.50
168.00
168.50
169.00
169.50
170.00
170.50
171.00
171.50
172
169.50
170.00
169.00
170.00
170.50

0 225 450 900 Feet

Legend:
- Wilcox Zone Monitoring Well Location
- Monitoring Well Locations associated with surrounding LHAAAP sites. (Not Measured)
- (170.16) Potentiometric Surface Elevation in Feet Above Mean Sea Level
- Potentiometric Surface Contour
- Direction of Groundwater Flow
- Installation Restoration Program (IRP) Area
- Stream / Ditch Centerline
- Road Line

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Groundwater Treatment Plant
Longhorn Army Ammunition Plant, Karnack, Texas

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Groundwater Potentiometric Surface Map
Wilcox Zone (January 31, 2020) LHAAP-18/24

Figure B-4

TALYER AVE
LHAAP-35C (53)
Harrison Bayou
18WW04 (168.00)
18WW19 (167.74)
18CPTMW19SW (167.44)
18WW21 (169.25)
167.50
18CPTMW08SW (169.68)
C-04 (170.41)
C-04A (170.67)
18WW09 (167.82)
168.00
170.00
18WW18 (169.72)
C-03 (169.69)
18CPTMW23SW (169.03)
18CPTMW08DW (169.47)
MW-14 (172.90)
LHAAP-24
18WW02 (170.01) (Not Used)
168.50
169.50
18CPTMW04SW (169.70)
18CPTMW01SW (170.68) (Not Used)
18CPTMW07 (169.71)
18WW06 (169.74)
MW-13 (169.63)
18CPTMW01DW (169.74)
18WW03 (169.08)
18WW11 (168.68)
172.00
171.50
171.00
170.50
170.00
169.00
169.50
18CPTMW03SW (169.45)
LHAAP-18
18CPTMW06 (169.52)
BOBBY JONES RD.
18CPTMW10DW (169.73)
18CPTMW10SW (169.78)
18CPTMW12SW (169.84)
LHAAP-39
18CPTMW12DW (169.92)
Groundwater Treatment Plant
170.00
Unnamed Ditch
169.50
18CPTMW22SW (169.61)
18CPTMW26SW (169.45)
LHAAP-63
Saunders Branch
170.50
C-01 (169.93)
18CPTMW22DW (168.90) (Not Used)
LHAAP-17
171.00
18WW15 (171.22)
AVE "Q"
LONG POINT RD
C-10 (170.31)
ROBERT AVE
Pistol Range
LHAAP-19
18WW01 (170.33)
HAYSTACK RD.
LHAAP-003-R

0 225 450 900 Feet

Legend:
- Wilcox Zone Monitoring Well Location
- Monitoring Well Locations associated with surrounding LHAAAP sites. (Not Measured)
- (170.31) Potentiometric Surface Elevation in Feet Above Mean Sea Level
- Potentiometric Surface Contour
- Direction of Groundwater Flow
- Installation Restoration Program (IRP) Area
- Stream / Ditch Centerline
- Road Line

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Groundwater Treatment Plant
Longhorn Army Ammunition Plant, Karnack, Texas

PROJECT NO:	SCALE:	DATE:	DRAWN BY:
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Groundwater Potentiometric Surface Map
Wilcox Zone (February 25, 2020) LHAAP-18/24

Figure B-5

TALYER AVE
LHAAP-35C (53)
Harrison Bayou
18WW04 (168.30)
18WW19 (168.23)
18CPTMW19SW (167.67)
18WW21 (169.52)
C-04 (170.59)
C-04A (170.81)
18WW09 (168.81)
18WW18 (169.93)
18CPTMW08SW (169.86)
18CPTMW08DW (169.69)
C-03 (169.85)
18WW02 (170.79) (Not Used)
18CPTMW23SW (169.54)
MW-14 (173.09)
LHAAP-24
18CPTMW04SW (169.92)
18CPTMW01SW (170.90) (Not Used)
18CPTMW07 (169.92)
18WW06 (170.49)
MW-13 (169.89)
18CPTMW01DW (169.97)
18WW11 (168.98)
18WW03 (169.26)
LHAAP-18
18CPTMW06 (169.73)
18CPTMW03SW (169.66)
BOBBY JONES RD.
18CPTMW10DW (169.97) (Not Used)
18CPTMW10SW (170.01)
Groundwater Treatment Plant
18CPTMW12SW (170.13)
LHAAP-39
18CPTMW12DW (170.17)
Unnamed Ditch
18CPTMW26SW (169.83)
18CPTMW22SW (169.85)
LHAAP-17
LHAAP-63
Saunders Branch
18CPTMW22DW (169.12) (Not Used)
C-01 (170.14)
18WW15 (171.45)
C-10 (170.49)
LONG POINT RD
AVE "Q"
ROBERT AVE
Pistol Range
LHAAP-19
18WW01 (170.59)
HAYSTACK RD.
LHAAP-003-R
168.50
169.00
170.00
170.50
171.00
172.00
172.50
169.50

0 225 450 900 Feet

Legend:
- Wilcox Zone Monitoring Well Location
- Monitoring Well Locations associated with surrounding LHAAAP sites. (Not Measured)
- (170.49) Potentiometric Surface Elevation in Feet Above Mean Sea Level
- Potentiometric Surface Contour
- Direction of Groundwater Flow
- Installation Restoration Program (IRP) Area
- Stream / Ditch Centerline
- Road Line

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Quarterly Evaluation Report 1st Quarter (January – March) 2020
Groundwater Treatment Plant
Longhorn Army Ammunition Plant, Karnack, Texas

PROJECT NO:	SCALE:	DATE:	DRAWN BY:
NWO1312.0150	As Shown	4/29/2020	MRM

Groundwater Potentiometric Surface Map
Wilcox Zone (March 31, 2020) LHAAP-18/24

Figure B-6

APPENDIX C
GWTP WATER SAMPLING LABORATORY ANALYTICAL RESULTS FOR THE 1ST QUARTER 2020 (PROVIDED ON CD ONLY)

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APPENDIX D
PROTOCOL FOR DISCHARGING GWTP EFFLUENT

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MEMORANDUM

DATE: August 28, 2017

PROJECT NAME: Remediation of Multiple Sites, Longhorn Army Ammunition Plant, Karnack, TX

TO:	Richard Mayer	Senior Project Engineer US Environmental Protection Agency Federal Facilities Section (6PD-F)
	April Palmie	Project and Grant Manager Superfund Section, Remediation Division Texas Commission on Environmental Quality
FROM:	Rose M. Zeiler, Ph.D.	Longhorn AAP Site Manager

SUBJECT: **Protocol for Discharging GWTP Effluent**
Longhorn Army Ammunition Plant, Karnack, TX
(Contract: W912DY-09-D-0059, Task Order DS01)

INTRODUCTION

The purpose of this memo is to document the protocol for discharging Longhorn Army Ammunition Plant groundwater treatment plant (GWTP) effluent to Harrison Bayou, the INF-Pond, or LHAAP-18/24.

The GWTP is designed to:

- Extract groundwater from LHAAP-18/24 and LHAAP-16 for hydraulic control;
- Remove metals by pH adjustment, polymer addition, and gravity separation;
- Remove volatile organic compounds (VOCs) by air stripping;
- Remove perchlorate in a fluidized bed reactor (FBR) and an ion exchange scavenger system; and
- Discharge the effluent continuously.

DISCHARGE CRITERIA

The discharge criteria established for discharge to Harrison Bayou are:

Parameter	Discharge Criteria (µg/L)	
	Daily Average	Daily Maximum
Volatiles		
1,1,1-Trichloroethane	3,417	7,230
1,1,2-Trichloroethane	102.5	216.9
1,1-Dichloroethane	6,633	14,032
1,1-Dichloroethene	119	253
1,2-Dichloroethane	85	181
Acetone	1,132	2,395
Benzene	85	181
Carbon Tetrachloride	85	181
Chlorobenzene	22,300	47,180
Chloroform	1,708	3,615
Ethylbenzene	26,954	57,025
Xylenes	39.5	83.6
Methylene Chloride	803	1,699
Styrene	2,829	5,987
Tetrachloroethene	85.4	180.7
Toluene	1,980	4,189
Trichloroethene	85	181
Vinyl Chloride	34	72
Anions		
Chloride	*	*
Sulfate	*	*
Perchlorate**	278	589
Metals		
Aluminum	777	1,644
Arsenic	365	772
Barium	1,000	2,000
Cadmium	1.6	3.4
Chromium, Total	355	752
Chromium, Hexavalent	58	124
Cobalt	5,433	11,495
Iron	1,132	2,395
Lead	2.2	4.6
Nickel	87	184
Manganese	7,323	15,494
Silver	1.4	3
Selenium	5.7	12
Vanadium	1,698	3,592
Zinc	146	310
Other		
Hexachlorobenzene	0.22	0.47
1,4-Dioxane		134.2
Oil and Grease		15
Chemical Oxygen Demand		200

* - Based upon flow in Harrison Bayou

** - Discharge criteria, when diverted to the INF Pond, is 17 µg/L

PROTOCOL FOR DISCHARGING GWTP EFFLUENT

In accordance with the *Sampling and Analysis Plan, Groundwater Treatment Plant and Well Fields* (SAP) Table 2-2, indicator parameters for the FBR, such as temperature, pH and oxidation reduction potential (ORP), are monitored in real time to predict FBR performance and perchlorate removal. Based upon these indicator parameters, the operator of the GWTP can make adjustments such as:

- Bring the ion exchange system online;
- Increase or decrease the addition rate of electron donor (acetic acid);
- Increase or decrease the nutrient addition rate (urea or phosphoric acid); or
- Increase or decrease the FBR recirculation rate

Samples of the GWTP effluent are collected weekly, analyzed for perchlorate, nutrients (ammonia-nitrogen and ortho-phosphate), total organic carbon (TOC), chloride, and sulfate, with the results received from the laboratory 14 days later. Other parameters (e.g. Record of Decision metals and volatiles) are collected and analyzed in GWTP effluent samples according to the frequencies listed in Table 2-1 of the SAP.

As shown in Figure 1, groundwater is continuously extracted, treated, and discharged. If Harrison Bayou is flowing and indicator parameters are within their historical optimal ranges, then the ion exchange vessels can be bypassed and the GWTP effluent sample will be collected after the FBR. If Harrison Bayou is not flowing or the indicator parameters are not within historical optimal ranges, then the ion exchange vessels will be put on line, and the GWTP effluent sample will be collected between the lead and lag ion exchange vessel. Professional judgement may also be used as to when to bring the ion exchange vessels online, such as after a power outage or during anticipated cold temperatures when the FBR has historically not performed optimally.

If a parameter is measured in the effluent at a concentration above the discharge criteria, then a confirmation sample and an effluent sample after the lag ion exchange vessel will be collected and analyzed for the parameter with a 24-hour turnaround time. Corrective measures (e.g. increased nutrient or electron donor addition rates, bring ion exchange vessels on line) will be implemented as appropriate to bring the parameter back within the discharge criteria. ***If an upset condition in the FBR leads to high concentrations of perchlorate going into the lead ion exchange vessel and breaking through at the sample location between the vessels, the lag vessel will still remove perchlorate before it is discharged to Harrison Bayou, the INF Pond, or LHAAP-18/24.*** It is estimated that the lag ion exchange vessel can remove all of the perchlorate from two weeks of typical groundwater extraction at a concentration of 920 µg/L. If the residual perchlorate concentration after the FBR and lead ion exchange vessel is only 600 µg/L, the lag ion exchange vessel could last almost 2.5 years before perchlorate would be detected in the discharged effluent.

If a parameter exceeds the discharge criteria by more than 40% (see Appendix A-2, SAP, Section 7c of Monitoring and Reporting Requirements) or reaches 920 µg/L of perchlorate, then the GWTP will be put into full recycle mode (no discharge) until the parameter is below the discharge criteria again. Appendix A-2 of the SAP requires GWTP data to be provided to TCEQ monthly including a list of noncompliance(s), if applicable.

Discharge to Harrison Bayou

As shown in Figure 1, the GWTP effluent will be discharged to Harrison Bayou as long as it has a measurable flow. The flowrate in Harrison Bayou is estimated by measuring the height of water with a staff gauge and velocity in feet/sec at intervals along the width as described in the Installation-Wide Work Plan, Standard Operating Procedures, Attachment 18 – Water Depth and Velocity Measurements (AECOM, July 2014).

The allowable flow rate of GWTP effluent that can be discharged to Harrison Bayou is given by:

$$QE \leq \frac{QS\ (CC - CA)}{(CE - CC)}$$

where Q_E = GWTP effluent flow Q_S = Harrison Bayou flow

C_C = Criteria concentration (100 mg/L for chloride, 50 mg/L for sulfate)

C_A = Ambient concentration = 10 mg/L

C_E = Chloride or sulfate concentration in GWTP effluent

The allowable GWTP effluent flow will be the lower of the calculated values given the measured concentrations of chloride and sulfate in the discharge stream. For each day that GWTP effluent is discharged to Harrison Bayou, the measured Harrison Bayou flow, the allowable effluent flow, and the actual effluent flow are recorded.

Discharge to INF Pond

If Harrison Bayou is not flowing, then GWTP effluent will be discharged to the Intermediate-Range Nuclear Forces (INF) Pond for temporary storage until Harrison Bayou flow resumes. Perchlorate concentration detected in the effluent must be 17 µg/L or less, when this occurs.

The INF Pond has a flexible membrane liner protected by a soil cover with a gravity discharge pipe (and valve) to Harrison Bayou. The INF Pond has a nominal capacity of 3 million gallons with a staff gage to measure the height of water stored in the pond. The GWTP operator maintains the INF Pond by visually inspecting for erosion, vegetative growth including tree growth along the anchor trench, and liner integrity and making necessary repairs. Periodically, accumulated debris must be removed from the influent and effluent piping to the INF Pond.

Prior to discharging to the INF Pond, a lead and lag ion exchange vessel will be brought online. The GWTP Operator will also confirm that the discharge valve is closed, will record the reading on the effluent totalizer, and will record the height of water using the staff gage. The GWTP Operator will then configure valves and pumps to direct GWTP effluent to the INF Pond. The height of water in the INF Pond and totalizer reading will be recorded at the beginning and end of each shift for the duration of active discharge. When the height of water in the pond reaches 3 feet below the height of the berm (freeboard), the GWTP Operator will stop discharging to the INF Pond and TCEQ will be notified. After the TCEQ acknowledges the INF Pond level, GWTP effluent may be discharged to the INF Pond again until 2 feet of freeboard is reached. The GWTP Operator will stop discharging to the INF Pond and TCEQ will be notified again. After the TCEQ acknowledges 2 feet of freeboard in the INF Pond,GWTP effluent may be discharged again until 1 foot of freeboard remains. No additional GWTP effluent can be accepted at the INF Pond until greater than 1 foot of freeboard is measured.

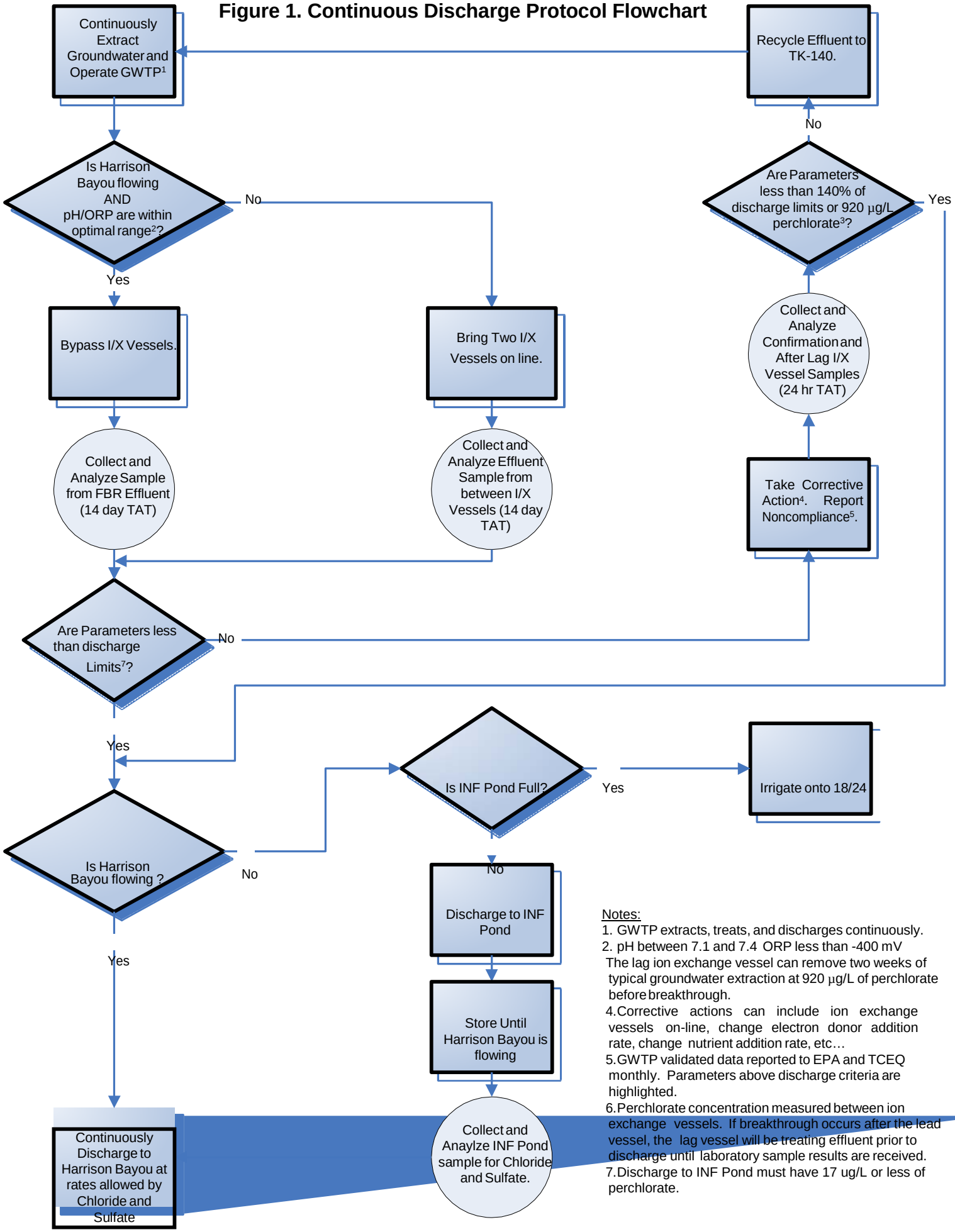
As soon as flow in Harrison Bayou returns, stored GWTP effluent from the INF Pond will be discharged. As with direct discharges from the GWTP to Harrison Bayou, the allowable flowrate of effluent from the INF Pond is calculated based upon the chloride and sulfate concentrations in the pond and the flow in Harrison Bayou. If effluent from the INF Pond and the GWTP are discharged simultaneously, total flow of both streams together should not exceed the calculated discharge level for either discharge location. For each day that INF Pond contents are discharged to Harrison Bayou, the measured Harrison Bayou flow, the allowable effluent flow, and the actual effluent flow are recorded.

Irrigation onto LHAAP-18/24

If Harrison Bayou is not flowing and the INF Pond has less than 1 foot of freeboard, then GWTP effluent will be irrigated onto LHAAP-18/24 using one of the three main sprinkler lines. To avoid pooling and runoff of irrigation water, only one line will be used for half a day at a time, with a separate line being used the second half of the day. If needed, the irrigation will occur 5 days a week for 8 hours each day (using 3 sprinklers in each line). If conditions are wet due to rain events, irrigation will not be conducted to avoid ponding and potential runoff, the GWTP will be put into recycle mode, and groundwater extraction will be interrupted if storage space is not available.

While irrigating, site inspections will be performed to ensure pooling and runoff are not occurring. During the irrigation activities, inspections will be performed twice a day, once approximately three hours and again approximately six hours into the 8-hour irrigation shift. The system will be inspected to ensure that the sprinkler heads are operating properly and not leaking large amounts of water. If ponding or runoff is observed, irrigation at that sprinkler line will cease, and irrigation at another sprinkler line will be started if possible. Volumes of GWTP effluent and twice daily inspections will be recorded daily and reported monthly until flow resumes in Harrison Bayou or greater than 1 foot of freeboard is available in the INF Pond.

Figure 1. Continuous Discharge Protocol Flowchart



Notes:

1. GWTP extracts, treats, and discharges continuously.
2. pH between 7.1 and 7.4 ORP less than -400 mV
   The lag ion exchange vessel can remove two weeks of typical groundwater extraction at 920 µg/L of perchlorate before breakthrough.
4. Corrective actions can include ion exchange vessels on-line, change electron donor addition rate, change nutrient addition rate, etc…
5. GWTP validated data reported to EPA and TCEQ monthly. Parameters above discharge criteria are highlighted.
6. Perchlorate concentration measured between ion exchange vessels. If breakthrough occurs after the lead vessel, the lag vessel will be treating effluent prior to discharge until laboratory sample results are received.
7. Discharge to INF Pond must have 17 ug/L or less of perchlorate.

APPENDIX E
QUALITY CONTROL SUMMARY REPORT

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QUALITY CONTROL SUMMARY REPORT
1st QUARTER (JANUARY-MARCH) 2020
GROUNDWATER TREATMENT PLANT
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

June 2020

Prepared For:

Longhorn Army Ammunition Plant
Karnack, Texas

Under Contract To:

U.S. Army Corps of Engineers
Tulsa District
Tulsa, Oklahoma

Contract Number: W9128F-13-D-0012
Task Order Number: W912BV17F0150

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Table 2: Qualified Analytical Data
Table 3: Completeness by Method

1 INTRODUCTION

Bhate reviewed 29 data packages from ALS Environmental, Houston, Texas. Samples were collected from January 7, 2020, through March 31, 2020, at the Groundwater Treatment Plan (GWTP) at Longhorn Army Ammunition Plant (LHAAP), Karnack, Texas. Data were reviewed for conformance to the requirements of the following guidance documents: [U.S. Environmental Protection Agency] *USEPA Contract Laboratory Program* [CLP] *National Functional Guidelines for Superfund Organic Methods Data Review* (USEPA, January 2017); *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review* (USEPA, January 2017); and the *Final Basewide Uniform Federal Policy* [UFP] – *Quality Assurance Project Plan* [QAPP] *Longhorn Army Ammunition Plant* which is in Appendix C of the *Final Installation-Wide Work Plan for Longhorn Army Ammunition Plant Karnack, Texas* (Bhate, May 2018).

1.1 Intended Use of Data

The objective of sampling at the GWTP is to monitor effluent streams to confirm compliance with discharge limits.

Analyses performed include:

- E6850 – Perchlorate
- E350.3 – Nitrogen, Ammonia
- E365.3 – Orthophosphate
- SM5310C – Total Organic Carbon
- SW8260C - Volatile Organic Compounds (VOCs)
- SW8270D - Selected Ion Monitoring (SIM) - 1,4-Dioxane
- SW6020A/7470A – Metals
- SW9056A – Chloride (Cl) and Sulfate (SO_4)
- SW7196A – Hexavalent Chromium
- E410.4 – Chemical Oxygen Demand
- E1664A – Oil and Grease
- TO-15 – Volatiles in Air

Table 1 lists the sample identification (ID) numbers and their associated laboratory package.

Table 2 lists qualified results with the qualification flag and reason code.

The following narrative is a brief synopsis of data that required qualification due to quality control discrepancies.

1.2 Preservation and Holding Times

Sample identification data were evaluated for agreement with the chain-of-custody (COC). All samples were received in appropriate containers, within the proper temperature range, in good condition, and within the required hold time.

1.3 Calibrations

All analytes reported must be present in the initial and continuing calibration. The calibrations must meet the acceptance criteria specified in Worksheet 24 (Analytical Instrument Calibration) of the QAPP. All results reported must be within the calibration range. Samples were diluted, if necessary, to bring analyte responses within the calibration range.

1.3.1 Continuing Calibration Verifications (CCV)

The calibrations must meet the following criteria otherwise the compound is qualified J or UJ: The continuing calibration verification (CCV) criteria are 20 percent difference (%D) for VOCs and Semi-Volatile Organic Compounds (SVOCs) and 50% for closing CCVs. Metals and general chemistry - 10%D; perchlorate - 15%D; and volatiles in air - 30%D.

1.4 Blanks

If the analyte result for an associated sample was less than 5X (10X for common laboratory contaminants) the analyte concentration in the blank, that result was qualified "UB" and considered an artifact of blank contamination. Where the sample result for the affected analyte was non-detect or greater than 5X the amount in the blank, no qualifier was applied.

No data was affected by blank contamination.

1.5 Surrogates

Surrogates were evaluated using limits defined by each method in the project-specific QAPP Worksheet 28.

1.5.1 SW8260

The toluene surrogate in sample LH18/24-SP140_022520 was recovered above control limits. The detected compounds 1,2-dichloroethane; cis-1,2-dichloroethene; methylene chloride; tetrachloroethene; and vinyl chloride were qualified as estimated, "J".

1.6 Laboratory Control Sample (LCS)/Laboratory Control Sample Duplicate (LCSD)

LCS/LCSD recoveries were evaluated using limits defined in the project-specific QAPP Worksheet 15.

All LCS recoveries were within control limits.

1.7 Matrix Spike (MS)/Matrix Spike Duplicate Sample (MSD)

MS/MSD recoveries were evaluated using limits defined in Worksheet 15 of the project-specific QAPP. When sample results were greater than 4X the spike amount, control limits were not applicable and require no qualification. Furthermore, if a MS/MSD analyses was performed on a batched (unrelated) sample no qualification was made to the sample data. Otherwise, only the sample used for spiking requires qualification.

1.7.1 SW8260C

The MS and/or MSD recoveries for LH18/24-SP650_020420 and LH18/24-SP650_021920 were below control limits for vinyl chloride. This non-detected compound was flagged estimated "UJ" in both samples. The MSD recovery for LH18/24-SP650_022520 was below control limits for methylene chloride. This non-detected compound was qualified as estimated, "UJ".

1.7.2 SW6020A

The MS recovery for LH18/24-SP650_022520 was below control limits for barium. This compound was flagged as estimated, "J".

1.7.3 SW7196A

The MS recovery for hexavalent chromium was below control limits in sample LH18/24-SP650_021120 and flagged as estimated, "UJ".

1.8 Internal Standards

If the percent recovery (%R) for an internal standard in a sample is not within the limit, the associated sample is qualified for those analytes associated with the internal standard(s) outside of the limit.

Internal standards were within acceptance criteria for the associated compounds.

1.9 Precision

Precision is the measure of variability of individual sample measurements. Evaluation of laboratory and/or field duplicates for precision was done using the relative percent difference (RPD). The RPD is defined as the difference between two duplicate samples divided by the mean and expressed as a percent. Field duplicate RPD limits were set at <30% for groundwater and air matrices. Laboratory duplicate RPD limits were set at <25% for air matrices.

All duplicate RPDs were within control limits.

2 DATA USABILITY SUMMARY

The data are usable for the intended purposes of the project (Table 3). The data quality objectives have been met for the project.

Table 1: Field Sample Identification and Laboratory Packages

Client Sample ID	Lab Package	E6850	E350.3	E365.3	SM5310C	SW8270D SIM	SW8260C	SW6020A	SW9056A	SW7196A	E410.4	1664A	TO-15
GWTP Samples													
LH18/24-SP650_010720/BIX	HS20010261	X	X	X	X								
LH18/24-SP140_010720	HS20010258	X						X		X			
LH18/24-SP650_010720/BIX	HS20010259	X				X	X	X		X			
LH18/24-SP650_012320	HS20011089						X		X				
LH18/24-SP650_012320/BIX	HS20011091	X	X	X	X								
LH18/24-SP650_012820/BIX	HS20011311	X	X	X	X								

Client Sample ID	Lab Package	E6850	E350.3	E365.3	SM5310C	SW8270D SIM	SW8260C	SW6020A	SW9056A	SW7196A	E410.4	1664A	TO-15
LH18/24-SP650_012820	HS20011312						X						
LH18/24-SP650_020420/BIX	HS20020147	X	X	X	X								
LH18/24-SP650_020420	HS20020146						X		X				
LH18/24-SP650_021120/BIX	HS20020473	X	X	X	X								
LH18/24-SP140_021120	HS20020472	X						X		X			
LH18/24-SP650_021120/BIX	HS20020474	X				X	X	X		X			
LH18/24-SP650_021920	HS20020835						X		X				
LH18/24-SP650_021920/BIX	HS20020832	X	X	X	X								
LH18/24-SP650_022520/BIX	HS20021115	X	X	X	X								
LH18/24-SP140_022520	HS20021121	X				X	X	X	X		X	X	
LH18/24-SP650_022520/BIX	HS20021120	X				X	X	X	X		X	X	
LH18/24-SP650_030420/BIX	HS20030169	X	X	X	X								
LH18/24-SP650_030420	HS20030172						X		X				
LH18/24-SP650_031020/BIX	HS20030430	X	X	X	X								
LH18/24-SP140_031020	HS20030427	X						X		X			
LH18/24-SP650_031020/BIX	HS20030425	X				X	X	X		X			
LH18/24-SP650_031720/BIX	HS20030840	X	X	X	X								
LH18/24-SP650_031720	HS20030838						X		X				
LH18/24-SP650_032420/BIX	HS20031081	X	X	X	X								
LH18/24-SP650-032420	HS20031080						X						
LH18/24-SP650_033120/BIX	HS20040018	X	X	X	X								
LH18/24-SP650_033120	HS20040019						X		X				
Air Samples													
LH18/24-Air_022420_Stripper	P1907777												X
LH18/24-Air_022420_Stripper_a	P1907777												X
LH18/24-Air_022420_GWTP	P1907777												X
LH18/24-Air_022420_Downwind	P1907777												X

Notes:
GWTP – Groundwater Treatment Plant
MW – Monitoring Well
SM – Standard Method
SW-846 - Test Methods for Evaluating Solid Waste, Physical/Chemical Methods.
E – U.S. Environmental Protection Agency Method
HS – Houston
BIX – before ion exchange

Table 2: Qualified Analytical Data

Client Sample ID Laboratory	Laboratory Package	Analyte Name	Data Validation Qualifier (volatiles in µg/L; metals/TOC in mg/L)	Reason for Qualification
LH18/24-SP650_020420	HS20020146	Vinyl chloride	< 0.50 UJ	MSD <
LH18/24-SP650_021920	HS20020835	Vinyl chloride	< 0.50 UJ	MS/MSD <
LH18/24-SP650_021120	HS20020474	Hexavalent Chromium	< 0.0100 UJ	MS <
LH18/24-SP650_022520	HS20021120	Methylene chloride Barium	< 1.0 UJ 0.197 J	MSD < MS <
LH18/24-SP140_022520	HS20021121	1,2-Dichloroethane cis-1,2-Dichloroethene Methylene chloride Tetrachloroethene Vinyl chloride	39 J 2,100 J 2,200 J 52 J 68 J	Surr >

Notes:
mg/L – milligrams per liter
µg/L – micrograms per liter
J – Estimated: The analyte was positively identified, the quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.
UJ – Estimated not detected due to discrepancies in meeting certain analyte specific quality control criteria and reported to the limit of detection.
MS/MSD <> - matrix spike/matrix spike duplicate recovery below/above control limits
Surr > - surrogate recovery above control limits

Table 3: Completeness by Method

Method	No. of Rejected Results	% Completeness
E6850	0	100
E350.3	0	100
E365.3	0	100
SM5310C	0	100
SW8270D	0	100
SW8260C	0	100
SW6020A/SW7470A	0	100
SW9056A	0	100
SW7196A	0	100
E410.4	0	100
E1664A	0	100
TO-15	0	100

APPENDIX F
AIR MONITORING DATA – 1ST QUARTER 2020

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ATTACHMENT 1: AIR MONITORING CALCULATIONS

Appendix F Table 1. Ambient Air Data - February 2020
Longhorn Army Ammunition Plant
Groundwater Treatment Plant

Pollutant	CAS #	Short Term ESL March 2012	AMCVs (ST Health)	GWTP Ambient Air Concentrations (1)		Status (3)	Downwind Ambient Air Concentrations (2)		Status (3)
		µg/m^3	µg/m^3	µg/m^3			µg/m^3		
1,1-Dichloroethane	75-34-3	4,000	4,047	0.78	U	PASS	0.64	U	PASS
1,1-Dichloroethene	75-35-4	210	714	0.77	U	PASS	0.63	U	PASS
1,2-Dichloroethane	107-06-2	160	162	0.77	U	PASS	0.63	U	PASS
Acetone	67-64-1	5,900	NA	7.5	U	PASS	6.2	U	PASS
Benzene	71-43-2	170	575	0.75	U	PASS	0.62	U	PASS
Carbon disulfide	75-15-0	30	NA	1.6	U	PASS	1.3	U	PASS
Chloroform	67-66-3	100	98	0.77	U	PASS	0.63	U	PASS
cis-1,2-Dichloroethene	156-59-2	7,900	NA	**2.2**		PASS	0.62	U	PASS
Methylene chloride	75-09-2	3,600	12,158	**2.3**		PASS	**0.79**		PASS
Tetrachloroethene	127-18-4	2,000	6,782	0.74	U	PASS	0.61	U	PASS
trans-1,2-Dichloroethene	156-60-5	7,900	NA	0.77	U	PASS	0.63	U	PASS
Trichloroethene	79-01-6	540	537	**4.5**		PASS	**1.30**		PASS
Vinyl chloride	75-01-4	20,000	66,460	0.77	U	PASS	0.63	U	PASS
n-Hexane	110-54-3	5,300	6,336	**0.82**		PASS	**0.70**		PASS
Styrene	100-42-5	110	21,725	0.75	U	PASS	0.62	U	PASS
Toluene	108-88-3	640	15,074	0.77	U	PASS	0.63	U	PASS
Ethylbenzene	100-41-4	740	86,844	0.77	U	PASS	0.63	U	PASS
m,p-Xylenes	179601-23-1	180	7,382	1.6	U	PASS	1.3	U	PASS
o-Xylene	95-47-6	1,600	7,382	0.77	U	PASS	0.63	U	PASS
1,3-Dichlorobenzene	541-73-1	720	NA	0.77	U	PASS	0.63	U	PASS
Propene (C3 H6)	115-07-1	Asphyxiant	Asphyxiant	0.75	U	NA	0.62	U	NA
Dichlorodifluoromethane (CFC 12)	75-71-8	50,000	49,452	**2.5**		PASS	**2.1**		PASS
Ethanol	64-17-5	18,800	NA	7.4	U	PASS	6.1	U	PASS
Trichlorofluoromethane (CFC 11)	75-69-4	28,000	56,184	**1.3**		PASS	**1.1**		PASS
Trichlorotrifluoroethane (CFC 113)	76-13-1	38,000	NA	**5**		PASS	**2.0**		PASS
alpha-Pinene	80-56-8	60	3,499	0.77	U	PASS	0.63	U	PASS
d-Limonene	5989-27-5	1,100	NA	0.77	U	PASS	0.63	U	PASS

Notes:

(1) Sample collected over an 8-hour period on February 24, 2020, between 8 AM and 4 PM

(2) Sample collected over a 24-hour period beginning on February 24, 2020, at 7:00 AM and ending on February 25,2020 at 7:00 AM

(3) Status based on comparison of air sample result to Air Monitoring Comparison Values (AMCVs). When there is no AMCV value for a chemical, the air sample concentration is compared to the short-term Effects Screening Level (ESL).

CAS = Chemical Abstracts Service Number

GWTP = Groundwater Treatment Plant

U = non-detect

µg/m^3 = micrograms per cubic meter

Appendix F Table 2. Emission Stack Air Data - February 2020
Longhorn Army Ammunition Plant
Groundwater Treatment Plant

Pollutant	CAS #	Measured Air Stripper Stack Concentrations (1)		Air Stripper Emission Rates (2)		Air Stripper Emission Rates (2a)		Allowable Annual Emission (3)	Status (4)	TLV (L)	TLV Reference	Compliance section	Distance Downwind to nearest off-site Receptor (D)	(K) conversion value	Allowable Maximum Hourly Emission Limit at Nearest off-site Receptor [6][7] (E) = L/K	Status (8)
		µg/m^3		lb/hr		tpy		tpy		mg/m^3			feet		lb/hr	
1,1-Dichloroethane	75-34-3	47	U	3.85E-04	U	2.50E-04	U	5	PASS	405	ACGIH List	30 TAC 106.533(f)(1)(A)(ii)	2,000	14	1.0	PASS
1,1-Dichloroethene	75-35-4	**240**		3.93E-03		2.56E-03		5	PASS	20	ACGIH List	30 TAC 106.533(f)(1)(A)(ii)	2,000	14	1.4	PASS
1,2-Dichloroethane	107-06-2	**160**		2.62E-03		1.71E-03		5	PASS	40	ACGIH List	30 TAC 106.533(f)(1)(A)(ii)	2,000	14	2.9	PASS
Acetone	67-64-1	**540**		8.85E-03		5.75E-03		5	PASS	590	106.262 List	30 TAC 106.533(f)(1)(A)(ii)	2,000	14	1.0	PASS
Benzene	71-43-2	45	U	3.69E-04	U	2.40E-04	U	5	PASS	3	106.262 List	30 TAC 106.533(f)(1)(A)(ii)	2,000	14	0.21	PASS
Carbon disulfide	75-15-0	93	U	7.62E-04	U	4.96E-04	U	5	PASS	31	ACGIH List	30 TAC 106.533(f)(1)(A)(ii)	2,000	14	2.2	PASS
Chloroform	67-66-3	**47**		7.71E-04		5.01E-04		5	PASS	10	106.262 List	30 TAC 106.533(f)(1)(A)(ii)	2,000	14	0.71	PASS
cis-1,2-Dichloroethene	156-59-2	**11,000**		1.80E-01		1.17E-01		5	PASS	793	ACGIH List	30 TAC 106.533(f)(1)(A)(ii)	2,000	14	1.0	PASS
Methylene chloride	75-09-2	**9,900**		1.62E-01		1.06E-01		5	PASS	26	106.262 List	30 TAC 106.533(f)(1)(A)(ii)	2,000	14	1.9	PASS
Tetrachloroethene	127-18-4	**170**		2.79E-03		1.81E-03		5	PASS	33.5	106.262 List	30 TAC 106.533(f)(1)(A)(ii)	2,000	14	2.4	PASS
trans-1,2-Dichloroethene	156-60-5	**41**		6.72E-04		4.37E-04		5	PASS	793	ACGIH List	30 TAC 106.533(f)(1)(A)(ii)	2,000	14	1.0	PASS
Trichloroethene	79-01-6	**22,000**		3.61E-01		2.34E-01		5	PASS	135	106.262 List	30 TAC 106.533(f)(1)(A)(ii)	2,000	14	6.0	PASS
Vinyl chloride	75-01-4	**340**		5.57E-03		3.62E-03		5	PASS	2	106.262 List	30 TAC 106.533(f)(1)(A)(ii)	2,000	14	0.14	PASS
n-Hexane	110-54-3	46	U	3.77E-04	U	2.45E-04	U	5	PASS	1,800	ACGIH List	30 TAC 106.533(f)(1)(A)(ii)	2,000	14	1.0	PASS
Styrene	100-42-5	45	U	3.69E-04	U	2.40E-04	U	5	PASS	21	106.262 List	30 TAC 106.533(f)(1)(A)(ii)	2,000	14	1.5	PASS
Toluene	108-88-3	46	U	3.77E-04	U	2.45E-04	U	5	PASS	188	ACGIH List	30 TAC 106.533(f)(1)(A)(ii)	2,000	14	6.0	PASS
Ethylbenzene	100-41-4	46	U	3.77E-04	U	2.45E-04	U	5	PASS	434	ACGIH List	30 TAC 106.533(f)(1)(A)(ii)	2,000	14	1.0	PASS
m,p-Xylenes	179601-23-1	93	U	7.62E-04	U	4.96E-04	U	5	PASS	434	ACGIH List	30 TAC 106.533(f)(1)(A)(ii)	2,000	14	1.0	PASS
o-Xylene	95-47-6	46	U	3.77E-04	U	2.45E-04	U	5	PASS	434	ACGIH List	30 TAC 106.533(f)(1)(A)(ii)	2,000	14	1.0	PASS
1,3-Dichlorobenzene	541-73-1	46	U	3.77E-04	U	2.45E-04	U	5	PASS	(5)	--	30 TAC 106.533(f)(1)(A)(i)	2,000	14	1.0	PASS
Propene (C3 H6)	115-07-1	45	U	3.69E-04	U	2.40E-04	U	5	PASS	(5)	--	30 TAC 106.533(f)(1)(A)(i)	2,000	14	6.0	PASS
Dichlorodifluoromethane (CFC 12)	75-71-8	45	U	3.69E-04	U	2.40E-04	U	5	PASS	4,950	ACGIH List	30 TAC 106.533(f)(1)(A)(ii)	2,000	14	1.0	PASS
Ethanol	64-17-5	440	U	3.61E-03	U	2.34E-03	U	5	PASS	1,880	ACGIH List	30 TAC 106.533(f)(1)(A)(ii)	2,000	14	1.0	PASS
Trichlorofluoromethane (CFC 11)	75-69-4	45	U	3.69E-04	U	2.40E-04	U	5	PASS	5,620	ACGIH List	30 TAC 106.533(f)(1)(A)(ii)	2,000	14	1.0	PASS
Trichlorotrifluoroethane (CFC 113)	76-13-1	**19,000**		3.12E-01		2.02E-01		5	PASS	7,670	ACGIH List	30 TAC 106.533(f)(1)(A)(ii)	2,000	14	1.0	PASS
alpha-Pinene	80-56-8	46	U	3.77E-04	U	2.45E-04	U	5	PASS	(5)	--	30 TAC 106.533(f)(1)(A)(i)	2,000	14	1.0	PASS
d-Limonene	5989-27-5	46	U	3.77E-04	U	2.45E-04	U	5	PASS	(5)	--	30 TAC 106.533(f)(1)(A)(i)	2,000	14	1.0	PASS
		TOTAL		1.050												

Notes:

(1) Sample collected on February 24, 2020. The higher value of the sample or duplicate is reported.

(2) Based on a blower flow rate of 4,390 cubic feet per minute (cfm). Note that plant operations is less than or equal to 25 hours per week. 1/2 of detection limit was used for estimating mass rate

(2a) Based on operation of 25 hours per week, 52 weeks per year.

(3) Per 30TAC 106.533(f)(1)(B)

(4) Based on comparing the calculated air stripper stack sample emission rate in tons per year (tpy) to the allowable annual emission limit per chemical of 5 tpy.

(5) No Threshold Limit Values (TLVs) for these chemicals

(6) The maximum hourly limit allowed by 30 Texas Administrative Code (TAC) 106.262, per pollutant, is 6 pounds per hour (lb/hr) per Figure 1: 30 TAC 106.262(a) . The E value was overridden with 6 lb/hr when the calculated E was higher.

(7) The maximum hourly emission rate allowed by 30 TAC 106.261(a)(3) for chemicals with a limit value (L) greater than 200 mg/m^3 is 1 lb/hr.

(8) Based on comparing the calculated air stripper stack sample emission rate in lb/hr to the allowable maximum emission limit per chemical based on distance downwind to nearest off-site receptor.

CAS = Chemical Abstracts Service Number

mg/m^3 = milligrams per cubic meter

µg/m^3 = micrograms per cubic meter

U = non-detect

ATTACHMENT 2: PID READINGS AND CALIBRATION LOGS

Appendix F Table 3. PID Readings - 1st Quarter 2020
Longhorn Army Ammunition Plant
Groundwater Treatment Plant

Date	Time	Location	Air Flow Rate at Blower	Instrument ID	Person Collecting	PID Reading	Weather Conditions
1/2/2020	8:00	Outside GWTP Office	3863 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Cloudy/Rain 51 F
1/2/2020	8:00	Downwind	3863 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Cloudy/Rain 51 F
1/2/2020	8:00	Stripper	3863 ACFM	MiniRAE 3000	Kennie Moore	Max. 22.9 ppm Steady State 5.5 ppm	Cloudy/Rain 51 F
1/2/2020	13:00	Outside GWTP Office	3677 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Cloudy/Rain 56 F
1/2/2020	13:00	Downwind	3677 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Cloudy/Rain 56 F
1/2/2020	13:00	Stripper	3677 ACFM	MiniRAE 3000	Kennie Moore	Max. 24.5 ppm Steady State 6.6 ppm	Cloudy/Rain 56 F
1/6/2020	8:00	Outside GWTP Office	3821 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 42 F
1/6/2020	8:00	Downwind	3821 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 42 F
1/6/2020	8:00	Stripper	3821 ACFM	MiniRAE 3000	Kennie Moore	Max. 25.2 ppm Steady State 8.9 ppm	Clear 42 F
1/6/2020	14:00	Outside GWTP Office	3619 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 67 F
1/6/2020	14:00	Downwind	3619 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 67 F
1/6/2020	14:00	Stripper	3619 ACFM	MiniRAE 3000	Kennie Moore	Max. 21.4 ppm Steady State 6.3 ppm	Clear 67 F
1/9/2020	8:00	Outside GWTP Office	3626 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Cloudy 53 F
1/9/2020	8:00	Downwind	3626 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Cloudy 53 F
1/9/2020	8:00	Stripper	3626 ACFM	MiniRAE 3000	Kennie Moore	Max. 23.8 ppm Steady State 6.4 ppm	Cloudy 53 F
1/9/2020	13:00	Outside GWTP Office	3618 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Cloudy 64 F
1/9/2020	13:00	Downwind	3618 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Cloudy 64 F
1/9/2020	13:00	Stripper	3618 ACFM	MiniRAE 3000	Kennie Moore	Max. 21.1 ppm Steady State 5.7 ppm	Cloudy 64 F
1/22/2020	13:45	Outside GWTP Office	3759 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Rain 37 F
1/22/2020	13:45	Downwind	3759 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Rain 37 F
1/22/2020	13:45	Stripper	3759 ACFM	MiniRAE 3000	Kennie Moore	Max. 22.2 ppm Steady State 6.5 ppm	Rain 37 F
1/23/2020	8:00	Outside GWTP Office	3985 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Rain 45 F
1/23/2020	8:00	Downwind	3985 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Rain 45 F
1/23/2020	8:00	Stripper	3985 ACFM	MiniRAE 3000	Kennie Moore	Max. 22.1 ppm Steady State 6.3 ppm	Rain 45 F
1/23/2020	13:00	Outside GWTP Office	3710 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Cloudy 47 F
1/23/2020	13:00	Downwind	3710 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Cloudy 47 F
1/23/2020	13:00	Stripper	3710 ACFM	MiniRAE 3000	Kennie Moore	Max. 21.3 ppm Steady State 5.4 ppm	Cloudy 47 F
1/27/2020	8:00	Outside GWTP Office	3842 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 52 F
1/27/2020	8:00	Downwind	3842 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 52 F
1/27/2020	8:00	Stripper	3842 ACFM	MiniRAE 3000	Kennie Moore	Max. 23.4 ppm Steady State 7.9 ppm	Clear 52 F
1/27/2020	14:00	Outside GWTP Office	3677 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 62 F
1/27/2020	14:00	Downwind	3677 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 62 F
1/27/2020	14:00	Stripper	3677 ACFM	MiniRAE 3000	Kennie Moore	Max. 20.2 ppm Steady State 5.5 ppm	Clear 62 F
1/30/2020	8:00	Outside GWTP Office	3760 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Cloudy 44 F
1/30/2020	8:00	Downwind	3760 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Cloudy 44 F
1/30/2020	8:00	Stripper	3760 ACFM	MiniRAE 3000	Kennie Moore	Max. 24.6 ppm Steady State 8.8 ppm	Cloudy 44 F
1/30/2020	13:00	Outside GWTP Office	3789 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Cloudy 47 F

Appendix F Table 3. PID Readings - 1st Quarter 2020
Longhorn Army Ammunition Plant
Groundwater Treatment Plant

Date	Time	Location	Air Flow Rate at Blower	Instrument ID	Person Collecting	PID Reading	Weather Conditions
1/30/2020	13:00	Downwind	3789 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Cloudy 47 F
1/30/2020	13:00	Stripper	3789 ACFM	MiniRAE 3000	Kennie Moore	Max. 21.1 ppm Steady State 6.3 ppm	Cloudy 47 F
2/3/2020	8:00	Outside GWTP Office	3845 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 56 F
2/3/2020	8:00	Downwind	3845 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 56 F
2/3/2020	8:00	Stripper	3845 ACFM	MiniRAE 3000	Kennie Moore	Max. 21.9 ppm Steady State 7.2 ppm	Clear 56 F
2/3/2020	14:00	Outside GWTP Office	3603 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Cloudy 67 F
2/3/2020	14:00	Downwind	3603 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Cloudy 67 F
2/3/2020	14:00	Stripper	3603 ACFM	MiniRAE 3000	Kennie Moore	Max. 23.3 ppm Steady State 7.9 ppm	Cloudy 67 F
2/6/2020	8:00	Outside GWTP Office	3817 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Cloudy 35 F
2/6/2020	8:00	Downwind	3817 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Cloudy 35 F
2/6/2020	8:00	Stripper	3817 ACFM	MiniRAE 3000	Kennie Moore	Max. 24.9 ppm Steady State 8.6 ppm	Cloudy 35 F
2/6/2020	13:00	Outside GWTP Office	3761 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Cloudy 36 F
2/6/2020	13:00	Downwind	3761 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Cloudy 36 F
2/6/2020	13:00	Stripper	3761 ACFM	MiniRAE 3000	Kennie Moore	Max. 20.5 ppm Steady State 6.0 ppm	Cloudy 36 F
2/10/2020	8:00	Outside GWTP Office	3862 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Rain 65 F
2/10/2020	8:00	Downwind	3862 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Rain 65 F
2/10/2020	8:00	Stripper	3862 ACFM	MiniRAE 3000	Kennie Moore	Max. 23.0 ppm Steady State 5.5 ppm	Rain 65 F
2/10/2020	14:00	Outside GWTP Office	3641 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Rain 61 F
2/10/2020	14:00	Downwind	3641 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Rain 61 F
2/10/2020	14:00	Stripper	3641 ACFM	MiniRAE 3000	Kennie Moore	Max. 20.7 ppm Steady State 4.9 ppm	Rain 61 F
2/13/2020	8:00	Outside GWTP Office	3865 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Cloudy 44 F
2/13/2020	8:00	Downwind	3865 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Cloudy 44 F
2/13/2020	8:00	Stripper	3865 ACFM	MiniRAE 3000	Kennie Moore	Max. 22.9 ppm Steady State 6.7 ppm	Cloudy 44 F
2/13/2020	13:00	Outside GWTP Office	3740 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Cloudy 47 F
2/13/2020	13:00	Downwind	3740 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Cloudy 47 F
2/13/2020	13:00	Stripper	3740 ACFM	MiniRAE 3000	Kennie Moore	Max. 21.6 ppm Steady State 5.8 ppm	Cloudy 47 F
2/18/2020	8:00	Outside GWTP Office	3857 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Cloudy 65 F
2/18/2020	8:00	Downwind	3857 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Cloudy 65 F
2/18/2020	8:00	Stripper	3857 ACFM	MiniRAE 3000	Kennie Moore	Max. 24.2 ppm Steady State 8.8 ppm	Cloudy 65 F
2/18/2020	14:00	Outside GWTP Office	3518 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Overcast 64 F
2/18/2020	14:00	Downwind	3518 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Overcast 64 F
2/18/2020	14:00	Stripper	3518 ACFM	MiniRAE 3000	Kennie Moore	Max. 21.7 ppm Steady State 5.9 ppm	Overcast 64 F
2/20/2020	8:00	Outside GWTP Office	3857 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Rain 41 F
2/20/2020	8:00	Downwind	3857 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Rain 41 F
2/20/2020	8:00	Stripper	3857 ACFM	MiniRAE 3000	Kennie Moore	Max. 22.4 ppm Steady State 5.6 ppm	Rain 41 F
2/20/2020	11:30	Outside GWTP Office	3750 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Cloudy 46 F
2/20/2020	11:30	Downwind	3750 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Cloudy 46 F
2/20/2020	11:30	Stripper	3750 ACFM	MiniRAE 3000	Kennie Moore	Max. 20.8 ppm Steady State 5.1 ppm	Cloudy 46 F

Appendix F Table 3. PID Readings - 1st Quarter 2020
Longhorn Army Ammunition Plant
Groundwater Treatment Plant

Date	Time	Location	Air Flow Rate at Blower	Instrument ID	Person Collecting	PID Reading	Weather Conditions
2/24/2020	8:00	Outside GWTP Office	3468 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Cloudy 61 F
2/24/2020	8:00	Downwind	3468 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Cloudy 61 F
2/24/2020	8:00	Stripper	3468 ACFM	MiniRAE 3000	Kennie Moore	Max. 24.9 ppm Steady State 6.6 ppm	Cloudy 61 F
2/24/2020	14:00	Outside GWTP Office	3506 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 69 F
2/24/2020	14:00	Downwind	3506 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 69 F
2/24/2020	14:00	Stripper	3506 ACFM	MiniRAE 3000	Kennie Moore	Max. 21.5 ppm Steady State 5.5 ppm	Clear 69 F
2/27/2020	9:00	Outside GWTP Office	3692 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 36 F
2/27/2020	9:00	Downwind	3692 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 36 F
2/27/2020	9:00	Stripper	3692 ACFM	MiniRAE 3000	Kennie Moore	Max. 23.6 ppm Steady State 5.1 ppm	Clear 36 F
2/27/2020	14:00	Outside GWTP Office	3764 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 51 F
2/27/2020	14:00	Downwind	3764 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 51 F
2/27/2020	14:00	Stripper	3764 ACFM	MiniRAE 3000	Kennie Moore	Max. 21.1 ppm Steady State 4.8 ppm	Clear 51 F
3/3/2020	8:00	Outside GWTP Office	3491 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Cloudy 63 F
3/3/2020	8:00	Downwind	3491 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Cloudy 63 F
3/3/2020	8:00	Stripper	3491 ACFM	MiniRAE 3000	Kennie Moore	Max. 20.4 ppm Steady State 4.7 ppm	Cloudy 63 F
3/3/2020	14:00	Outside GWTP Office	3378 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Cloudy 71 F
3/3/2020	14:00	Downwind	3378 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Cloudy 71 F
3/3/2020	14:00	Stripper	3378 ACFM	MiniRAE 3000	Kennie Moore	Max. 23.1 ppm Steady State 5.9 ppm	Cloudy 71 F
3/9/2020	8:00	Outside GWTP Office	3795 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Cloudy 60 F
3/9/2020	8:00	Downwind	3795 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Cloudy 60 F
3/9/2020	8:00	Stripper	3795 ACFM	MiniRAE 3000	Kennie Moore	Max. 22.6 ppm Steady State 6.1 ppm	Cloudy 60 F
3/9/2020	14:00	Outside GWTP Office	3460 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Cloudy 64 F
3/9/2020	14:00	Downwind	3460 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Cloudy 64 F
3/9/2020	14:00	Stripper	3460 ACFM	MiniRAE 3000	Kennie Moore	Max. 21.3 ppm Steady State 5.3 ppm	Cloudy 64 F
3/12/2020	8:00	Outside GWTP Office	3565 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Cloudy 66 F
3/12/2020	8:00	Downwind	3565 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Cloudy 66 F
3/12/2020	8:00	Stripper	3565 ACFM	MiniRAE 3000	Kennie Moore	Max. 22.8 ppm Steady State 6.4 ppm	Cloudy 66 F
3/12/2020	13:00	Outside GWTP Office	3340 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 78 F
3/12/2020	13:00	Downwind	3640 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 78 F
3/12/2020	13:00	Stripper	3340 ACFM	MiniRAE 3000	Kennie Moore	Max. 21.9 ppm Steady State 5.2 ppm	Clear 78 F
3/16/2020	8:00	Outside GWTP Office	3980 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Cloudy 49 F
3/16/2020	8:00	Downwind	3980 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Cloudy 49 F
3/16/2020	8:00	Stripper	3980 ACFM	MiniRAE 3000	Kennie Moore	Max. 23.1 ppm Steady State 6.7 ppm	Cloudy 49 F
3/16/2020	14:00	Outside GWTP Office	3715 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Cloudy 55 F
3/16/2020	14:00	Downwind	3715 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Cloudy 55 F
3/16/2020	14:00	Stripper	3715 ACFM	MiniRAE 3000	Kennie Moore	Max. 22.3 ppm Steady State 5.2 ppm	Cloudy 55 F

Appendix F Table 3. PID Readings - 1st Quarter 2020
Longhorn Army Ammunition Plant
Groundwater Treatment Plant

Date	Time	Location	Air Flow Rate at Blower	Instrument ID	Person Collecting	PID Reading	Weather Conditions
3/19/2020	8:00	Outside GWTP Office	3447 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Cloudy 70 F
3/19/2020	8:00	Downwind	3447 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Cloudy 70 F
3/19/2020	8:00	Stripper	3447 ACFM	MiniRAE 3000	Kennie Moore	Max. 23.8 ppm Steady State 7.1 ppm	Cloudy 70 F
3/19/2020	12:30	Outside GWTP Office	3321 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Cloudy 72 F
3/19/2020	12:30	Downwind	3321 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Cloudy 72 F
3/19/2020	12:30	Stripper	3321 ACFM	MiniRAE 3000	Kennie Moore	Max. 21.6 ppm Steady State 6.2 ppm	Cloudy 72 F
3/23/2020	8:00	Outside GWTP Office	3569 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Rain 56 F
3/23/2020	8:00	Downwind	3569 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Rain 56 F
3/23/2020	8:00	Stripper	3569 ACFM	MiniRAE 3000	Kennie Moore	Max. 22.2 ppm Steady State 5.1 ppm	Rain 56 F
3/23/2020	14:00	Outside GWTP Office	3602 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Rain 63 F
3/23/2020	14:00	Downwind	3602 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Rain 63 F
3/23/2020	14:00	Stripper	3602 ACFM	MiniRAE 3000	Kennie Moore	Max. 24.1 ppm Steady State 6.6 ppm	Rain 63 F
3/26/2020	8:00	Outside GWTP Office	3521 ACFM	MiniRAE 3000	Scott Beesinger	0.0 ppm	Clear 66 F
3/26/2020	8:00	Downwind	3521 ACFM	MiniRAE 3000	Scott Beesinger	0.0 ppm	Clear 66 F
3/26/2020	8:00	Stripper	3521 ACFM	MiniRAE 3000	Scott Beesinger	Max. 21.6 ppm Steady State 4.8 ppm	Clear 66 F
3/26/2020	13:00	Outside GWTP Office	3489 ACFM	MiniRAE 3000	Scott Beesinger	0.0 ppm	Clear 86 F
3/26/2020	13:00	Downwind	3489 ACFM	MiniRAE 3000	Scott Beesinger	0.0 ppm	Clear 86 F
3/26/2020	13:00	Stripper	3489 ACFM	MiniRAE 3000	Scott Beesinger	Max. 22.9 ppm Steady State 5.5 ppm	Clear 86 F
3/30/2020	8:00	Outside GWTP Office	3855 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Cloudy 61 F
3/30/2020	8:00	Downwind	3855 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Cloudy 61 F
3/30/2020	8:00	Stripper	3855 ACFM	MiniRAE 3000	Kennie Moore	Max. 23.4 ppm Steady State 6.1 ppm	Cloudy 61 F
3/30/2020	14:00	Outside GWTP Office	3650 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Rain 60 F
3/30/2020	14:00	Downwind	3650 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Rain 60 F
3/30/2020	14:00	Stripper	3650 ACFM	MiniRAE 3000	Kennie Moore	Max. 21.7 ppm Steady State 5.3 ppm	Rain 60 F

00968376

EQUIPMENT CALIBRATION DAILY LOG

Date: 1/6/20

Project Number: NWO 1312.0150

Project Name: LHAAP - GWTP

Recorded By: Scott Beesinger

					Morning Calibration	Evening Check	Additional Calib./Check (if necessary)
PID	Model: mini RAE 3000	Bulb: 10.6 meV					
	Equipment ID #: PGM 7320						
	Parameter	Standard	Exp. Date	Lot #	Time: 06:30	Time:	Time:
					Initials: SB	Initials:	Initials:
First Point Calibration	Vapor conc. (ppm)	0.0 (ambient air)	NA	NA	Value: TO ZERO SB	Value:	Value:
Second Point Calibration	Vapor conc. (ppm)	100 ppm (isobutylene)	10/5/21	JBH-248-100-19	Value: SB	Value:	Value:

					Morning Calibration	Evening Check	Additional Calib./Check (if necessary)
COMB. GAS/O_2 METER	Model:						
	Equipment ID #:						
	Parameter	Standard	Exp. Date	Lot #	Time:	Time:	Time:
					Initials:	Initials:	Initials:
First Point Calibration	O2 (%)				Value:	Value:	Value:
	% LEL Pentane				Value:	Value:	Value:

					Morning Calibration/Check	Evening Check (one point only)	Additional Calib./Check (if necessary)
WATER QUALITY METER	Model:						
	Equipment ID #:						
	Parameter	Standard	Exp. Date	Lot #	Time:	Time:	Time:
					Initials:	Initials:	Initials:
First Point Calibration (Auto)	pH	4.00			Value:	Value:	Value:
	Conductivity (mS/cm)	4.49			Value:	Value:	Value:
	Turbidity (NTU)	0			Value:	Value:	Value:
	DO (mg/L)	8.9-9.1 (ambient air)	NA	NA	Value:	Value:	Value:
Second Point Calibration	pH	6.86			Value:	Value:	Value:
	Conductivity (mS/cm)	53.7			Value:	Value:	Value:
	Turbidity (NTU)	100			Value:	Value:	Value:
Third Point Calibration	pH	9.18			Value:	Value:	Value:
	Conductivity (mS/cm)	53.7			Value:	Value:	Value:
	Turbidity (NTU)	100			Value:	Value:	Value:

Additional Remarks:

00968377

EQUIPMENT CALIBRATION DAILY LOG

Date: 1/9/20

Project Number: NWO 1312.0150

Project Name: LHAAP - GWTP

Recorded By: Scott Beesinger

PID

Model: MiniRAE 3000 Bulb: 10.6 eV

Equipment ID #: PGM 7320

	Parameter	Standard	Exp. Date	Lot #	Morning Calibration	Evening Check	Additional Calib./Check (if necessary)
					Time: 07:20	Time:	Time:
					Initials: SB	Initials:	Initials:
First Point Calibration	Vapor conc. (ppm)	0.0 (ambient air)	NA	NA	Value: To zero SB	Value:	Value:
Second Point Calibration	Vapor conc. (ppm)	100 ppm (isobutylene)	10/5/21	JBH-248-100-19	Value: SB	Value:	Value:

COMB. GAS/O_2 METER

Model:

Equipment ID #:

	Parameter	Standard	Exp. Date	Lot #	Morning Calibration	Evening Check	Additional Calib./Check (if necessary)
					Time:	Time:	Time:
					Initials:	Initials:	Initials:
First Point Calibration	O2 (%)				Value:	Value:	Value:
	% LEL Pentane				Value:	Value:	Value:

WATER QUALITY METER

Model:

Equipment ID #:

	Parameter	Standard	Exp. Date	Lot #	Morning Calibration/Check	Evening Check (one point only)	Additional Calib./Check (if necessary)
					Time:	Time:	Time:
					Initials:	Initials:	Initials:
First Point Calibration (Auto)	pH	4.00			Value:	Value:	Value:
	Conductivity (mS/cm)	4.49			Value:	Value:	Value:
	Turbidity (NTU)	0			Value:	Value:	Value:
	DO (mg/L)	8.9-9.1 (ambient air)	NA	NA	Value:	Value:	Value:
Second Point Calibration	pH	6.86			Value:	Value:	Value:
	Conductivity (mS/cm)	53.7			Value:	Value:	Value:
	Turbidity (NTU)	100			Value:	Value:	Value:
Third Point Calibration	pH	9.18			Value:	Value:	Value:
	Conductivity (mS/cm)	53.7			Value:	Value:	Value:
	Turbidity (NTU)	100			Value:	Value:	Value:

Additional Remarks:

00968378

EQUIPMENT CALIBRATION DAILY LOG

Date: 1/23/20

Project Number: NWO 1312.0150

Project Name: LHAAP - GWTP

Recorded By: Scott Beesinger

PID

Model: mini RAE 3000 Bulb: 10.6 eV

Equipment ID #: PGM 7320

	Parameter	Standard	Exp. Date	Lot #	Morning Calibration	Evening Check	Additional Calib./Check (if necessary)
					Time: 06:40	Time:	Time:
					Initials: SB	Initials:	Initials:
First Point Calibration	Vapor conc. (ppm)	0.0 (ambient air)	NA	NA	Value: TO ZERO SB	Value:	Value:
Second Point Calibration	Vapor conc. (ppm)	100 ppm (isobutylene)	10/5/21	JBH-248-100-19	Value: SB	Value:	Value:

COMB. GAS/O_2 METER

Model:

Equipment ID #:

	Parameter	Standard	Exp. Date	Lot #	Morning Calibration	Evening Check	Additional Calib./Check (if necessary)
					Time:	Time:	Time:
					Initials:	Initials:	Initials:
First Point Calibration	O2 (%)				Value:	Value:	Value:
	% LEL Pentane				Value:	Value:	Value:

WATER QUALITY METER

Model:

Equipment ID #:

	Parameter	Standard	Exp. Date	Lot #	Morning Calibration/Check	Evening Check (one point only)	Additional Calib./Check (if necessary)
					Time:	Time:	Time:
					Initials:	Initials:	Initials:
First Point Calibration (Auto)	pH	4.00			Value:	Value:	Value:
	Conductivity (mS/cm)	4.49			Value:	Value:	Value:
	Turbidity (NTU)	0			Value:	Value:	Value:
	DO (mg/L)	8.9-9.1 (ambient air)	NA	NA	Value:	Value:	Value:
Second Point Calibration	pH	6.86			Value:	Value:	Value:
	Conductivity (mS/cm)	53.7			Value:	Value:	Value:
	Turbidity (NTU)	100			Value:	Value:	Value:
Third Point Calibration	pH	9.18			Value:	Value:	Value:
	Conductivity (mS/cm)	53.7			Value:	Value:	Value:
	Turbidity (NTU)	100			Value:	Value:	Value:

Additional Remarks:

00968379

EQUIPMENT CALIBRATION DAILY LOG

Date: 1/27/20

Project Number: NWO 1312.0150

Project Name: LHAAP - GWTP

Recorded By: Scott Beesinger

PID

Model: mini RAE 3000 Bulb: 10.6 eV

Equipment ID #: PGM 7320

	Parameter	Standard	Exp. Date	Lot #	Morning Calibration	Evening Check	Additional Calib./Check (if necessary)
					Time: 0621	Time:	Time:
					Initials: SB	Initials:	Initials:
First Point Calibration	Vapor conc. (ppm)	0.0 (ambient air)	NA	NA	Value: TO ZERO SB	Value:	Value:
Second Point Calibration	Vapor conc. (ppm)	100 ppm (isobutylene)	10/5/21	JBH-248-100-19	Value: SB	Value:	Value:

COMB. GAS/O_2 METER

Model:

Equipment ID #:

	Parameter	Standard	Exp. Date	Lot #	Morning Calibration	Evening Check	Additional Calib./Check (if necessary)
					Time:	Time:	Time:
					Initials:	Initials:	Initials:
First Point Calibration	O2 (%)				Value:	Value:	Value:
	% LEL Pentane				Value:	Value:	Value:

WATER QUALITY METER

Model:

Equipment ID #:

	Parameter	Standard	Exp. Date	Lot #	Morning Calibration/Check	Evening Check (one point only)	Additional Calib./Check (if necessary)
					Time:	Time:	Time:
					Initials:	Initials:	Initials:
First Point Calibration (Auto)	pH	4.00			Value:	Value:	Value:
	Conductivity (mS/cm)	4.49			Value:	Value:	Value:
	Turbidity (NTU)	0			Value:	Value:	Value:
	DO (mg/L)	8.9-9.1 (ambient air)	NA	NA	Value:	Value:	Value:
Second Point Calibration	pH	6.86			Value:	Value:	Value:
	Conductivity (mS/cm)	53.7			Value:	Value:	Value:
	Turbidity (NTU)	100			Value:	Value:	Value:
Third Point Calibration	pH	9.18			Value:	Value:	Value:
	Conductivity (mS/cm)	53.7			Value:	Value:	Value:
	Turbidity (NTU)	100			Value:	Value:	Value:

Additional Remarks:

00968380

EQUIPMENT CALIBRATION DAILY LOG

Date: 1/30/20

Project Number: NWO 1312.0150

Project Name: LHAAP - GWTP

Recorded By: Scott Beesinger

PID

Model: Mini Rae 3000 Bulb: 10.6 eV

Equipment ID #: PGM 7320

	Parameter	Standard	Exp. Date	Lot #	Morning Calibration	Evening Check	Additional Calib./Check (if necessary)
					Time: 07:45	Time:	Time:
					Initials: SB	Initials:	Initials:
First Point Calibration	Vapor conc. (ppm)	0.0 (ambient air)	NA	NA	Value: To ZERO SB	Value:	Value:
Second Point Calibration	Vapor conc. (ppm)	100 ppm (isobutylene)	10/5/21	JBH-248-100-19	Value: SB	Value:	Value:

COMB. GAS/O_2 METER

Model:

Equipment ID #:

	Parameter	Standard	Exp. Date	Lot #	Morning Calibration	Evening Check	Additional Calib./Check (if necessary)
					Time:	Time:	Time:
					Initials:	Initials:	Initials:
First Point Calibration	O2 (%)				Value:	Value:	Value:
	% LEL Pentane				Value:	Value:	Value:

WATER QUALITY METER

Model:

Equipment ID #:

	Parameter	Standard	Exp. Date	Lot #	Morning Calibration/Check	Evening Check (one point only)	Additional Calib./Check (if necessary)
					Time:	Time:	Time:
					Initials:	Initials:	Initials:
First Point Calibration (4/4/0)	pH	4.00			Value:	Value:	Value:
	Conductivity (mS/cm)	4.49			Value:	Value:	Value:
	Turbidity (NTU)	0			Value:	Value:	Value:
	DO (mg/L)	8.9-9.1 (ambient air)	NA	NA	Value:	Value:	Value:
Second Point Calibration	pH	6.86			Value:	Value:	Value:
	Conductivity (mS/cm)	53.7			Value:	Value:	Value:
	Turbidity (NTU)	100			Value:	Value:	Value:
Third Point Calibration	pH	9.18			Value:	Value:	Value:
	Conductivity (mS/cm)	53.7			Value:	Value:	Value:
	Turbidity (NTU)	100			Value:	Value:	Value:

Additional Remarks:

00968381

EQUIPMENT CALIBRATION DAILY LOG

Date: 2/3/20

Project Number: NWO 1312.0150

Project Name: LHAAP - GWTP

Recorded By: Scott Beesinger

PID

Model: MiniRAE 3000 Bulb: 10.6 eV

Equipment ID #: PGM 7320

	Parameter	Standard	Exp. Date	Lot #	Morning Calibration	Evening Check	Additional Calib./Check (if necessary)
					Time: 06:30	Time:	Time:
					Initials: SB	Initials:	Initials:
First Point Calibration	Vapor conc. (ppm)	0.0 (ambient air)	NA	NA	Value: TO ZERO SB	Value:	Value:
Second Point Calibration	Vapor conc. (ppm)	100 ppm (isobutylene)	10/5/21	JBH-248-100-19	Value: SB	Value:	Value:

COMB. GAS/O_2 METER

Model:

Equipment ID #:

	Parameter	Standard	Exp. Date	Lot #	Morning Calibration	Evening Check	Additional Calib./Check (if necessary)
					Time:	Time:	Time:
					Initials:	Initials:	Initials:
First Point Calibration	O2 (%)				Value:	Value:	Value:
	% LEL Pentane				Value:	Value:	Value:

WATER QUALITY METER

Model:

Equipment ID #:

	Parameter	Standard	Exp. Date	Lot #	Morning Calibration/Check	Evening Check (one point only)	Additional Calib./Check (if necessary)
					Time:	Time:	Time:
					Initials:	Initials:	Initials:
First Point Calibration (Auto)	pH	4.00			Value:	Value:	Value:
	Conductivity (mS/cm)	4.49			Value:	Value:	Value:
	Turbidity (NTU)	0			Value:	Value:	Value:
	DO (mg/L)	8.9-9.1 (ambient air)	NA	NA	Value:	Value:	Value:
Second Point Calibration	pH	6.86			Value:	Value:	Value:
	Conductivity (mS/cm)	53.7			Value:	Value:	Value:
	Turbidity (NTU)	100			Value:	Value:	Value:
Third Point Calibration	pH	9.18			Value:	Value:	Value:
	Conductivity (mS/cm)	53.7			Value:	Value:	Value:
	Turbidity (NTU)	100			Value:	Value:	Value:

Additional Remarks:

00968382

EQUIPMENT CALIBRATION DAILY LOG

Date: 2/6/20

Project Number: NWO 1312.0150

Project Name: LHAAP - GWTP

Recorded By: Scott Beesinger

					Morning Calibration	Evening Check	Additional Calib./Check (if necessary)
PID	Model: Mini RAE 3000		Bulb: 10.6 eV				
	Equipment ID #: PGM 7320						
	Parameter	Standard	Exp. Date	Lot #	Time: 07:20	Time:	Time:
					Initials: SB	Initials:	Initials:
First Point Calibration	Vapor conc. (ppm)	0.0 (ambient air)	NA	NA	Value: To ZERO SB	Value:	Value:
Second Point Calibration	Vapor conc. (ppm)	100 ppm (isobutylene)	10/5/21	JBH-248-100-19	Value: SB	Value:	Value:

					Morning Calibration	Evening Check	Additional Calib./Check (if necessary)
COMB. GAS/O_2 METER	Model:						
	Equipment ID #:						
	Parameter	Standard	Exp. Date	Lot #	Time:	Time:	Time:
					Initials:	Initials:	Initials:
First Point Calibration	O2 (%)				Value:	Value:	Value:
	% LEL Pentane				Value:	Value:	Value:

					Morning Calibration/Check	Evening Check (one point only)	Additional Calib./Check (if necessary)
WATER QUALITY METER	Model:						
	Equipment ID #:						
	Parameter	Standard	Exp. Date	Lot #	Time:	Time:	Time:
					Initials:	Initials:	Initials:
First Point Calibration (Auto)	pH	4.00			Value:	Value:	Value:
	Conductivity (mS/cm)	4.49			Value:	Value:	Value:
	Turbidity (NTU)	0			Value:	Value:	Value:
	DO (mg/L)	8.9-9.1 (ambient air)	NA	NA	Value:	Value:	Value:
Second Point Calibration	pH	6.86			Value:	Value:	Value:
	Conductivity (mS/cm)	53.7			Value:	Value:	Value:
	Turbidity (NTU)	100			Value:	Value:	Value:
Third Point Calibration	pH	9.18			Value:	Value:	Value:
	Conductivity (mS/cm)	53.7			Value:	Value:	Value:
	Turbidity (NTU)	100			Value:	Value:	Value:

Additional Remarks:

00968383

EQUIPMENT CALIBRATION DAILY LOG

Date: 2/10/20

Project Number: NWO 1312.0150

Project Name: LHAAP - GWTP

Recorded By: Scott Beesinger

PID

Model: MiniRAE 3000 Bulb: 10.6 eV

Equipment ID #: PGM 7320

	Parameter	Standard	Exp. Date	Lot #	Morning Calibration	Evening Check	Additional Calib./Check (if necessary)
					Time: 06:35	Time:	Time:
					Initials: SB	Initials:	Initials:
First Point Calibration	Vapor conc. (ppm)	0.0 (ambient air)	NA	NA	Value: TO ZERO SB	Value:	Value:
Second Point Calibration	Vapor conc. (ppm)	100 ppm (isobutylene)	10/5/21	JBH-248-100-19	Value: SB	Value:	Value:

COMB. GAS/O_2 METER

Model:

Equipment ID #:

	Parameter	Standard	Exp. Date	Lot #	Morning Calibration	Evening Check	Additional Calib./Check (if necessary)
					Time:	Time:	Time:
					Initials:	Initials:	Initials:
First Point Calibration	O2 (%)				Value:	Value:	Value:
	% LEL Pentane				Value:	Value:	Value:

WATER QUALITY METER

Model:

Equipment ID #:

	Parameter	Standard	Exp. Date	Lot #	Morning Calibration/Check	Evening Check (one point only)	Additional Calib./Check (if necessary)
					Time:	Time:	Time:
					Initials:	Initials:	Initials:
First Point Calibration (Auto)	pH	4.00			Value:	Value:	Value:
	Conductivity (mS/cm)	4.49			Value:	Value:	Value:
	Turbidity (NTU)	0			Value:	Value:	Value:
	DO (mg/L)	8.9-9.1 (ambient air)	NA	NA	Value:	Value:	Value:
Second Point Calibration	pH	6.86			Value:	Value:	Value:
	Conductivity (mS/cm)	53.7			Value:	Value:	Value:
	Turbidity (NTU)	100			Value:	Value:	Value:
Third Point Calibration	pH	9.18			Value:	Value:	Value:
	Conductivity (mS/cm)	53.7			Value:	Value:	Value:
	Turbidity (NTU)	100			Value:	Value:	Value:

Additional Remarks:

00968384

EQUIPMENT CALIBRATION DAILY LOG

Date: 2/13/20

Project Number: NWO 1312.0150

Project Name: LHAAP - GWTP

Recorded By: Scott Beesinger

PID

Model: MiniRae 3000 Bulb: 10.6 eV

Equipment ID #: PGM 7320

	Parameter	Standard	Exp. Date	Lot #	Morning Calibration	Evening Check	Additional Calib./Check (if necessary)
					Time: 07:30	Time:	Time:
					Initials: SB	Initials:	Initials:
First Point Calibration	Vapor conc. (ppm)	0.0 (ambient air)	NA	NA	Value: To ZERO SB	Value:	Value:
Second Point Calibration	Vapor conc. (ppm)	100 ppm (isobutylene)	10/5/21	JBH-248-100-19	Value: SB	Value:	Value:

COMB. GAS/O_2 METER

Model:

Equipment ID #:

	Parameter	Standard	Exp. Date	Lot #	Morning Calibration	Evening Check	Additional Calib./Check (if necessary)
					Time:	Time:	Time:
					Initials:	Initials:	Initials:
First Point Calibration	O2 (%)				Value:	Value:	Value:
	% LEL Pentane				Value:	Value:	Value:

WATER QUALITY METER

Model:

Equipment ID #:

	Parameter	Standard	Exp. Date	Lot #	Morning Calibration/Check	Evening Check (one point only)	Additional Calib./Check (if necessary)
					Time:	Time:	Time:
					Initials:	Initials:	Initials:
First Point Calibration (Auto)	pH	4.00			Value:	Value:	Value:
	Conductivity (mS/cm)	4.49			Value:	Value:	Value:
	Turbidity (NTU)	0			Value:	Value:	Value:
	DO (mg/L)	8.9-9.1 (ambient air)	NA	NA	Value:	Value:	Value:
Second Point Calibration	pH	6.86			Value:	Value:	Value:
	Conductivity (mS/cm)	53.7			Value:	Value:	Value:
	Turbidity (NTU)	100			Value:	Value:	Value:
Third Point Calibration	pH	9.18			Value:	Value:	Value:
	Conductivity (mS/cm)	53.7			Value:	Value:	Value:
	Turbidity (NTU)	100			Value:	Value:	Value:

Additional Remarks:

00968385

EQUIPMENT CALIBRATION DAILY LOG

Date: 2/18/20

Project Number: NWO 1312.0150

Project Name: LHAAP - GWTP

Recorded By: Scott Beesinger

PID

Model: Mini RAE 3000 Bulb: 10.7 eV

Equipment ID #: PGM 7320

	Parameter	Standard	Exp. Date	Lot #	Morning Calibration	Evening Check	Additional Calib./Check (if necessary)
					Time: 06:20	Time:	Time:
					Initials: SB	Initials:	Initials:
First Point Calibration	Vapor conc. (ppm)	0.0 (ambient air)	NA	NA	Value: TO ZERO SB	Value:	Value:
Second Point Calibration	Vapor conc. (ppm)	100 ppm (isobutylene)	10/5/21	JBH-248-100-19	Value: SB	Value:	Value:

COMB. GAS/O_2 METER

Model:

Equipment ID #:

	Parameter	Standard	Exp. Date	Lot #	Morning Calibration	Evening Check	Additional Calib./Check (if necessary)
					Time:	Time:	Time:
					Initials:	Initials:	Initials:
First Point Calibration	O2 (%)				Value:	Value:	Value:
	% LEL Pentane				Value:	Value:	Value:

WATER QUALITY METER

Model:

Equipment ID #:

	Parameter	Standard	Exp. Date	Lot #	Morning Calibration/Check	Evening Check (one point only)	Additional Calib./Check (if necessary)
					Time:	Time:	Time:
					Initials:	Initials:	Initials:
First Point Calibration (Auto)	pH	4.00			Value:	Value:	Value:
	Conductivity (mS/cm)	4.49			Value:	Value:	Value:
	Turbidity (NTU)	0			Value:	Value:	Value:
	DO (mg/L)	8.9-9.1 (ambient air)	NA	NA	Value:	Value:	Value:
Second Point Calibration	pH	6.86			Value:	Value:	Value:
	Conductivity (mS/cm)	53.7			Value:	Value:	Value:
	Turbidity (NTU)	100			Value:	Value:	Value:
Third Point Calibration	pH	9.18			Value:	Value:	Value:
	Conductivity (mS/cm)	53.7			Value:	Value:	Value:
	Turbidity (NTU)	100			Value:	Value:	Value:

Additional Remarks:

00968386

EQUIPMENT CALIBRATION DAILY LOG

Date: 2/20/20

Project Number: NWO 1312.0150

Project Name: LHAAP - GWTP

Recorded By: Scott Beesinger

PID

Model: mini Rae 3000 Bulb: 10.7 eV

Equipment ID #: PGM 7320

	Parameter	Standard	Exp. Date	Lot #	Morning Calibration	Evening Check	Additional Calib./Check (if necessary)
					Time: 07:15	Time:	Time:
					Initials: SB	Initials:	Initials:
First Point Calibration	Vapor conc. (ppm)	0.0 (ambient air)	NA	NA	Value: TO ZERO SB	Value:	Value:
Second Point Calibration	Vapor conc. (ppm)	100 ppm (isobutylene)	10/5/21	JBH-248-100-19	Value: SB	Value:	Value:

COMB. GAS/O_2 METER

Model:

Equipment ID #:

	Parameter	Standard	Exp. Date	Lot #	Morning Calibration	Evening Check	Additional Calib./Check (if necessary)
					Time:	Time:	Time:
					Initials:	Initials:	Initials:
First Point Calibration	O2 (%)				Value:	Value:	Value:
	% LEL Pentane				Value:	Value:	Value:

WATER QUALITY METER

Model:

Equipment ID #:

	Parameter	Standard	Exp. Date	Lot #	Morning Calibration/Check	Evening Check (one point only)	Additional Calib./Check (if necessary)
					Time:	Time:	Time:
					Initials:	Initials:	Initials:
First Point Calibration (Auto)	pH	4.00			Value:	Value:	Value:
	Conductivity (mS/cm)	4.49			Value:	Value:	Value:
	Turbidity (NTU)	0			Value:	Value:	Value:
	DO (mg/L)	8.9-9.1 (ambient air)	NA	NA	Value:	Value:	Value:
Second Point Calibration	pH	6.86			Value:	Value:	Value:
	Conductivity (mS/cm)	53.7			Value:	Value:	Value:
	Turbidity (NTU)	100			Value:	Value:	Value:
Third Point Calibration	pH	9.18			Value:	Value:	Value:
	Conductivity (mS/cm)	53.7			Value:	Value:	Value:
	Turbidity (NTU)	100			Value:	Value:	Value:

Additional Remarks:

00968387

EQUIPMENT CALIBRATION DAILY LOG

Date: 2/29/20

Project Number: NWO 1312.0150

Project Name: LHAAP - GWTP

Recorded By: Scott Beesinger

PID

Model: Mini RAE 3000 Bulb: 10.6 eV

Equipment ID #: PGM 7320

	Parameter	Standard	Exp. Date	Lot #	Morning Calibration	Evening Check	Additional Calib./Check (if necessary)
					Time: 06:50	Time:	Time:
					Initials: SB	Initials:	Initials:
First Point Calibration	Vapor conc. (ppm)	0.0 (ambient air)	NA	NA	Value: TO ZERO SB	Value:	Value:
Second Point Calibration	Vapor conc. (ppm)	100 ppm (isobutylene)	10/5/21	JBH-248-100-19	Value: SB	Value:	Value:

COMB. GAS/O_2 METER

Model:

Equipment ID #:

	Parameter	Standard	Exp. Date	Lot #	Morning Calibration	Evening Check	Additional Calib./Check (if necessary)
					Time:	Time:	Time:
					Initials:	Initials:	Initials:
First Point Calibration	O2 (%)				Value:	Value:	Value:
	% LEL Pentane				Value:	Value:	Value:

WATER QUALITY METER

Model:

Equipment ID #:

	Parameter	Standard	Exp. Date	Lot #	Morning Calibration/Check	Evening Check (one point only)	Additional Calib./Check (if necessary)
					Time:	Time:	Time:
					Initials:	Initials:	Initials:
First Point Calibration (Auto)	pH	4.00			Value:	Value:	Value:
	Conductivity (mS/cm)	4.49			Value:	Value:	Value:
	Turbidity (NTU)	0			Value:	Value:	Value:
	DO (mg/L)	8.9-9.1 (ambient air)	NA	NA	Value:	Value:	Value:
Second Point Calibration	pH	6.86			Value:	Value:	Value:
	Conductivity (mS/cm)	53.7			Value:	Value:	Value:
	Turbidity (NTU)	100			Value:	Value:	Value:
Third Point Calibration	pH	9.18			Value:	Value:	Value:
	Conductivity (mS/cm)	53.7			Value:	Value:	Value:
	Turbidity (NTU)	100			Value:	Value:	Value:

Additional Remarks:

00968388

EQUIPMENT CALIBRATION DAILY LOG

Date: 2/27/20

Project Number: NWO 1312.0150

Project Name: LHAAP - GWTP

Recorded By: Scott BEESINGER

PID

Model: Mini Rae 3000 Bulb: 10.7 eV

Equipment ID #: PGM 7320

	Parameter	Standard	Exp. Date	Lot #	Morning Calibration	Evening Check	Additional Calib./Check (if necessary)
					Time: 08:50	Time:	Time:
					Initials: SB	Initials:	Initials:
First Point Calibration	Vapor conc. (ppm)	0.0 (ambient air)	NA	NA	Value: TO ZERO SB	Value:	Value:
Second Point Calibration	Vapor conc. (ppm)	100 ppm (isobutylene)	10/5/21	JBH-248-100-19	Value: SB	Value:	Value:

COMB. GAS/O_2 METER

Model:

Equipment ID #:

	Parameter	Standard	Exp. Date	Lot #	Morning Calibration	Evening Check	Additional Calib./Check (if necessary)
					Time:	Time:	Time:
					Initials:	Initials:	Initials:
First Point Calibration	O2 (%)				Value:	Value:	Value:
	% LEL Pentane				Value:	Value:	Value:

WATER QUALITY METER

Model:

Equipment ID #:

	Parameter	Standard	Exp. Date	Lot #	Morning Calibration/Check	Evening Check (one point only)	Additional Calib./Check (if necessary)
					Time:	Time:	Time:
					Initials:	Initials:	Initials:
First Point Calibration (Auto)	pH	4.00			Value:	Value:	Value:
	Conductivity (mS/cm)	4.49			Value:	Value:	Value:
	Turbidity (NTU)	0			Value:	Value:	Value:
	DO (mg/L)	8.9-9.1 (ambient air)	NA	NA	Value:	Value:	Value:
Second Point Calibration	pH	6.86			Value:	Value:	Value:
	Conductivity (mS/cm)	53.7			Value:	Value:	Value:
	Turbidity (NTU)	100			Value:	Value:	Value:
Third Point Calibration	pH	9.18			Value:	Value:	Value:
	Conductivity (mS/cm)	53.7			Value:	Value:	Value:
	Turbidity (NTU)	100			Value:	Value:	Value:

Additional Remarks:

00968389

EQUIPMENT CALIBRATION DAILY LOG

Date: 3/3/20

Project Number: NWO 1312.0150

Project Name: LHAAP - GWTP

Recorded By: Scott Beesinger

PID

Model: MiniRAE 3000 Bulb: 10.6 meV

Equipment ID #: PGM 7320

	Parameter	Standard	Exp. Date	Lot #	Morning Calibration	Evening Check	Additional Calib./Check (if necessary)
					Time: 06:30	Time:	Time:
					Initials: SB	Initials:	Initials:
First Point Calibration	Vapor conc. (ppm)	0.0 (ambient air)	NA	NA	Value: TO ZERO SB	Value:	Value:
Second Point Calibration	Vapor conc. (ppm)	100 ppm (isobutylene)	10/5/21	JBH-248-100-19	Value: SB	Value:	Value:

COMB. GAS/O_2 METER

Model:

Equipment ID #:

	Parameter	Standard	Exp. Date	Lot #	Morning Calibration	Evening Check	Additional Calib./Check (if necessary)
					Time:	Time:	Time:
					Initials:	Initials:	Initials:
First Point Calibration	O2 (%)				Value:	Value:	Value:
	% LEL Pentane				Value:	Value:	Value:

WATER QUALITY METER

Model:

Equipment ID #:

	Parameter	Standard	Exp. Date	Lot #	Morning Calibration/Check	Evening Check (one point only)	Additional Calib./Check (if necessary)
					Time:	Time:	Time:
					Initials:	Initials:	Initials:
First Point Calibration (Auto)	pH	4.00			Value:	Value:	Value:
	Conductivity (mS/cm)	4.49			Value:	Value:	Value:
	Turbidity (NTU)	0			Value:	Value:	Value:
	DO (mg/L)	8.9-9.1 (ambient air)	NA	NA	Value:	Value:	Value:
Second Point Calibration	pH	6.86			Value:	Value:	Value:
	Conductivity (mS/cm)	53.7			Value:	Value:	Value:
	Turbidity (NTU)	100			Value:	Value:	Value:
Third Point Calibration	pH	9.18			Value:	Value:	Value:
	Conductivity (mS/cm)	53.7			Value:	Value:	Value:
	Turbidity (NTU)	100			Value:	Value:	Value:

Additional Remarks:

00968390

EQUIPMENT CALIBRATION DAILY LOG

Date: 3/9/20

Project Number: NWO 1312.0150

Project Name: LHAAP - GWTP

Recorded By: Scott Beesinger

PID

Model: mini RAE 3000 Bulb: 10.6 eV

Equipment ID #: PGM 7320

	Parameter	Standard	Exp. Date	Lot #	Morning Calibration	Evening Check	Additional Calib./Check (if necessary)
					Time: 06:45	Time:	Time:
					Initials: SB	Initials:	Initials:
First Point Calibration	Vapor conc. (ppm)	0.0 (ambient air)	NA	NA	Value: To ZERO SB	Value:	Value:
Second Point Calibration	Vapor conc. (ppm)	100 ppm (isobutylene)	10/5/21	JBH-248-100-19	Value: SB	Value:	Value:

COMB. GAS/O_2 METER

Model:

Equipment ID #:

	Parameter	Standard	Exp. Date	Lot #	Morning Calibration	Evening Check	Additional Calib./Check (if necessary)
					Time:	Time:	Time:
					Initials:	Initials:	Initials:
First Point Calibration	O2 (%)				Value:	Value:	Value:
	% LEL Pentane				Value:	Value:	Value:

WATER QUALITY METER

Model:

Equipment ID #:

	Parameter	Standard	Exp. Date	Lot #	Morning Calibration/Check	Evening Check (one point only)	Additional Calib./Check (if necessary)
					Time:	Time:	Time:
					Initials:	Initials:	Initials:
First Point Calibration (Auto)	pH	4.00			Value:	Value:	Value:
	Conductivity (mS/cm)	4.49			Value:	Value:	Value:
	Turbidity (NTU)	0			Value:	Value:	Value:
	DO (mg/L)	8.9-9.1 (ambient air)	NA	NA	Value:	Value:	Value:
Second Point Calibration	pH	6.86			Value:	Value:	Value:
	Conductivity (mS/cm)	53.7			Value:	Value:	Value:
	Turbidity (NTU)	100			Value:	Value:	Value:
Third Point Calibration	pH	9.18			Value:	Value:	Value:
	Conductivity (mS/cm)	53.7			Value:	Value:	Value:
	Turbidity (NTU)	100			Value:	Value:	Value:

Additional Remarks:

00968391

EQUIPMENT CALIBRATION DAILY LOG

Date: 3/12/20

Project Number: NWO 1312.0150

Project Name: LHAAP - GWTP

Recorded By: Scott Beesinger

PID

Model: mini RAE 3000 Bulb: 10.6 eV

Equipment ID #: PGM 7320

	Parameter	Standard	Exp. Date	Lot #	Morning Calibration	Evening Check	Additional Calib./Check (if necessary)
					Time: 07:35	Time:	Time:
					Initials: SB	Initials:	Initials:
First Point Calibration	Vapor conc. (ppm)	0.0 (ambient air)	NA	NA	Value: TO ZERO SB	Value:	Value:
Second Point Calibration	Vapor conc. (ppm)	100 ppm (isobutylene)	10/5/21	JBH-248-100-19	Value: SB	Value:	Value:

COMB. GAS/O_2 METER

Model:

Equipment ID #:

	Parameter	Standard	Exp. Date	Lot #	Morning Calibration	Evening Check	Additional Calib./Check (if necessary)
					Time:	Time:	Time:
					Initials:	Initials:	Initials:
First Point Calibration	O2 (%)				Value:	Value:	Value:
	% LEL Pentane				Value:	Value:	Value:

WATER QUALITY METER

Model:

Equipment ID #:

	Parameter	Standard	Exp. Date	Lot #	Morning Calibration/Check	Evening Check (one point only)	Additional Calib./Check (if necessary)
					Time:	Time:	Time:
					Initials:	Initials:	Initials:
First Point Calibration (Auto)	pH	4.00			Value:	Value:	Value:
	Conductivity (mS/cm)	4.49			Value:	Value:	Value:
	Turbidity (NTU)	0			Value:	Value:	Value:
	DO (mg/L)	8.9-9.1 (ambient air)	NA	NA	Value:	Value:	Value:
Second Point Calibration	pH	6.86			Value:	Value:	Value:
	Conductivity (mS/cm)	53.7			Value:	Value:	Value:
	Turbidity (NTU)	100			Value:	Value:	Value:
Third Point Calibration	pH	9.18			Value:	Value:	Value:
	Conductivity (mS/cm)	53.7			Value:	Value:	Value:
	Turbidity (NTU)	100			Value:	Value:	Value:

Additional Remarks:

00968392

EQUIPMENT CALIBRATION DAILY LOG

Date: 3/16/20

Project Number: NWO 1312.0150

Project Name: LHAAP - GWTP

Recorded By: Scott Beesinger

PID

Model: mini RAE 3000 Bulb: 10.6 eV

Equipment ID #: PGM 7320

	Parameter	Standard	Exp. Date	Lot #	Morning Calibration	Evening Check	Additional Calib./Check (if necessary)
					Time: 06:25	Time:	Time:
					Initials: SB	Initials:	Initials:
First Point Calibration	Vapor conc. (ppm)	0.0 (ambient air)	NA	NA	Value: TO ZERO SB	Value:	Value:
Second Point Calibration	Vapor conc. (ppm)	100 ppm (isobutylene)	10/5/21	JBH-248-100-19	Value: SB	Value:	Value:

COMB. GAS/O_2 METER

Model:

Equipment ID #:

	Parameter	Standard	Exp. Date	Lot #	Morning Calibration	Evening Check	Additional Calib./Check (if necessary)
					Time:	Time:	Time:
					Initials:	Initials:	Initials:
First Point Calibration	O2 (%)				Value:	Value:	Value:
	% LEL Pentane				Value:	Value:	Value:

WATER QUALITY METER

Model:

Equipment ID #:

	Parameter	Standard	Exp. Date	Lot #	Morning Calibration/Check	Evening Check (one point only)	Additional Calib./Check (if necessary)
					Time:	Time:	Time:
					Initials:	Initials:	Initials:
First Point Calibration (Auto)	pH	4.00			Value:	Value:	Value:
	Conductivity (mS/cm)	4.49			Value:	Value:	Value:
	Turbidity (NTU)	0			Value:	Value:	Value:
	DO (mg/L)	8.9-9.1 (ambient air)	NA	NA	Value:	Value:	Value:
Second Point Calibration	pH	6.86			Value:	Value:	Value:
	Conductivity (mS/cm)	53.7			Value:	Value:	Value:
	Turbidity (NTU)	100			Value:	Value:	Value:
Third Point Calibration	pH	9.18			Value:	Value:	Value:
	Conductivity (mS/cm)	53.7			Value:	Value:	Value:
	Turbidity (NTU)	100			Value:	Value:	Value:

Additional Remarks:

00968393

EQUIPMENT CALIBRATION DAILY LOG

Date: 3/19/20

Project Number: NWO 1312.0150

Project Name: LHAAP - GWTP

Recorded By: Scott Beesinger

PID

Model: Mini Rae 3000 Bulb: 10.7 eV

Equipment ID #: PGM 7320

	Parameter	Standard	Exp. Date	Lot #	Morning Calibration	Evening Check	Additional Calib./Check (if necessary)
					Time: 07:40	Time:	Time:
					Initials: SB	Initials:	Initials:
First Point Calibration	Vapor conc. (ppm)	0.0 (ambient air)	NA	NA	Value: TO ZERO SB	Value:	Value:
Second Point Calibration	Vapor conc. (ppm)	100 ppm (isobutylene)	10/5/21	JBH-248-100-19	Value: SB	Value:	Value:

COMB. GAS/O_2 METER

Model:

Equipment ID #:

	Parameter	Standard	Exp. Date	Lot #	Morning Calibration	Evening Check	Additional Calib./Check (if necessary)
					Time:	Time:	Time:
					Initials:	Initials:	Initials:
First Point Calibration	O2 (%)				Value:	Value:	Value:
	% LEL Pentane				Value:	Value:	Value:

WATER QUALITY METER

Model:

Equipment ID #:

	Parameter	Standard	Exp. Date	Lot #	Morning Calibration/Check	Evening Check (one point only)	Additional Calib./Check (if necessary)
					Time:	Time:	Time:
					Initials:	Initials:	Initials:
First Point Calibration (4+1p)	pH	4.00			Value:	Value:	Value:
	Conductivity (mS/cm)	4.49			Value:	Value:	Value:
	Turbidity (NTU)	0			Value:	Value:	Value:
	DO (mg/L)	8.9-9.1 (ambient air)	NA	NA	Value:	Value:	Value:
Second Point Calibration	pH	6.86			Value:	Value:	Value:
	Conductivity (mS/cm)	53.7			Value:	Value:	Value:
	Turbidity (NTU)	100			Value:	Value:	Value:
Third Point Calibration	pH	9.18			Value:	Value:	Value:
	Conductivity (mS/cm)	53.7			Value:	Value:	Value:
	Turbidity (NTU)	100			Value:	Value:	Value:

Additional Remarks:

00968394

EQUIPMENT CALIBRATION DAILY LOG

Date: 3/23/20

Project Number: NWO 1312.0150

Project Name: LHAAP - GWTP

Recorded By: Scott Beesinger

					Morning Calibration	Evening Check	Additional Calib./Check (if necessary)
PID	Model: MiniRAE 3000		Bulb: 10.6 eV				
	Equipment ID #: PGM 7320						
	Parameter	Standard	Exp. Date	Lot #	Time: 06:40	Time:	Time:
					Initials: SB	Initials:	Initials:
First Point Calibration	Vapor conc. (ppm)	0.0 (ambient air)	NA	NA	Value: To ZERO SB	Value:	Value:
Second Point Calibration	Vapor conc. (ppm)	100 ppm (isobutylene)	10/5/21	JBH-248-100-19	Value: SB	Value:	Value:

					Morning Calibration	Evening Check	Additional Calib./Check (if necessary)
COMB. GAS/O_2 METER	Model:						
	Equipment ID #:						
	Parameter	Standard	Exp. Date	Lot #	Time:	Time:	Time:
					Initials:	Initials:	Initials:
First Point Calibration	O2 (%)				Value:	Value:	Value:
	% LEL Pentane				Value:	Value:	Value:

					Morning Calibration/Check	Evening Check (one point only)	Additional Calib./Check (if necessary)
WATER QUALITY METER	Model:						
	Equipment ID #:						
	Parameter	Standard	Exp. Date	Lot #	Time:	Time:	Time:
					Initials:	Initials:	Initials:
First Point Calibration (Auto)	pH	4.00			Value:	Value:	Value:
	Conductivity (mS/cm)	4.49			Value:	Value:	Value:
	Turbidity (NTU)	0			Value:	Value:	Value:
	DO (mg/L)	8.9-9.1 (ambient air)	NA	NA	Value:	Value:	Value:
Second Point Calibration	pH	6.86			Value:	Value:	Value:
	Conductivity (mS/cm)	53.7			Value:	Value:	Value:
	Turbidity (NTU)	100			Value:	Value:	Value:
Third Point Calibration	pH	9.18			Value:	Value:	Value:
	Conductivity (mS/cm)	53.7			Value:	Value:	Value:
	Turbidity (NTU)	100			Value:	Value:	Value:

Additional Remarks:

00968395

EQUIPMENT CALIBRATION DAILY LOG

Date: 3/26/20

Project Number: NWO 1312.0150

Project Name: LHAAP - GWTP

Recorded By: Scott Beesinger

PID

Model: MiniRae 3000 Bulb: 10.6 eV

Equipment ID #: PGM 7320

	Parameter	Standard	Exp. Date	Lot #	Morning Calibration	Evening Check	Additional Calib./Check (if necessary)
					Time: 07:30	Time:	Time:
					Initials: SB	Initials:	Initials:
First Point Calibration	Vapor conc. (ppm)	0.0 (ambient air)	NA	NA	Value: TO ZERO SB	Value:	Value:
Second Point Calibration	Vapor conc. (ppm)	100 ppm (isobutylene)	10/5/21	JBH-248-100-19	Value: SB	Value:	Value:

COMB. GAS/O_2 METER

Model:

Equipment ID #:

	Parameter	Standard	Exp. Date	Lot #	Morning Calibration	Evening Check	Additional Calib./Check (if necessary)
					Time:	Time:	Time:
					Initials:	Initials:	Initials:
First Point Calibration	O2 (%)				Value:	Value:	Value:
	% LEL Pentane				Value:	Value:	Value:

WATER QUALITY METER

Model:

Equipment ID #:

	Parameter	Standard	Exp. Date	Lot #	Morning Calibration/Check	Evening Check (one point only)	Additional Calib./Check (if necessary)
					Time:	Time:	Time:
					Initials:	Initials:	Initials:
First Point Calibration (Auto)	pH	4.00			Value:	Value:	Value:
	Conductivity (mS/cm)	4.49			Value:	Value:	Value:
	Turbidity (NTU)	0			Value:	Value:	Value:
	DO (mg/L)	8.9-9.1 (ambient air)	NA	NA	Value:	Value:	Value:
Second Point Calibration	pH	6.86			Value:	Value:	Value:
	Conductivity (mS/cm)	53.7			Value:	Value:	Value:
	Turbidity (NTU)	100			Value:	Value:	Value:
Third Point Calibration	pH	9.18			Value:	Value:	Value:
	Conductivity (mS/cm)	53.7			Value:	Value:	Value:
	Turbidity (NTU)	100			Value:	Value:	Value:

Additional Remarks:

00968396

EQUIPMENT CALIBRATION DAILY LOG

Date: 3/30/20

Project Number: NWO 1312.0150

Project Name: LHAAP - GWTP

Recorded By: Scott Beesinger

PID

Model: mini RAE 3000 Bulb: 10.6 eV

Equipment ID #: PGM 7320

	Parameter	Standard	Exp. Date	Lot #	Morning Calibration	Evening Check	Additional Calib./Check (if necessary)
					Time: 06:25	Time:	Time:
					Initials: SB	Initials:	Initials:
First Point Calibration	Vapor conc. (ppm)	0.0 (ambient air)	NA	NA	Value: To ZERO SB	Value:	Value:
Second Point Calibration	Vapor conc. (ppm)	100 ppm (isobutylene)	10/5/21	JBH-248-100-19	Value: SB	Value:	Value:

COMB. GAS/O_2 METER

Model:

Equipment ID #:

	Parameter	Standard	Exp. Date	Lot #	Morning Calibration	Evening Check	Additional Calib./Check (if necessary)
					Time:	Time:	Time:
					Initials:	Initials:	Initials:
First Point Calibration	O2 (%)				Value:	Value:	Value:
	% LEL Pentane				Value:	Value:	Value:

WATER QUALITY METER

Model:

Equipment ID #:

	Parameter	Standard	Exp. Date	Lot #	Morning Calibration/Check	Evening Check (one point only)	Additional Calib./Check (if necessary)
					Time:	Time:	Time:
					Initials:	Initials:	Initials:
First Point Calibration (Auto)	pH	4.00			Value:	Value:	Value:
	Conductivity (mS/cm)	4.49			Value:	Value:	Value:
	Turbidity (NTU)	0			Value:	Value:	Value:
	DO (mg/L)	8.9-9.1 (ambient air)	NA	NA	Value:	Value:	Value:
Second Point Calibration	pH	6.86			Value:	Value:	Value:
	Conductivity (mS/cm)	53.7			Value:	Value:	Value:
	Turbidity (NTU)	100			Value:	Value:	Value:
Third Point Calibration	pH	9.18			Value:	Value:	Value:
	Conductivity (mS/cm)	53.7			Value:	Value:	Value:
	Turbidity (NTU)	100			Value:	Value:	Value:

Additional Remarks:

ATTACHMENT 3: AIR ANALYTICAL LABORATORY REPORT

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

LABORATORY REPORT

March 23, 2020

Marcia Olive
Bhate Environmental Associates, Inc.
445 Union Blvd Suite 129
Lakewood, CO 80228

RE: LHAAP GWTP / NW01312.0150

Dear Marcia:

Enclosed are the results of the samples submitted to our laboratory on March 2, 2020. For your reference, these analyses have been assigned our service request number P2001177.

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 Sue Anderson at 3:10 pm, Mar 23, 2020

Sue Anderson
Project Manager

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

Client: Bhate Environmental Associates, Inc. Service Request No: P2001177
Project: LHAAP GWTP / NW01312.0150

CASE NARRATIVE

The samples were received intact under chain of custody on March 2, 2020 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.

Volatile Organic Compound Analysis

The samples were analyzed for volatile organic compounds in accordance with EPA Method TO-15 from the Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air, Second Edition (EPA/625/R-96/010b), January, 1999. This procedure is described in laboratory SOP VOA-TO15. The analytical system was comprised of a gas chromatograph / mass spectrometer (GC/MS) interfaced to a whole-air preconcentrator. 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 NELAP or DoD-ELAP accreditation.

The spike recovery of vinyl acetate for the Laboratory Control Sample (DLCS) analyzed was outside the laboratory generated control criterion. The recovery error equates to a potential high bias. However, the spike recovery of the analyte in question was within the method criteria; therefore, the data quality has not been significantly affected. No corrective action was taken.

The containers were cleaned, prior to sampling, down to the method reporting limit (MRL) reported for this project. For projects requiring DoD QSM 5.1 compliance canisters were cleaned to <1/2 the MRL. Please note, projects which require reporting below the MRL could have results between the MRL and method detection limit (MDL) that are biased high.

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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www.alsglobal.com

ALS Environmental – Simi Valley

CERTIFICATIONS, ACCREDITATIONS, AND REGISTRATIONS

Agency	Web Site	Number
Alaska DEC	http://dec.alaska.gov/eh/lab.aspx	17-019
Arizona DHS	http://www.azdhs.gov/preparedness/state-laboratory/lab-licensure-certification/index.php#laboratory-licensure-home	AZ0694
Florida DOH (NELAP)	http://www.floridahealth.gov/licensing-and-regulation/environmental-laboratories/index.html	E871020
Louisiana DEQ (NELAP)	http://www.deq.louisiana.gov/page/la-lab-accreditation	05071
Maine DHHS	http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/professionals/labCert.shtml	2018027
Minnesota DOH (NELAP)	http://www.health.state.mn.us/accreditation	1776326
New Jersey DEP (NELAP)	http://www.nj.gov/dep/enforcement/oqa.html	CA009
New York DOH (NELAP)	http://www.wadsworth.org/labcert/elap/elap.html	11221
Oregon PHD (NELAP)	http://www.oregon.gov/oha/ph/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	4068-007
Pennsylvania DEP	http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx	68-03307 (Registration)
PJLA (DoD ELAP)	http://www.pjlabs.com/search-accredited-labs	65818 (Testing)
Texas CEQ (NELAP)	http://www.tceq.texas.gov/agency/qa/env_lab_accreditation.html	T104704413-19-10
Utah DOH (NELAP)	http://health.utah.gov/lab/lab_cert_env	CA016272019-10
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C946

Analyses were performed according to our laboratory's NELAP and DoD-ELAP approved quality assurance program. A complete listing of specific NELAP and DoD-ELAP certified analytes can be found in the certifications section at www.alsglobal.com, or at the accreditation body's website.

Each of the certifications listed above have an explicit Scope of Accreditation that applies to specific matrices/methods/analytes; therefore, please contact the laboratory for information corresponding to a particular certification.

ALS ENVIRONMENTAL

DETAIL SUMMARY REPORT

Client: Bhate Environmental Associates, Inc. Service Request: P2001177

Project ID: LHAAP GWTP / NW01312.0150

Date Received: 3/2/2020

Time Received: 11:30

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	Container ID	Pi1 (psig)	Pf1 (psig)	TO-15 - VOC Cans
LH18/24-Air_022420_Stripper	P2001177-001	Air	2/24/2020	14:00	AC00768	-0.06	3.95	X
LH18/24-Air_022420_Stripper_a	P2001177-002	Air	2/24/2020	14:00	AS01339	-1.82	4.06	X
LH18/24-Air_022420_GWTP	P2001177-003	Air	2/24/2020	14:15	AS01437	-1.67	3.75	X
LH18/24-Air_022420_Downwind	P2001177-004	Air	2/25/2020	07:00	AS00322	1.30	3.96	X

Air - Chain of Custody Record & Analytical Service Request

Page 1 of 1

2655 Park Center Drive, Suite A
Simi Valley, California 93065
Phone (805) 526-7161

Requested Turnaround Time in Business Days (Surcharges) please circle
1 Day (100%) 2 Day (75%) 3 Day (50%) 4 Day (35%) 5 Day (25%) 10 Day-Standard

ALS Project No. R1001177

ALS Contact:

Company Name & Address (Reporting Information)	Project Name	Project Number	P.O. # / Billing Information
BHATE ENVIRONMENTAL 445 UNION BLVD., Suite 129 LAKEWOOD, CO. 80228	LHAAP-GWTP	NW01312.0150	

Project Manager	Phone	Fax
Kim NEMMERS	205-918-4000	

Email Address for Result Reporting	Sampler (Print & Sign)
molive@bhate.com	Scott Beesinger Scott Beesinger

Analysis Method

TO-15

Client Sample ID	Laboratory ID Number	Date Collected	Time Collected	Canister ID (Bar code # - AC, SC, etc.)	Flow Controller ID (Bar code # - FC #)	Canister Start Pressure "Hg	Canister End Pressure "Hg/psig	Sample Volume			Comments e.g. Actual Preservative or specific instructions
LH18Z4-AIR_022420_STRipper		2/24/20	1400	AC00768		-30	-3.0	6L	✓		
LH18Z4-AIR_022420_STRipper_a		2/24/20	1400	AS01339		-29	0	6L	✓		
LH18Z4-AIR_022420_GWTP		2/24/20	1415	AS01437	FCR00495	-29	-4	6L	✓		
LH18Z4-AIR_022420_Downwind		2/25/20	0700	AS00322	FCR00496	-30	0	6L	✓		

Report Tier Levels - please select

Tier I - Results (Default if not specified) _____ Tier III (Results + QC & Calibration Summaries) _____
Tier II (Results + QC Summaries) _____ Tier IV (Data Validation Package) 10% Surcharge _____

EDD required Yes / No
Type: _____ Units: _____

Chain of Custody Seal: (Circle) INTACT BROKEN ABSENT

Project Requirements (MRLs, QAPP)

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:
Scott Beesinger	2/25/20	0715		3/2/20	1130
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:

Cooler / Blank Temperature ____°C

5 of 132

00968402

ALS Environmental
Sample Acceptance Check Form

Client: Bhate Environmental Associates, Inc. Work order: P2001177

Project: LHAAP GWTP / NW01312.0150

Sample(s) received on: 03/02/20 Date opened: 03/02/20 by: DENISE.POSADA

Note: This form is used for all samples received by ALS. The use of this form for custody seals is strictly meant to indicate presence/absence and not as an indication of compliance or nonconformity. Thermal preservation and pH will only be evaluated either at the request of the client and/or as required by the method/SOP.

		Yes	No	N/A
1	Were **sample containers** properly marked with client sample ID?	☒	☐	☐
2	Did **sample containers** arrive in good condition?	☒	☐	☐
3	Were **chain-of-custody** papers used and filled out?	☒	☐	☐
4	Did **sample container labels** and/or tags agree with custody papers?	☒	☐	☐
5	Was **sample volume** received adequate for analysis?	☒	☐	☐
6	Are samples within specified holding times?	☒	☐	☐
7	Was proper **temperature** (thermal preservation) of cooler at receipt adhered to?	☐	☐	☒
8	Were **custody seals** on outside of cooler/Box/Container?	☐	☒	☐
	Location of seal(s)? _____ Sealing Lid?	☐	☐	☒
	Were signature and date included?	☐	☐	☒
	Were seals intact?	☐	☐	☒
9	Do containers have appropriate **preservation**, according to method/SOP or Client specified information?	☐	☐	☒
	Is there a client indication that the submitted samples are **pH** preserved?	☐	☐	☒
	Were **VOA vials** checked for presence/absence of air bubbles?	☐	☐	☒
	Does the client/method/SOP require that the analyst check the sample pH and if necessary alter it?	☐	☐	☒
10	**Tubes:** Are the tubes capped and intact?	☐	☐	☒
11	**Badges:** Are the badges properly capped and intact?	☐	☐	☒
	Are dual bed badges separated and individually capped and intact?	☐	☐	☒

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P2001177-001.01	6.0 L Ambient Can					
P2001177-002.01	6.0 L Silonite Can					
P2001177-003.01	6.0 L Silonite Can					
P2001177-004.01	6.0 L Silonite Can					

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

RSK - MEEPP, HCL (pH<2); RSK - CO2, (pH 5-8); Sulfur (pH>4)

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **Bhate Environmental Associates, Inc.**
Client Sample ID: **LH18/24-Air_022420_Stripper** ALS Project ID: P2001177
Client Project ID: **LHAAP GWTP / NW01312.0150** ALS Sample ID: P2001177-001

Test Code: EPA TO-15 Date Collected: 2/24/20
Instrument ID: Tekmar AUTOCAN/Agilent 5975Binert/6890N/MS13 Date Received: 3/2/20
Analyst: Wida Ang Date Analyzed: 3/12/20
Sample Type: 6.0 L Summa Canister Volume(s) Analyzed: 0.015 Liter(s)
Test Notes: 0.0030 Liter(s)
Container ID: AC00768

Initial Pressure (psig): -0.06 Final Pressure (psig): 3.95

Canister Dilution Factor: 1.27

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
115-07-1	Propene	ND	45	ND	26	
75-71-8	Dichlorodifluoromethane (CFC 12)	ND	45	ND	9.1	
74-87-3	Chloromethane	ND	45	ND	22	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	45	ND	6.4	
75-01-4	Vinyl Chloride	**280**	46	**110**	18	
106-99-0	1,3-Butadiene	ND	45	ND	20	
74-83-9	Bromomethane	ND	46	ND	12	
75-00-3	Chloroethane	ND	46	ND	17	
64-17-5	Ethanol	ND	440	ND	230	
75-05-8	Acetonitrile	ND	45	ND	27	
107-02-8	Acrolein	ND	85	ND	37	
67-64-1	Acetone	ND	450	ND	190	
75-69-4	Trichlorofluoromethane (CFC 11)	ND	45	ND	8.0	
67-63-0	2-Propanol (Isopropyl Alcohol)	ND	180	ND	72	
107-13-1	Acrylonitrile	ND	45	ND	21	
75-35-4	1,1-Dichloroethene	**190**	46	**49**	12	
75-09-2	Methylene Chloride	**7,700**	45	**2,200**	13	
107-05-1	3-Chloro-1-propene (Allyl Chloride)	ND	46	ND	15	
76-13-1	Trichlorotrifluoroethane (CFC 113)	**19,000**	230	**2,500**	30	**D**
75-15-0	Carbon Disulfide	ND	93	ND	30	
156-60-5	trans-1,2-Dichloroethene	ND	46	ND	12	
75-34-3	1,1-Dichloroethane	ND	47	ND	12	
1634-04-4	Methyl tert-Butyl Ether	ND	46	ND	13	
108-05-4	Vinyl Acetate	ND	460	ND	130	**L**
78-93-3	2-Butanone (MEK)	ND	93	ND	32	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.
L = Laboratory control sample recovery outside the specified limits, results may be biased high.
D = The reported result is from a dilution.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **Bhate Environmental Associates, Inc.**
Client Sample ID: **LH18/24-Air_022420_Stripper** ALS Project ID: P2001177
Client Project ID: **LHAAP GWTP / NW01312.0150** ALS Sample ID: P2001177-001

Test Code: EPA TO-15 Date Collected: 2/24/20
Instrument ID: Tekmar AUTOCAN/Agilent 5975Binert/6890N/MS13 Date Received: 3/2/20
Analyst: Wida Ang Date Analyzed: 3/12/20
Sample Type: 6.0 L Summa Canister Volume(s) Analyzed: 0.015 Liter(s)
Test Notes: 0.0030 Liter(s)
Container ID: AC00768

Initial Pressure (psig): -0.06 Final Pressure (psig): 3.95

Canister Dilution Factor: 1.27

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	**8,800**	45	**2,200**	11	
141-78-6	Ethyl Acetate	ND	93	ND	26	
110-54-3	n-Hexane	ND	46	ND	13	
67-66-3	Chloroform	ND	46	ND	9.4	
109-99-9	Tetrahydrofuran (THF)	ND	47	ND	16	
107-06-2	1,2-Dichloroethane	**130**	46	**32**	11	
71-55-6	1,1,1-Trichloroethane	ND	46	ND	8.4	
71-43-2	Benzene	ND	45	ND	14	
56-23-5	Carbon Tetrachloride	ND	45	ND	7.1	
110-82-7	Cyclohexane	ND	93	ND	27	
78-87-5	1,2-Dichloropropane	ND	46	ND	9.9	
75-27-4	Bromodichloromethane	ND	46	ND	6.8	
79-01-6	Trichloroethene	**22,000**	230	**4,200**	43	**D**
123-91-1	1,4-Dioxane	ND	46	ND	13	
80-62-6	Methyl Methacrylate	ND	93	ND	23	
142-82-5	n-Heptane	ND	46	ND	11	
10061-01-5	cis-1,3-Dichloropropene	ND	44	ND	9.7	
108-10-1	4-Methyl-2-pentanone	ND	45	ND	11	
10061-02-6	trans-1,3-Dichloropropene	ND	45	ND	9.9	
79-00-5	1,1,2-Trichloroethane	ND	46	ND	8.4	
108-88-3	Toluene	ND	46	ND	12	
591-78-6	2-Hexanone	ND	46	ND	11	
124-48-1	Dibromochloromethane	ND	46	ND	5.4	
106-93-4	1,2-Dibromoethane	ND	46	ND	6.0	
123-86-4	n-Butyl Acetate	ND	47	ND	9.8	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.
D = The reported result is from a dilution.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **Bhate Environmental Associates, Inc.**
Client Sample ID: **LH18/24-Air_022420_Stripper** ALS Project ID: P2001177
Client Project ID: **LHAAP GWTP / NW01312.0150** ALS Sample ID: P2001177-001

Test Code: EPA TO-15 Date Collected: 2/24/20
Instrument ID: Tekmar AUTOCAN/Agilent 5975Binert/6890N/MS13 Date Received: 3/2/20
Analyst: Wida Ang Date Analyzed: 3/12/20
Sample Type: 6.0 L Summa Canister Volume(s) Analyzed: 0.015 Liter(s)
Test Notes: 0.0030 Liter(s)
Container ID: AC00768

Initial Pressure (psig): -0.06 Final Pressure (psig): 3.95

Canister Dilution Factor: 1.27

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
111-65-9	n-Octane	ND	46	ND	9.8	
127-18-4	Tetrachloroethene	**140**	44	**21**	6.5	
108-90-7	Chlorobenzene	ND	46	ND	9.9	
100-41-4	Ethylbenzene	ND	46	ND	11	
179601-23-1	m,p-Xylenes	ND	93	ND	21	
75-25-2	Bromoform	ND	46	ND	4.4	
100-42-5	Styrene	ND	45	ND	11	
95-47-6	o-Xylene	ND	46	ND	11	
111-84-2	n-Nonane	ND	46	ND	8.7	
79-34-5	1,1,2,2-Tetrachloroethane	ND	46	ND	6.7	
98-82-8	Cumene	ND	46	ND	9.3	
80-56-8	alpha-Pinene	ND	46	ND	8.2	
103-65-1	n-Propylbenzene	ND	46	ND	9.3	
622-96-8	4-Ethyltoluene	ND	46	ND	9.3	
108-67-8	1,3,5-Trimethylbenzene	ND	45	ND	9.1	
95-63-6	1,2,4-Trimethylbenzene	ND	46	ND	9.3	
100-44-7	Benzyl Chloride	ND	93	ND	18	
541-73-1	1,3-Dichlorobenzene	ND	46	ND	7.6	
106-46-7	1,4-Dichlorobenzene	ND	46	ND	7.6	
95-50-1	1,2-Dichlorobenzene	ND	46	ND	7.6	
5989-27-5	d-Limonene	ND	46	ND	8.2	
96-12-8	1,2-Dibromo-3-chloropropane	ND	45	ND	4.6	
120-82-1	1,2,4-Trichlorobenzene	ND	46	ND	6.2	
91-20-3	Naphthalene	ND	44	ND	8.4	
87-68-3	Hexachlorobutadiene	ND	45	ND	4.2	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **Bhate Environmental Associates, Inc.**
Client Sample ID: **LH18/24-Air_022420_Stripper_a** ALS Project ID: P2001177
Client Project ID: **LHAAP GWTP / NW01312.0150** ALS Sample ID: P2001177-002

Test Code: EPA TO-15 Date Collected: 2/24/20
Instrument ID: Tekmar AUTOCAN/Agilent 5975Binert/6890N/MS13 Date Received: 3/2/20
Analyst: Wida Ang Date Analyzed: 3/12/20
Sample Type: 6.0 L Silonite Canister Volume(s) Analyzed: 0.020 Liter(s)
Test Notes: 0.0040 Liter(s)
Container ID: AS01339

Initial Pressure (psig): -1.82 Final Pressure (psig): 4.06

Canister Dilution Factor: 1.46

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
115-07-1	Propene	ND	39	ND	22	
75-71-8	Dichlorodifluoromethane (CFC 12)	ND	39	ND	7.8	
74-87-3	Chloromethane	ND	39	ND	19	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	39	ND	5.5	
75-01-4	Vinyl Chloride	**340**	39	**130**	15	
106-99-0	1,3-Butadiene	ND	39	ND	17	
74-83-9	Bromomethane	ND	39	ND	10	
75-00-3	Chloroethane	ND	39	ND	15	
64-17-5	Ethanol	ND	380	ND	200	
75-05-8	Acetonitrile	ND	39	ND	23	
107-02-8	Acrolein	ND	73	ND	32	
67-64-1	Acetone	**540**	390	**230**	160	
75-69-4	Trichlorofluoromethane (CFC 11)	ND	39	ND	6.9	
67-63-0	2-Propanol (Isopropyl Alcohol)	ND	150	ND	62	
107-13-1	Acrylonitrile	ND	39	ND	18	
75-35-4	1,1-Dichloroethene	**240**	39	**60**	9.9	
75-09-2	Methylene Chloride	**9,900**	190	**2,800**	56	**D**
107-05-1	3-Chloro-1-propene (Allyl Chloride)	ND	39	ND	13	
76-13-1	Trichlorotrifluoroethane (CFC 113)	**19,000**	200	**2,500**	26	**D**
75-15-0	Carbon Disulfide	ND	80	ND	26	
156-60-5	trans-1,2-Dichloroethene	**41**	39	**10**	9.9	
75-34-3	1,1-Dichloroethane	ND	40	ND	9.9	
1634-04-4	Methyl tert-Butyl Ether	ND	39	ND	11	
108-05-4	Vinyl Acetate	ND	390	ND	110	**L**
78-93-3	2-Butanone (MEK)	ND	80	ND	27	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.
L = Laboratory control sample recovery outside the specified limits, results may be biased high.

D = The reported result is from a dilution.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **Bhate Environmental Associates, Inc.**
Client Sample ID: **LH18/24-Air_022420_Stripper_a** ALS Project ID: P2001177
Client Project ID: **LHAAP GWTP / NW01312.0150** ALS Sample ID: P2001177-002

Test Code: EPA TO-15 Date Collected: 2/24/20
Instrument ID: Tekmar AUTOCAN/Agilent 5975Binert/6890N/MS13 Date Received: 3/2/20
Analyst: Wida Ang Date Analyzed: 3/12/20
Sample Type: 6.0 L Silonite Canister Volume(s) Analyzed: 0.020 Liter(s)
Test Notes: 0.0040 Liter(s)
Container ID: AS01339

Initial Pressure (psig): -1.82 Final Pressure (psig): 4.06

Canister Dilution Factor: 1.46

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	**11,000**	190	**2,900**	49	**D**
141-78-6	Ethyl Acetate	ND	80	ND	22	
110-54-3	n-Hexane	ND	39	ND	11	
67-66-3	Chloroform	**47**	39	**9.6**	8.1	
109-99-9	Tetrahydrofuran (THF)	ND	40	ND	14	
107-06-2	1,2-Dichloroethane	**160**	39	**39**	9.7	
71-55-6	1,1,1-Trichloroethane	ND	39	ND	7.2	
71-43-2	Benzene	ND	39	ND	12	
56-23-5	Carbon Tetrachloride	ND	39	ND	6.2	
110-82-7	Cyclohexane	ND	80	ND	23	
78-87-5	1,2-Dichloropropane	ND	39	ND	8.5	
75-27-4	Bromodichloromethane	ND	39	ND	5.9	
79-01-6	Trichloroethene	**22,000**	200	**4,200**	37	**D**
123-91-1	1,4-Dioxane	ND	39	ND	11	
80-62-6	Methyl Methacrylate	ND	80	ND	20	
142-82-5	n-Heptane	ND	39	ND	9.6	
10061-01-5	cis-1,3-Dichloropropene	ND	38	ND	8.4	
108-10-1	4-Methyl-2-pentanone	ND	39	ND	9.4	
10061-02-6	trans-1,3-Dichloropropene	ND	39	ND	8.5	
79-00-5	1,1,2-Trichloroethane	ND	39	ND	7.2	
108-88-3	Toluene	ND	39	ND	10	
591-78-6	2-Hexanone	ND	39	ND	9.6	
124-48-1	Dibromochloromethane	ND	39	ND	4.6	
106-93-4	1,2-Dibromoethane	ND	39	ND	5.1	
123-86-4	n-Butyl Acetate	ND	40	ND	8.5	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

D = The reported result is from a dilution.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **Bhate Environmental Associates, Inc.**
Client Sample ID: **LH18/24-Air_022420_Stripper_a** ALS Project ID: P2001177
Client Project ID: **LHAAP GWTP / NW01312.0150** ALS Sample ID: P2001177-002

Test Code: EPA TO-15 Date Collected: 2/24/20
Instrument ID: Tekmar AUTOCAN/Agilent 5975Binert/6890N/MS13 Date Received: 3/2/20
Analyst: Wida Ang Date Analyzed: 3/12/20
Sample Type: 6.0 L Silonite Canister Volume(s) Analyzed: 0.020 Liter(s)
Test Notes: 0.0040 Liter(s)
Container ID: AS01339

Initial Pressure (psig): -1.82 Final Pressure (psig): 4.06

Canister Dilution Factor: 1.46

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
111-65-9	n-Octane	ND	39	ND	8.4	
127-18-4	Tetrachloroethene	**170**	38	**25**	5.6	
108-90-7	Chlorobenzene	ND	39	ND	8.6	
100-41-4	Ethylbenzene	ND	39	ND	9.1	
179601-23-1	m,p-Xylenes	ND	80	ND	18	
75-25-2	Bromoform	ND	39	ND	3.8	
100-42-5	Styrene	ND	39	ND	9.1	
95-47-6	o-Xylene	ND	39	ND	9.1	
111-84-2	n-Nonane	ND	39	ND	7.5	
79-34-5	1,1,2,2-Tetrachloroethane	ND	39	ND	5.7	
98-82-8	Cumene	ND	39	ND	8.0	
80-56-8	alpha-Pinene	ND	39	ND	7.1	
103-65-1	n-Propylbenzene	ND	39	ND	8.0	
622-96-8	4-Ethyltoluene	ND	39	ND	8.0	
108-67-8	1,3,5-Trimethylbenzene	ND	39	ND	7.9	
95-63-6	1,2,4-Trimethylbenzene	ND	39	ND	8.0	
100-44-7	Benzyl Chloride	ND	80	ND	16	
541-73-1	1,3-Dichlorobenzene	ND	39	ND	6.6	
106-46-7	1,4-Dichlorobenzene	ND	39	ND	6.6	
95-50-1	1,2-Dichlorobenzene	ND	39	ND	6.6	
5989-27-5	d-Limonene	ND	39	ND	7.1	
96-12-8	1,2-Dibromo-3-chloropropane	ND	39	ND	4.0	
120-82-1	1,2,4-Trichlorobenzene	ND	39	ND	5.3	
91-20-3	Naphthalene	ND	38	ND	7.2	
87-68-3	Hexachlorobutadiene	ND	39	ND	3.6	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **Bhate Environmental Associates, Inc.**
Client Sample ID: **LH18/24-Air_022420_GWTP** ALS Project ID: P2001177
Client Project ID: **LHAAP GWTP / NW01312.0150** ALS Sample ID: P2001177-003

Test Code: EPA TO-15 Date Collected: 2/24/20
Instrument ID: Tekmar AUTOCAN/Agilent 5975Binert/6890N/MS13 Date Received: 3/2/20
Analyst: Wida Ang Date Analyzed: 3/12/20
Sample Type: 6.0 L Silonite Canister Volume(s) Analyzed: 1.00 Liter(s)
Test Notes:
Container ID: AS01437

Initial Pressure (psig): -1.67 Final Pressure (psig): 3.75

Canister Dilution Factor: 1.42

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
115-07-1	Propene	ND	0.75	ND	0.44	
75-71-8	Dichlorodifluoromethane (CFC 12)	**2.5**	0.75	**0.51**	0.15	
74-87-3	Chloromethane	ND	0.75	ND	0.36	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	0.75	ND	0.11	
75-01-4	Vinyl Chloride	ND	0.77	ND	0.30	
106-99-0	1,3-Butadiene	ND	0.75	ND	0.34	
74-83-9	Bromomethane	ND	0.77	ND	0.20	
75-00-3	Chloroethane	ND	0.77	ND	0.29	
64-17-5	Ethanol	ND	7.4	ND	3.9	
75-05-8	Acetonitrile	ND	0.75	ND	0.45	
107-02-8	Acrolein	ND	1.4	ND	0.62	
67-64-1	Acetone	ND	7.5	ND	3.2	
75-69-4	Trichlorofluoromethane (CFC 11)	**1.3**	0.75	**0.24**	0.13	
67-63-0	2-Propanol (Isopropyl Alcohol)	ND	3.0	ND	1.2	
107-13-1	Acrylonitrile	ND	0.75	ND	0.35	
75-35-4	1,1-Dichloroethene	ND	0.77	ND	0.19	
75-09-2	Methylene Chloride	**2.3**	0.75	**0.66**	0.22	
107-05-1	3-Chloro-1-propene (Allyl Chloride)	ND	0.77	ND	0.25	
76-13-1	Trichlorotrifluoroethane (CFC 113)	**5.0**	0.77	**0.66**	0.10	
75-15-0	Carbon Disulfide	ND	1.6	ND	0.50	
156-60-5	trans-1,2-Dichloroethene	ND	0.77	ND	0.19	
75-34-3	1,1-Dichloroethane	ND	0.78	ND	0.19	
1634-04-4	Methyl tert-Butyl Ether	ND	0.77	ND	0.21	
108-05-4	Vinyl Acetate	ND	7.7	ND	2.2	**L**
78-93-3	2-Butanone (MEK)	ND	1.6	ND	0.53	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.
L = Laboratory control sample recovery outside the specified limits, results may be biased high.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **Bhate Environmental Associates, Inc.**
Client Sample ID: **LH18/24-Air_022420_GWTP** ALS Project ID: P2001177
Client Project ID: **LHAAP GWTP / NW01312.0150** ALS Sample ID: P2001177-003

Test Code: EPA TO-15 Date Collected: 2/24/20
Instrument ID: Tekmar AUTOCAN/Agilent 5975Binert/6890N/MS13 Date Received: 3/2/20
Analyst: Wida Ang Date Analyzed: 3/12/20
Sample Type: 6.0 L Silonite Canister Volume(s) Analyzed: 1.00 Liter(s)
Test Notes:
Container ID: AS01437

Initial Pressure (psig): -1.67 Final Pressure (psig): 3.75

Canister Dilution Factor: 1.42

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	**2.2**	0.75	**0.57**	0.19	
141-78-6	Ethyl Acetate	**3.9**	1.6	**1.1**	0.43	
110-54-3	n-Hexane	**0.82**	0.77	**0.23**	0.22	
67-66-3	Chloroform	ND	0.77	ND	0.16	
109-99-9	Tetrahydrofuran (THF)	ND	0.78	ND	0.26	
107-06-2	1,2-Dichloroethane	ND	0.77	ND	0.19	
71-55-6	1,1,1-Trichloroethane	ND	0.77	ND	0.14	
71-43-2	Benzene	ND	0.75	ND	0.24	
56-23-5	Carbon Tetrachloride	ND	0.75	ND	0.12	
110-82-7	Cyclohexane	ND	1.6	ND	0.45	
78-87-5	1,2-Dichloropropane	ND	0.77	ND	0.17	
75-27-4	Bromodichloromethane	ND	0.77	ND	0.11	
79-01-6	Trichloroethene	**4.5**	0.77	**0.83**	0.14	
123-91-1	1,4-Dioxane	ND	0.77	ND	0.21	
80-62-6	Methyl Methacrylate	ND	1.6	ND	0.38	
142-82-5	n-Heptane	ND	0.77	ND	0.19	
10061-01-5	cis-1,3-Dichloropropene	ND	0.74	ND	0.16	
108-10-1	4-Methyl-2-pentanone	ND	0.75	ND	0.18	
10061-02-6	trans-1,3-Dichloropropene	ND	0.75	ND	0.17	
79-00-5	1,1,2-Trichloroethane	ND	0.77	ND	0.14	
108-88-3	Toluene	ND	0.77	ND	0.20	
591-78-6	2-Hexanone	ND	0.77	ND	0.19	
124-48-1	Dibromochloromethane	ND	0.77	ND	0.090	
106-93-4	1,2-Dibromoethane	ND	0.77	ND	0.10	
123-86-4	n-Butyl Acetate	ND	0.78	ND	0.16	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **Bhate Environmental Associates, Inc.**
Client Sample ID: **LH18/24-Air_022420_GWTP** ALS Project ID: P2001177
Client Project ID: **LHAAP GWTP / NW01312.0150** ALS Sample ID: P2001177-003

Test Code: EPA TO-15 Date Collected: 2/24/20
Instrument ID: Tekmar AUTOCAN/Agilent 5975Binert/6890N/MS13 Date Received: 3/2/20
Analyst: Wida Ang Date Analyzed: 3/12/20
Sample Type: 6.0 L Silonite Canister Volume(s) Analyzed: 1.00 Liter(s)
Test Notes:
Container ID: AS01437

Initial Pressure (psig): -1.67 Final Pressure (psig): 3.75

Canister Dilution Factor: 1.42

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
111-65-9	n-Octane	ND	0.77	ND	0.16	
127-18-4	Tetrachloroethene	ND	0.74	ND	0.11	
108-90-7	Chlorobenzene	ND	0.77	ND	0.17	
100-41-4	Ethylbenzene	ND	0.77	ND	0.18	
179601-23-1	m,p-Xylenes	ND	1.6	ND	0.36	
75-25-2	Bromoform	ND	0.77	ND	0.074	
100-42-5	Styrene	ND	0.75	ND	0.18	
95-47-6	o-Xylene	ND	0.77	ND	0.18	
111-84-2	n-Nonane	ND	0.77	ND	0.15	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.77	ND	0.11	
98-82-8	Cumene	ND	0.77	ND	0.16	
80-56-8	alpha-Pinene	ND	0.77	ND	0.14	
103-65-1	n-Propylbenzene	ND	0.77	ND	0.16	
622-96-8	4-Ethyltoluene	ND	0.77	ND	0.16	
108-67-8	1,3,5-Trimethylbenzene	ND	0.75	ND	0.15	
95-63-6	1,2,4-Trimethylbenzene	ND	0.77	ND	0.16	
100-44-7	Benzyl Chloride	ND	1.6	ND	0.30	
541-73-1	1,3-Dichlorobenzene	ND	0.77	ND	0.13	
106-46-7	1,4-Dichlorobenzene	ND	0.77	ND	0.13	
95-50-1	1,2-Dichlorobenzene	ND	0.77	ND	0.13	
5989-27-5	d-Limonene	ND	0.77	ND	0.14	
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.75	ND	0.078	
120-82-1	1,2,4-Trichlorobenzene	ND	0.77	ND	0.10	
91-20-3	Naphthalene	ND	0.74	ND	0.14	
87-68-3	Hexachlorobutadiene	ND	0.75	ND	0.071	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **Bhate Environmental Associates, Inc.**
Client Sample ID: **LH18/24-Air_022420_Downwind** ALS Project ID: P2001177
Client Project ID: **LHAAP GWTP / NW01312.0150** ALS Sample ID: P2001177-004

Test Code: EPA TO-15 Date Collected: 2/25/20
Instrument ID: Tekmar AUTOCAN/Agilent 5975Binert/6890N/MS13 Date Received: 3/2/20
Analyst: Wida Ang Date Analyzed: 3/12/20
Sample Type: 6.0 L Silonite Canister Volume(s) Analyzed: 1.00 Liter(s)
Test Notes:
Container ID: AS00322

Initial Pressure (psig): 1.30 Final Pressure (psig): 3.96

Canister Dilution Factor: 1.17

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
115-07-1	Propene	ND	0.62	ND	0.36	
75-71-8	Dichlorodifluoromethane (CFC 12)	**2.1**	0.62	**0.42**	0.13	
74-87-3	Chloromethane	ND	0.62	ND	0.30	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	0.62	ND	0.089	
75-01-4	Vinyl Chloride	ND	0.63	ND	0.25	
106-99-0	1,3-Butadiene	ND	0.62	ND	0.28	
74-83-9	Bromomethane	ND	0.63	ND	0.16	
75-00-3	Chloroethane	ND	0.63	ND	0.24	
64-17-5	Ethanol	ND	6.1	ND	3.2	
75-05-8	Acetonitrile	ND	0.62	ND	0.37	
107-02-8	Acrolein	ND	1.2	ND	0.51	
67-64-1	Acetone	ND	6.2	ND	2.6	
75-69-4	Trichlorofluoromethane (CFC 11)	**1.1**	0.62	**0.20**	0.11	
67-63-0	2-Propanol (Isopropyl Alcohol)	ND	2.5	ND	1.0	
107-13-1	Acrylonitrile	ND	0.62	ND	0.29	
75-35-4	1,1-Dichloroethene	ND	0.63	ND	0.16	
75-09-2	Methylene Chloride	**0.79**	0.62	**0.23**	0.18	
107-05-1	3-Chloro-1-propene (Allyl Chloride)	ND	0.63	ND	0.20	
76-13-1	Trichlorotrifluoroethane (CFC 113)	**2.0**	0.63	**0.26**	0.082	
75-15-0	Carbon Disulfide	ND	1.3	ND	0.41	
156-60-5	trans-1,2-Dichloroethene	ND	0.63	ND	0.16	
75-34-3	1,1-Dichloroethane	ND	0.64	ND	0.16	
1634-04-4	Methyl tert-Butyl Ether	ND	0.63	ND	0.18	
108-05-4	Vinyl Acetate	ND	6.3	ND	1.8	**L**
78-93-3	2-Butanone (MEK)	ND	1.3	ND	0.44	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.
L = Laboratory control sample recovery outside the specified limits, results may be biased high.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **Bhate Environmental Associates, Inc.**
Client Sample ID: **LH18/24-Air_022420_Downwind** ALS Project ID: P2001177
Client Project ID: **LHAAP GWTP / NW01312.0150** ALS Sample ID: P2001177-004

Test Code: EPA TO-15 Date Collected: 2/25/20
Instrument ID: Tekmar AUTOCAN/Agilent 5975Binert/6890N/MS13 Date Received: 3/2/20
Analyst: Wida Ang Date Analyzed: 3/12/20
Sample Type: 6.0 L Silonite Canister Volume(s) Analyzed: 1.00 Liter(s)
Test Notes:
Container ID: AS00322

Initial Pressure (psig): 1.30 Final Pressure (psig): 3.96

Canister Dilution Factor: 1.17

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	ND	0.62	ND	0.16	
141-78-6	Ethyl Acetate	**3.4**	1.3	**0.95**	0.36	
110-54-3	n-Hexane	**0.70**	0.63	**0.20**	0.18	
67-66-3	Chloroform	ND	0.63	ND	0.13	
109-99-9	Tetrahydrofuran (THF)	ND	0.64	ND	0.22	
107-06-2	1,2-Dichloroethane	ND	0.63	ND	0.16	
71-55-6	1,1,1-Trichloroethane	ND	0.63	ND	0.12	
71-43-2	Benzene	ND	0.62	ND	0.19	
56-23-5	Carbon Tetrachloride	ND	0.62	ND	0.099	
110-82-7	Cyclohexane	ND	1.3	ND	0.37	
78-87-5	1,2-Dichloropropane	ND	0.63	ND	0.14	
75-27-4	Bromodichloromethane	ND	0.63	ND	0.094	
79-01-6	Trichloroethene	**1.3**	0.63	**0.24**	0.12	
123-91-1	1,4-Dioxane	ND	0.63	ND	0.18	
80-62-6	Methyl Methacrylate	ND	1.3	ND	0.31	
142-82-5	n-Heptane	ND	0.63	ND	0.15	
10061-01-5	cis-1,3-Dichloropropene	ND	0.61	ND	0.13	
108-10-1	4-Methyl-2-pentanone	ND	0.62	ND	0.15	
10061-02-6	trans-1,3-Dichloropropene	ND	0.62	ND	0.14	
79-00-5	1,1,2-Trichloroethane	ND	0.63	ND	0.12	
108-88-3	Toluene	ND	0.63	ND	0.17	
591-78-6	2-Hexanone	ND	0.63	ND	0.15	
124-48-1	Dibromochloromethane	ND	0.63	ND	0.074	
106-93-4	1,2-Dibromoethane	ND	0.63	ND	0.082	
123-86-4	n-Butyl Acetate	ND	0.64	ND	0.14	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **Bhate Environmental Associates, Inc.**
Client Sample ID: **LH18/24-Air_022420_Downwind** ALS Project ID: P2001177
Client Project ID: **LHAAP GWTP / NW01312.0150** ALS Sample ID: P2001177-004

Test Code: EPA TO-15 Date Collected: 2/25/20
Instrument ID: Tekmar AUTOCAN/Agilent 5975Binert/6890N/MS13 Date Received: 3/2/20
Analyst: Wida Ang Date Analyzed: 3/12/20
Sample Type: 6.0 L Silonite Canister Volume(s) Analyzed: 1.00 Liter(s)
Test Notes:
Container ID: AS00322

Initial Pressure (psig): 1.30 Final Pressure (psig): 3.96

Canister Dilution Factor: 1.17

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
111-65-9	n-Octane	ND	0.63	ND	0.14	
127-18-4	Tetrachloroethene	ND	0.61	ND	0.090	
108-90-7	Chlorobenzene	ND	0.63	ND	0.14	
100-41-4	Ethylbenzene	ND	0.63	ND	0.15	
179601-23-1	m,p-Xylenes	ND	1.3	ND	0.30	
75-25-2	Bromoform	ND	0.63	ND	0.061	
100-42-5	Styrene	ND	0.62	ND	0.15	
95-47-6	o-Xylene	ND	0.63	ND	0.15	
111-84-2	n-Nonane	ND	0.63	ND	0.12	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.63	ND	0.092	
98-82-8	Cumene	ND	0.63	ND	0.13	
80-56-8	alpha-Pinene	ND	0.63	ND	0.11	
103-65-1	n-Propylbenzene	ND	0.63	ND	0.13	
622-96-8	4-Ethyltoluene	ND	0.63	ND	0.13	
108-67-8	1,3,5-Trimethylbenzene	ND	0.62	ND	0.13	
95-63-6	1,2,4-Trimethylbenzene	ND	0.63	ND	0.13	
100-44-7	Benzyl Chloride	ND	1.3	ND	0.25	
541-73-1	1,3-Dichlorobenzene	ND	0.63	ND	0.11	
106-46-7	1,4-Dichlorobenzene	ND	0.63	ND	0.11	
95-50-1	1,2-Dichlorobenzene	ND	0.63	ND	0.11	
5989-27-5	d-Limonene	ND	0.63	ND	0.11	
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.62	ND	0.064	
120-82-1	1,2,4-Trichlorobenzene	ND	0.63	ND	0.085	
91-20-3	Naphthalene	ND	0.61	ND	0.12	
87-68-3	Hexachlorobutadiene	ND	0.62	ND	0.058	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **Bhate Environmental Associates, Inc.**
Client Sample ID: **Method Blank** ALS Project ID: P2001177
Client Project ID: **LHAAP GWTP / NW01312.0150** ALS Sample ID: P200312-MB

Test Code: EPA TO-15 Date Collected: NA
Instrument ID: Tekmar AUTOCAN/Agilent 5975Binert/6890N/MS13 Date Received: NA
Analyst: Wida Ang Date Analyzed: 3/12/20
Sample Type: 6.0 L Summa Canister Volume(s) Analyzed: 1.00 Liter(s)
Test Notes:

Canister Dilution Factor: 1.00

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
115-07-1	Propene	ND	0.53	ND	0.31	
75-71-8	Dichlorodifluoromethane (CFC 12)	ND	0.53	ND	0.11	
74-87-3	Chloromethane	ND	0.53	ND	0.26	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	0.53	ND	0.076	
75-01-4	Vinyl Chloride	ND	0.54	ND	0.21	
106-99-0	1,3-Butadiene	ND	0.53	ND	0.24	
74-83-9	Bromomethane	ND	0.54	ND	0.14	
75-00-3	Chloroethane	ND	0.54	ND	0.20	
64-17-5	Ethanol	ND	5.2	ND	2.8	
75-05-8	Acetonitrile	ND	0.53	ND	0.32	
107-02-8	Acrolein	ND	1.0	ND	0.44	
67-64-1	Acetone	ND	5.3	ND	2.2	
75-69-4	Trichlorofluoromethane (CFC 11)	ND	0.53	ND	0.094	
67-63-0	2-Propanol (Isopropyl Alcohol)	ND	2.1	ND	0.85	
107-13-1	Acrylonitrile	ND	0.53	ND	0.24	
75-35-4	1,1-Dichloroethene	ND	0.54	ND	0.14	
75-09-2	Methylene Chloride	ND	0.53	ND	0.15	
107-05-1	3-Chloro-1-propene (Allyl Chloride)	ND	0.54	ND	0.17	
76-13-1	Trichlorotrifluoroethane (CFC 113)	ND	0.54	ND	0.070	
75-15-0	Carbon Disulfide	ND	1.1	ND	0.35	
156-60-5	trans-1,2-Dichloroethene	ND	0.54	ND	0.14	
75-34-3	1,1-Dichloroethane	ND	0.55	ND	0.14	
1634-04-4	Methyl tert-Butyl Ether	ND	0.54	ND	0.15	
108-05-4	Vinyl Acetate	ND	5.4	ND	1.5	**L**
78-93-3	2-Butanone (MEK)	ND	1.1	ND	0.37	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.
L = Laboratory control sample recovery outside the specified limits, results may be biased high.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **Bhate Environmental Associates, Inc.**
Client Sample ID: **Method Blank** ALS Project ID: P2001177
Client Project ID: **LHAAP GWTP / NW01312.0150** ALS Sample ID: P200312-MB

Test Code: EPA TO-15 Date Collected: NA
Instrument ID: Tekmar AUTOCAN/Agilent 5975Binert/6890N/MS13 Date Received: NA
Analyst: Wida Ang Date Analyzed: 3/12/20
Sample Type: 6.0 L Summa Canister Volume(s) Analyzed: 1.00 Liter(s)
Test Notes:

Canister Dilution Factor: 1.00

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	ND	0.53	ND	0.13	
141-78-6	Ethyl Acetate	ND	1.1	ND	0.31	
110-54-3	n-Hexane	ND	0.54	ND	0.15	
67-66-3	Chloroform	ND	0.54	ND	0.11	
109-99-9	Tetrahydrofuran (THF)	ND	0.55	ND	0.19	
107-06-2	1,2-Dichloroethane	ND	0.54	ND	0.13	
71-55-6	1,1,1-Trichloroethane	ND	0.54	ND	0.099	
71-43-2	Benzene	ND	0.53	ND	0.17	
56-23-5	Carbon Tetrachloride	ND	0.53	ND	0.084	
110-82-7	Cyclohexane	ND	1.1	ND	0.32	
78-87-5	1,2-Dichloropropane	ND	0.54	ND	0.12	
75-27-4	Bromodichloromethane	ND	0.54	ND	0.081	
79-01-6	Trichloroethene	ND	0.54	ND	0.10	
123-91-1	1,4-Dioxane	ND	0.54	ND	0.15	
80-62-6	Methyl Methacrylate	ND	1.1	ND	0.27	
142-82-5	n-Heptane	ND	0.54	ND	0.13	
10061-01-5	cis-1,3-Dichloropropene	ND	0.52	ND	0.11	
108-10-1	4-Methyl-2-pentanone	ND	0.53	ND	0.13	
10061-02-6	trans-1,3-Dichloropropene	ND	0.53	ND	0.12	
79-00-5	1,1,2-Trichloroethane	ND	0.54	ND	0.099	
108-88-3	Toluene	ND	0.54	ND	0.14	
591-78-6	2-Hexanone	ND	0.54	ND	0.13	
124-48-1	Dibromochloromethane	ND	0.54	ND	0.063	
106-93-4	1,2-Dibromoethane	ND	0.54	ND	0.070	
123-86-4	n-Butyl Acetate	ND	0.55	ND	0.12	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **Bhate Environmental Associates, Inc.**
Client Sample ID: **Method Blank** ALS Project ID: P2001177
Client Project ID: **LHAAP GWTP / NW01312.0150** ALS Sample ID: P200312-MB

Test Code: EPA TO-15 Date Collected: NA
Instrument ID: Tekmar AUTOCAN/Agilent 5975Binert/6890N/MS13 Date Received: NA
Analyst: Wida Ang Date Analyzed: 3/12/20
Sample Type: 6.0 L Summa Canister Volume(s) Analyzed: 1.00 Liter(s)
Test Notes:

Canister Dilution Factor: 1.00

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
111-65-9	n-Octane	ND	0.54	ND	0.12	
127-18-4	Tetrachloroethene	ND	0.52	ND	0.077	
108-90-7	Chlorobenzene	ND	0.54	ND	0.12	
100-41-4	Ethylbenzene	ND	0.54	ND	0.12	
179601-23-1	m,p-Xylenes	ND	1.1	ND	0.25	
75-25-2	Bromoform	ND	0.54	ND	0.052	
100-42-5	Styrene	ND	0.53	ND	0.12	
95-47-6	o-Xylene	ND	0.54	ND	0.12	
111-84-2	n-Nonane	ND	0.54	ND	0.10	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.54	ND	0.079	
98-82-8	Cumene	ND	0.54	ND	0.11	
80-56-8	alpha-Pinene	ND	0.54	ND	0.097	
103-65-1	n-Propylbenzene	ND	0.54	ND	0.11	
622-96-8	4-Ethyltoluene	ND	0.54	ND	0.11	
108-67-8	1,3,5-Trimethylbenzene	ND	0.53	ND	0.11	
95-63-6	1,2,4-Trimethylbenzene	ND	0.54	ND	0.11	
100-44-7	Benzyl Chloride	ND	1.1	ND	0.21	
541-73-1	1,3-Dichlorobenzene	ND	0.54	ND	0.090	
106-46-7	1,4-Dichlorobenzene	ND	0.54	ND	0.090	
95-50-1	1,2-Dichlorobenzene	ND	0.54	ND	0.090	
5989-27-5	d-Limonene	ND	0.54	ND	0.097	
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.53	ND	0.055	
120-82-1	1,2,4-Trichlorobenzene	ND	0.54	ND	0.073	
91-20-3	Naphthalene	ND	0.52	ND	0.099	
87-68-3	Hexachlorobutadiene	ND	0.53	ND	0.050	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

SURROGATE SPIKE RECOVERY RESULTS

Client: **Bhate Environmental Associates, Inc.**
Client Project ID: **LHAAP GWTP / NW01312.0150** ALS Project ID: P2001177

Test Code: EPA TO-15
Instrument ID: Tekmar AUTOCAN/Agilent 5975Binert/6890N/MS13 Date(s) Collected: 2/24 - 2/25/20
Analyst: Wida Ang Date(s) Received: 3/2/20
Sample Type: 6.0 L Summa Canister(s) / 6.0 L Silonite Canister(s) Date(s) Analyzed: 3/12/20
Test Notes:

Client Sample ID	ALS Sample ID	1,2-Dichloroethane-d4 Percent Recovered	Toluene-d8 Percent Recovered	Bromofluorobenzene Percent Recovered	Acceptance Limits	Data Qualifier
Method Blank	P200312-MB	**103**	**100**	**98**	70-130	
Lab Control Sample	P200312-LCS	**99**	**101**	**99**	70-130	
LH18/24-Air_022420_Stripper	P2001177-001	**97**	**100**	**98**	70-130	
LH18/24-Air_022420_Stripper_a	P2001177-002	**98**	**100**	**98**	70-130	
LH18/24-Air_022420_GWTP	P2001177-003	**104**	**100**	**97**	70-130	
LH18/24-Air_022420_Downwind	P2001177-004	**103**	**100**	**99**	70-130	

Surrogate percent recovery is verified and accepted based on the on-column result.
Reported results are shown in concentration units and as a result of the calculation, may vary slightly from the on-column percent recovery.

ALS ENVIRONMENTAL

LABORATORY CONTROL SAMPLE SUMMARY

Client: **Bhate Environmental Associates, Inc.**
Client Sample ID: **Lab Control Sample** ALS Project ID: P2001177
Client Project ID: **LHAAP GWTP / NW01312.0150** ALS Sample ID: P200312-LCS

Test Code: EPA TO-15 Date Collected: NA
Instrument ID: Tekmar AUTOCAN/Agilent 5975Binert/6890N/MS13 Date Received: NA
Analyst: Wida Ang Date Analyzed: 3/12/20
Sample Type: 6.0 L Summa Canister Volume(s) Analyzed: 0.125 Liter(s)
Test Notes:

CAS #	Compound	Spike Amount µg/m³	**Result µg/m³**	**% Recovery**	ALS Acceptance Limits	**Data Qualifier**
115-07-1	Propene	210	**218**	**104**	51-133	
75-71-8	Dichlorodifluoromethane (CFC 12)	210	**211**	**100**	64-115	
74-87-3	Chloromethane	212	**174**	**82**	49-127	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	206	**202**	**98**	65-114	
75-01-4	Vinyl Chloride	212	**228**	**108**	61-129	
106-99-0	1,3-Butadiene	212	**245**	**116**	54-140	
74-83-9	Bromomethane	212	**219**	**103**	68-120	
75-00-3	Chloroethane	214	**216**	**101**	63-123	
64-17-5	Ethanol	1,060	**1060**	**100**	49-134	
75-05-8	Acetonitrile	214	**219**	**102**	50-137	
107-02-8	Acrolein	206	**247**	**120**	62-128	
67-64-1	Acetone	1,070	**1040**	**97**	56-125	
75-69-4	Trichlorofluoromethane (CFC 11)	212	**211**	**100**	64-115	
67-63-0	2-Propanol (Isopropyl Alcohol)	422	**465**	**110**	57-133	
107-13-1	Acrylonitrile	212	**247**	**117**	64-136	
75-35-4	1,1-Dichloroethene	214	**226**	**106**	67-115	
75-09-2	Methylene Chloride	210	**218**	**104**	68-114	
107-05-1	3-Chloro-1-propene (Allyl Chloride)	214	**228**	**107**	55-139	
76-13-1	Trichlorotrifluoroethane (CFC 113)	216	**222**	**103**	65-115	
75-15-0	Carbon Disulfide	212	**201**	**95**	68-113	
156-60-5	trans-1,2-Dichloroethene	214	**240**	**112**	65-122	
75-34-3	1,1-Dichloroethane	212	**219**	**103**	63-118	
1634-04-4	Methyl tert-Butyl Ether	214	**147**	**69**	57-131	
108-05-4	Vinyl Acetate	1,070	**1410**	**132**	71-128	**L**
78-93-3	2-Butanone (MEK)	212	**243**	**115**	67-123	

Laboratory Control Sample percent recovery is verified and accepted based on the on-column result.
Reported results are shown in concentration units and as a result of the calculation, may vary slightly.
L = Laboratory control sample recovery outside the specified limits, results may be biased high.

ALS ENVIRONMENTAL

LABORATORY CONTROL SAMPLE SUMMARY

Client: **Bhate Environmental Associates, Inc.**
Client Sample ID: **Lab Control Sample** ALS Project ID: P2001177
Client Project ID: **LHAAP GWTP / NW01312.0150** ALS Sample ID: P200312-LCS

Test Code: EPA TO-15 Date Collected: NA
Instrument ID: Tekmar AUTOCAN/Agilent 5975Binert/6890N/MS13 Date Received: NA
Analyst: Wida Ang Date Analyzed: 3/12/20
Sample Type: 6.0 L Summa Canister Volume(s) Analyzed: 0.125 Liter(s)
Test Notes:

CAS #	Compound	Spike Amount µg/m³	Result µg/m³	% Recovery	ALS Acceptance Limits	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	212	**226**	**107**	64-120	
141-78-6	Ethyl Acetate	432	**471**	**109**	64-131	
110-54-3	n-Hexane	216	**224**	**104**	58-125	
67-66-3	Chloroform	214	**220**	**103**	65-114	
109-99-9	Tetrahydrofuran (THF)	220	**231**	**105**	65-115	
107-06-2	1,2-Dichloroethane	214	**223**	**104**	59-119	
71-55-6	1,1,1-Trichloroethane	214	**220**	**103**	66-115	
71-43-2	Benzene	210	**202**	**96**	66-109	
56-23-5	Carbon Tetrachloride	208	**215**	**103**	66-119	
110-82-7	Cyclohexane	422	**436**	**103**	67-117	
78-87-5	1,2-Dichloropropane	214	**223**	**104**	66-119	
75-27-4	Bromodichloromethane	218	**226**	**104**	71-119	
79-01-6	Trichloroethene	216	**220**	**102**	70-114	
123-91-1	1,4-Dioxane	216	**251**	**116**	71-117	
80-62-6	Methyl Methacrylate	430	**469**	**109**	76-121	
142-82-5	n-Heptane	214	**226**	**106**	66-119	
10061-01-5	cis-1,3-Dichloropropene	214	**235**	**110**	72-125	
108-10-1	4-Methyl-2-pentanone	212	**231**	**109**	68-130	
10061-02-6	trans-1,3-Dichloropropene	212	**237**	**112**	71-132	
79-00-5	1,1,2-Trichloroethane	214	**225**	**105**	70-117	
108-88-3	Toluene	212	**219**	**103**	67-113	
591-78-6	2-Hexanone	216	**240**	**111**	62-135	
124-48-1	Dibromochloromethane	214	**234**	**109**	73-126	
106-93-4	1,2-Dibromoethane	214	**240**	**112**	71-122	
123-86-4	n-Butyl Acetate	218	**254**	**117**	65-134	

Laboratory Control Sample percent recovery is verified and accepted based on the on-column result.
Reported results are shown in concentration units and as a result of the calculation, may vary slightly.

ALS ENVIRONMENTAL

LABORATORY CONTROL SAMPLE SUMMARY

Client: **Bhate Environmental Associates, Inc.**
Client Sample ID: **Lab Control Sample** ALS Project ID: P2001177
Client Project ID: **LHAAP GWTP / NW01312.0150** ALS Sample ID: P200312-LCS

Test Code: EPA TO-15 Date Collected: NA
Instrument ID: Tekmar AUTOCAN/Agilent 5975Binert/6890N/MS13 Date Received: NA
Analyst: Wida Ang Date Analyzed: 3/12/20
Sample Type: 6.0 L Summa Canister Volume(s) Analyzed: 0.125 Liter(s)
Test Notes:

CAS #	Compound	Spike Amount µg/m³	Result µg/m³	% Recovery	ALS Acceptance Limits	Data Qualifier
111-65-9	n-Octane	216	**231**	**107**	63-120	
127-18-4	Tetrachloroethene	208	**214**	**103**	64-120	
108-90-7	Chlorobenzene	214	**215**	**100**	65-116	
100-41-4	Ethylbenzene	212	**228**	**108**	65-117	
179601-23-1	m,p-Xylenes	426	**449**	**105**	64-121	
75-25-2	Bromoform	214	**244**	**114**	72-130	
100-42-5	Styrene	212	**250**	**118**	72-126	
95-47-6	o-Xylene	214	**225**	**105**	64-120	
111-84-2	n-Nonane	214	**228**	**107**	56-132	
79-34-5	1,1,2,2-Tetrachloroethane	214	**229**	**107**	66-122	
98-82-8	Cumene	214	**223**	**104**	64-121	
80-56-8	alpha-Pinene	212	**241**	**114**	62-136	
103-65-1	n-Propylbenzene	214	**227**	**106**	65-123	
622-96-8	4-Ethyltoluene	210	**217**	**103**	71-126	
108-67-8	1,3,5-Trimethylbenzene	212	**221**	**104**	65-120	
95-63-6	1,2,4-Trimethylbenzene	212	**230**	**108**	63-129	
100-44-7	Benzyl Chloride	214	**267**	**125**	66-138	
541-73-1	1,3-Dichlorobenzene	214	**228**	**107**	65-127	
106-46-7	1,4-Dichlorobenzene	214	**229**	**107**	65-125	
95-50-1	1,2-Dichlorobenzene	214	**230**	**107**	67-128	
5989-27-5	d-Limonene	212	**252**	**119**	65-136	
96-12-8	1,2-Dibromo-3-chloropropane	214	**235**	**110**	73-133	
120-82-1	1,2,4-Trichlorobenzene	216	**254**	**118**	62-140	
91-20-3	Naphthalene	212	**254**	**120**	57-149	
87-68-3	Hexachlorobutadiene	214	**218**	**102**	57-129	

Laboratory Control Sample percent recovery is verified and accepted based on the on-column result.
Reported results are shown in concentration units and as a result of the calculation, may vary slightly.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **Bhate Environmental Associates, Inc.** ALS Project ID: P2001177
Client Project ID: **LHAAP GWTP / NW01312.0150**

Internal Standard Area and RT Summary

Test Code: EPA TO-15
Instrument ID: Tekmar AUTOCAN/Agilent 5975Binert/6890N/MS13 Lab File ID: 03122002.D
Analyst: Wida Ang Date Analyzed: 3/12/20
Sample Type: 6.0 L Summa Canister(s) Time Analyzed: 00:55
Test Notes:

		IS1 (BCM)		IS2 (DFB)		IS3 (CBZ)	
		AREA #	RT #	AREA #	RT #	AREA #	RT #
	24 Hour Standard	137420	11.23	617774	13.35	270435	17.67
	Upper Limit	192388	11.56	864884	13.68	378609	18.00
	Lower Limit	82452	10.90	370664	13.02	162261	17.34
	Client Sample ID						
01	Method Blank	126898	11.22	594173	13.35	260127	17.67
02	Lab Control Sample	137507	11.24	622105	13.36	269342	17.67
04	LH18/24-Air_022420_Stripper	158544	11.23	688480	13.35	303066	17.67
05	LH18/24-Air_022420_Stripper_a	156324	11.23	675567	13.36	296889	17.67
06	LH18/24-Air_022420_GWTP	128578	11.22	598597	13.35	263994	17.67
07	LH18/24-Air_022420_Downwind	126256	11.22	587286	13.35	258795	17.67
08							
09							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							

IS1 (BCM) = Bromochloromethane
IS2 (DFB) = 1,4-Difluorobenzene
IS3 (CBZ) = Chlorobenzene-d5

AREA UPPER LIMIT = 140% of internal standard area
AREA LOWER LIMIT = 60% of internal standard area
RT UPPER LIMIT = 0.33 minutes of internal standard RT
RT LOWER LIMIT = 0.33 minutes of internal standard RT

# Column used to flag values outside QC limits with an I.
I = Internal standard not within the specified limits.

Quantitation Report (QT Reviewed)

Data File : I:\MS13\DATA\2020 03\12\03122017.D Vial: 5
Acq On : 12 Mar 2020 10:52 Operator: WA
Sample : P2001177-001 (15mL) Inst : MS13
Misc : S31-01272001

Quant Time: Mar 16 13:29:33 2020
Quant Method : I:\MS13\METHODS\R13031120.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Mar 12 06:29:07 2020 3/16/20
Response via : Initial Calibration
DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.23	130	158544	12.500	ng	-0.02
37) 1,4-Difluorobenzene (IS2)	13.35	114	688480	12.500	ng	-0.01
56) Chlorobenzene-d5 (IS3)	17.67	82	303066	12.500	ng	0.00
System Monitoring Compounds						
33) 1,2-Dichloroethane-d4(...	12.08	65	213249	12.152	ng	-0.02
Spiked Amount 12.500	Range 70 - 130		Recovery = 97.20%			
57) Toluene-d8 (SS2)	15.80	98	766772	12.485	ng	0.00
Spiked Amount 12.500	Range 70 - 130		Recovery = 99.84%			
73) Bromofluorobenzene (SS3)	19.05	174	213130	12.221	ng	0.00
Spiked Amount 12.500	Range 70 - 130		Recovery = 97.76%			
Target Compounds						Qvalue
2) Propene	4.20	42	503	N.D.		
3) Dichlorodifluoromethan...	4.34	85	841	N.D.		
4) Chloromethane	0.00	50	0	N.D.		
5) 1,2-Dichloro-1,1,2,2-t...	0.00	135	0	N.D.		
6) Vinyl Chloride	5.03	62	76255	3.308	ng	100
7) 1,3-Butadiene	0.00	54	0	N.D.		
8) Bromomethane	0.00	94	0	N.D.		
9) Chloroethane	0.00	64	0	N.D.		
10) Ethanol	6.57	45	66	N.D.		
11) Acetonitrile	0.00	41	0	N.D.		
12) Acrolein	0.00	56	0	N.D.		
13) Acetone	7.12	58	53212	4.261	ng	97
14) Trichlorofluoromethane	7.33	101	175	N.D.		
15) 2-Propanol (Isopropanol)	7.71	45	3940	N.D.		
16) Acrylonitrile	0.00	53	0	N.D.		
17) 1,1-Dichloroethene	8.29	96	33374	2.274	ng	98
18) 2-Methyl-2-Propanol (t...	8.65	59	53	N.D.		
19) Methylene Chloride	8.50	84	1416062	91.242	ng	98
20) 3-Chloro-1-propene (Al...	0.00	41	0	N.D.	d	
21) Trichlorotrifluoroethane	8.94	151	2396555	178.737	ng	96
22) Carbon Disulfide	8.78	76	4958	N.D.		
23) trans-1,2-Dichloroethene	9.80	61	7443	N.D.		
24) 1,1-Dichloroethane	10.04	63	8897	N.D.		
25) Methyl tert-Butyl Ether	0.00	73	0	N.D.		
26) Vinyl Acetate	0.00	86	0	N.D.		
27) 2-Butanone (MEK)	10.60	72	3717	N.D.		
28) cis-1,2-Dichloroethene	11.05	61	2101276	103.933	ng	99
29) Diisopropyl Ether	11.41	87	1174	N.D.		
30) Ethyl Acetate	11.45	61	461	N.D.		
31) n-Hexane	11.34	57	114	N.D.		
32) Chloroform	11.40	83	11422	0.463	ng	97
34) Tetrahydrofuran (THF)	11.91	72	252	N.D.		
35) Ethyl tert-Butyl Ether	0.00	87	0	N.D.		
36) 1,2-Dichloroethane	12.20	62	27578	1.550	ng	99
38) 1,1,1-Trichloroethane	12.49	97	1180	N.D.		
39) Isopropyl Acetate	0.00	61	0	N.D.		
40) 1-Butanol	0.00	56	0	N.D.		
41) Benzene	12.96	78	6239	N.D.		
42) Carbon Tetrachloride	13.12	117	3374	N.D.		
43) Cyclohexane	13.26	84	3258	N.D.		
44) tert-Amyl Methyl Ether	0.00	73	0	N.D.		
45) 1,2-Dichloropropane	0.00	63	0	N.D.		
46) Bromodichloromethane	0.00	83	0	N.D.	d	
47) Trichloroethene	14.06	130	3379392	205.317	ng	99
48) 1,4-Dioxane	0.00	88	0	N.D.		
49) 2,2,4-Trimethylpentane...	0.00	57	0	N.D.		
50) Methyl Methacrylate	0.00	100	0	N.D.	d	

Data File : I:\MS13\DATA\2020 03\12\03122017.D Vial: 5
Acq On : 12 Mar 2020 10:52 Operator: WA
Sample : P2001177-001 (15mL) Inst : MS13
Misc : S31-01272001

Quant Time: Mar 16 13:29:33 2020
Quant Method : I:\MS13\METHODS\R13031120.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Mar 12 06:29:07 2020
Response via : Initial Calibration
DataAcq Meth:TO15.M

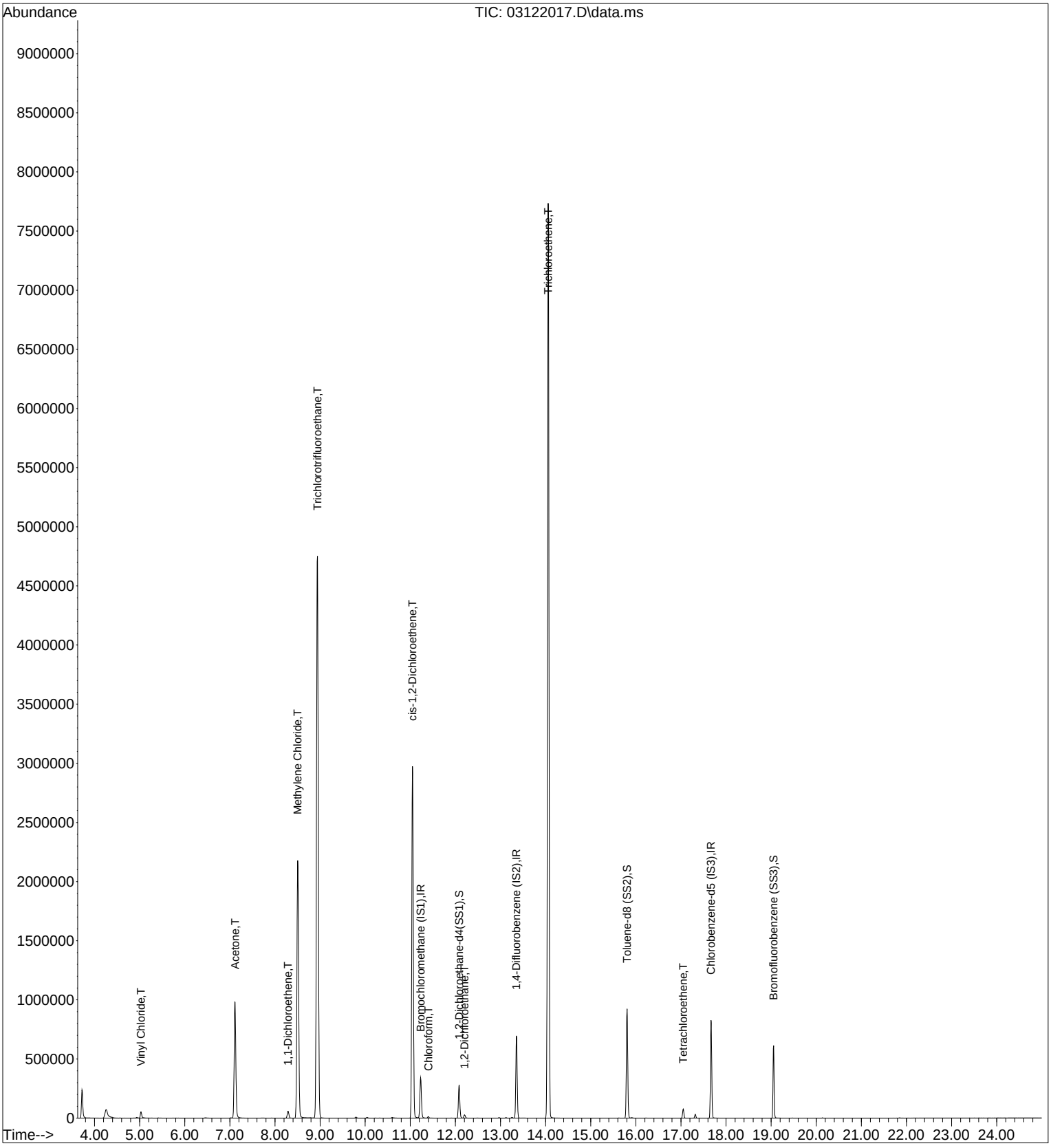
Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
51) n-Heptane	0.00	71	0	N.D.	
52) cis-1,3-Dichloropropene	0.00	75	0	N.D.	
53) 4-Methyl-2-pentanone	0.00	58	0	N.D.	
54) trans-1,3-Dichloropropene	0.00	75	0	N.D.	
55) 1,1,2-Trichloroethane	15.63	97	965	N.D.	
58) Toluene	15.91	91	5180	N.D.	
59) 2-Hexanone	16.21	43	1964	N.D.	
60) Dibromochloromethane	0.00	129	0	N.D.	
61) 1,2-Dibromoethane	0.00	107	0	N.D.	
62) n-Butyl Acetate	0.00	43	0	N.D.	
63) n-Octane	0.00	57	0	N.D.	
64) Tetrachloroethene	17.05	166	30715	1.658 ng	100
65) Chlorobenzene	0.00	112	0	N.D.	
66) Ethylbenzene	18.09	91	381	N.D.	
67) m- & p-Xylenes	18.25	91	584	N.D.	
68) Bromoform	0.00	173	0	N.D.	
69) Styrene	0.00	104	0	N.D.	
70) o-Xylene	18.67	91	240	N.D.	
71) n-Nonane	0.00	43	0	N.D.	
72) 1,1,2,2-Tetrachloroethane	0.00	83	0	N.D.	
74) Cumene	0.00	105	0	N.D.	
75) alpha-Pinene	0.00	93	0	N.D.	
76) n-Propylbenzene	0.00	91	0	N.D.	
77) 3-Ethyltoluene	19.59	105	108	N.D.	
78) 4-Ethyltoluene	19.59	105	108	N.D.	
79) 1,3,5-Trimethylbenzene	0.00	105	0	N.D.	
80) alpha-Methylstyrene	0.00	118	0	N.D.	
81) 2-Ethyltoluene	20.20	105	115	N.D.	
82) 1,2,4-Trimethylbenzene	20.20	105	115	N.D.	
83) n-Decane	0.00	57	0	N.D.	
84) Benzyl Chloride	0.00	91	0	N.D.	
85) 1,3-Dichlorobenzene	0.00	146	0	N.D.	
86) 1,4-Dichlorobenzene	0.00	146	0	N.D.	
87) sec-Butylbenzene	20.20	105	115	N.D.	
88) 4-Isopropyltoluene (p-...	0.00	119	0	N.D.	
89) 1,2,3-Trimethylbenzene	0.00	105	0	N.D.	
90) 1,2-Dichlorobenzene	0.00	146	0	N.D.	
91) d-Limonene	0.00	68	0	N.D.	
92) 1,2-Dibromo-3-Chloropr...	0.00	157	0	N.D.	
93) n-Undecane	0.00	57	0	N.D.	
94) 1,2,4-Trichlorobenzene	0.00	180	0	N.D.	
95) Naphthalene	0.00	128	0	N.D.	
96) n-Dodecane	0.00	57	0	N.D.	
97) Hexachlorobutadiene	0.00	225	0	N.D.	
98) Cyclohexanone	0.00	55	0	N.D.	
99) tert-Butylbenzene	0.00	119	0	N.D.	
100) n-Butylbenzene	0.00	91	0	N.D.	

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data File : I:\MS13\DATA\2020 03\12\03122017.D Vial: 5
Acq On : 12 Mar 2020 10:52 Operator: WA
Sample : P2001177-001 (15mL) Inst : MS13
Misc : S31-01272001

Quant Time: Mar 16 13:29:33 2020
Quant Method : I:\MS13\METHODS\R13031120.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Mar 12 06:29:07 2020
Response via : Initial Calibration
DataAcq Meth:TO15.M



Quantitation Report (QT Reviewed)

Data File : I:\MS13\DATA\2020 03\12\03122017.D Vial: 5
Acq On : 12 Mar 2020 10:52 Operator: WA
Sample : P2001177-001 (15mL) Inst : MS13
Misc : S31-01272001

Quant Time: Mar 16 13:29:33 2020
Quant Method : I:\MS13\METHODS\R13031120.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Mar 12 06:29:07 2020 WA 3/16/20
Response via : Initial Calibration
DataAcq Meth:TO15.M

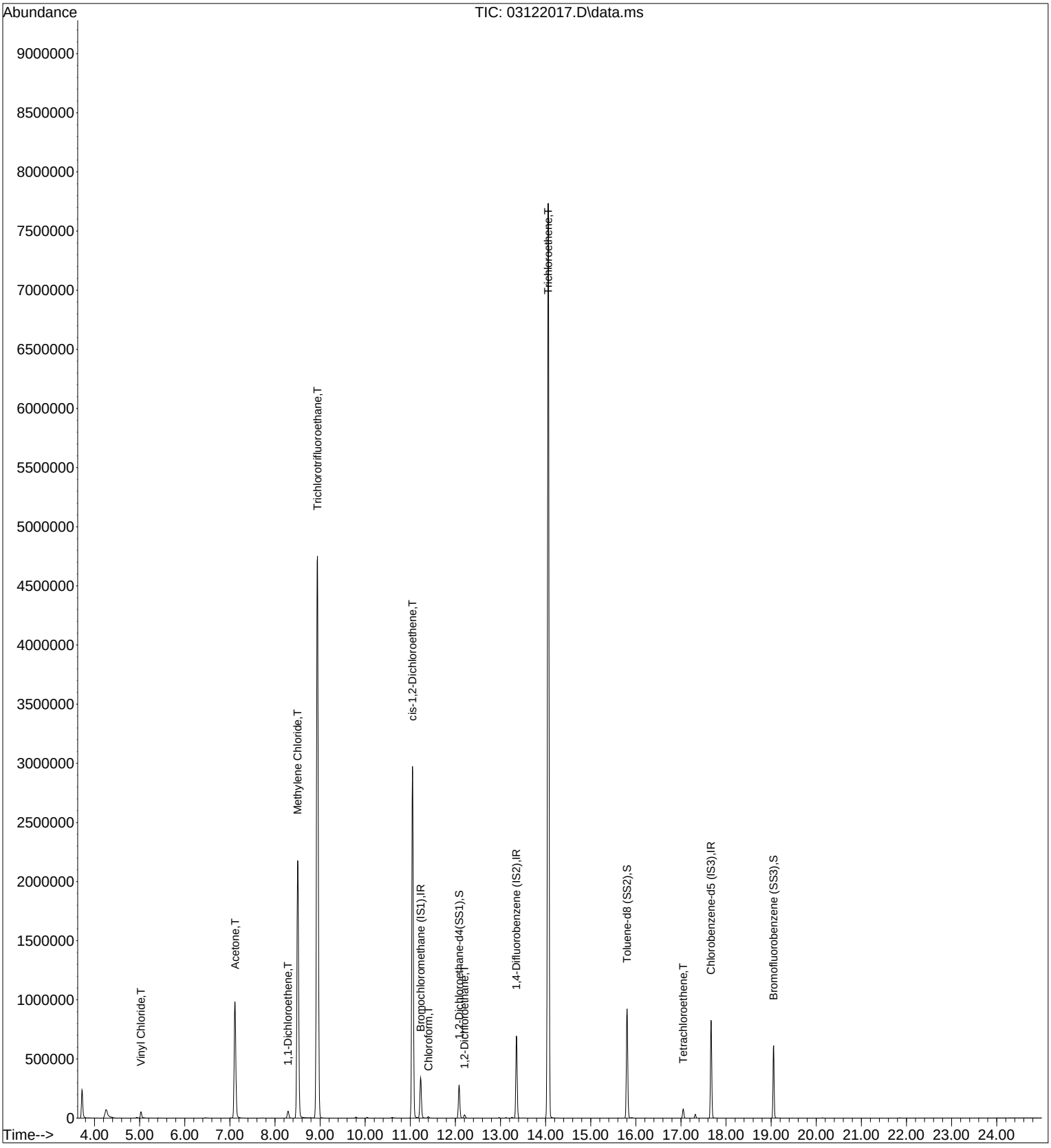
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.23	130	158544	12.500	ng	-0.02
37) 1,4-Difluorobenzene (IS2)	13.35	114	688480	12.500	ng	-0.01
56) Chlorobenzene-d5 (IS3)	17.67	82	303066	12.500	ng	0.00
System Monitoring Compounds						
33) 1,2-Dichloroethane-d4(...	12.08	65	213249	12.152	ng	-0.02
Spiked Amount 12.500	Range 70 - 130		Recovery = 97.20%			
57) Toluene-d8 (SS2)	15.80	98	766772	12.485	ng	0.00
Spiked Amount 12.500	Range 70 - 130		Recovery = 99.84%			
73) Bromofluorobenzene (SS3)	19.05	174	213130	12.221	ng	0.00
Spiked Amount 12.500	Range 70 - 130		Recovery = 97.76%			
Target Compounds						Qvalue
6) Vinyl Chloride	5.03	62	76255	3.308	ng	100
13) Acetone	7.12	58	53212	4.261	ng	97
17) 1,1-Dichloroethene	8.29	96	33374	2.274	ng	98
19) Methylene Chloride	8.50	84	1416062	91.242	ng	98
21) Trichlorotrifluoroethane	8.94	151	2396555	178.737	ng	96
28) cis-1,2-Dichloroethene	11.05	61	2101276	103.933	ng	99
32) Chloroform	11.40	83	11422	0.463	ng	97
36) 1,2-Dichloroethane	12.20	62	27578	1.550	ng	99
47) Trichloroethene	14.06	130	3379392	205.317	ng	99
64) Tetrachloroethene	17.05	166	30715	1.658	ng	100

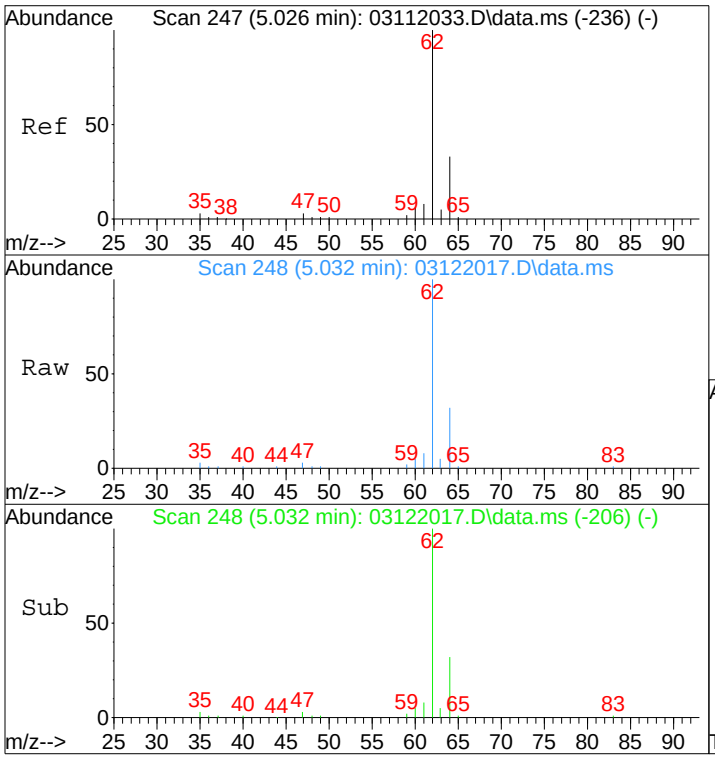
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data File : I:\MS13\DATA\2020 03\12\03122017.D Vial: 5
Acq On : 12 Mar 2020 10:52 Operator: WA
Sample : P2001177-001 (15mL) Inst : MS13
Misc : S31-01272001

Quant Time: Mar 16 13:29:33 2020
Quant Method : I:\MS13\METHODS\R13031120.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Mar 12 06:29:07 2020
Response via : Initial Calibration
DataAcq Meth:TO15.M

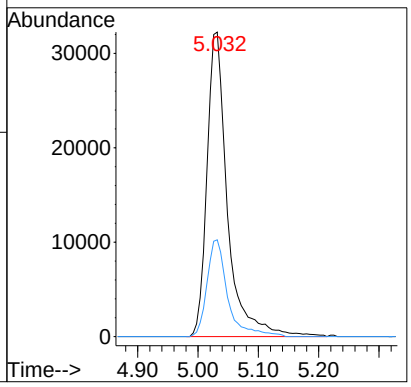


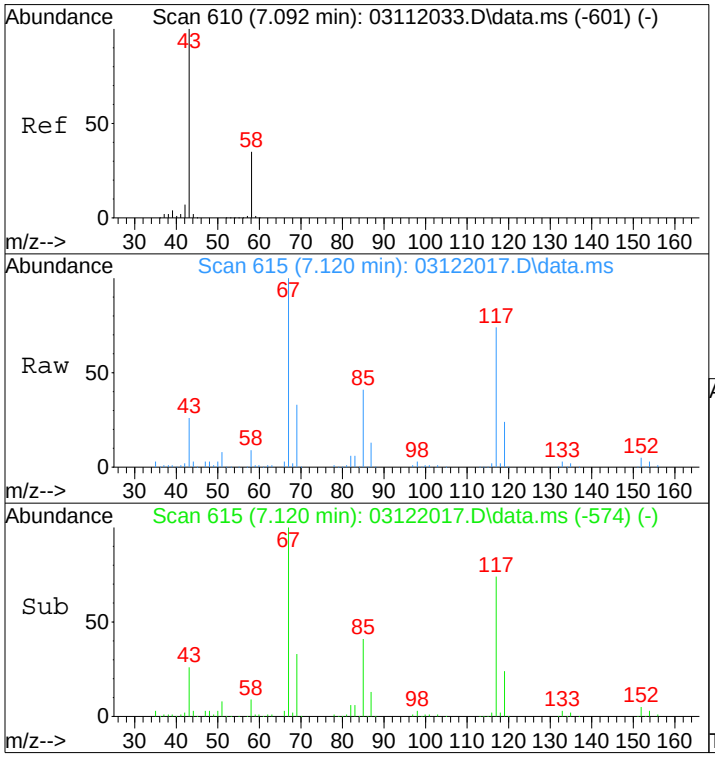


#6
Vinyl Chloride
Concen: 3.31 ng
RT: 5.03 min Scan# 248
Delta R.T. -0.011 min
Lab File: 03122017.D
Acq: 12 Mar 2020 10:52

Tgt Ion: 62 Resp: 76255

Ion	Ratio	Lower	Upper
62	100		
64	32.2	12.3	52.3

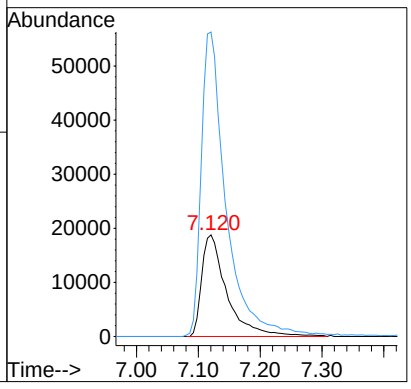


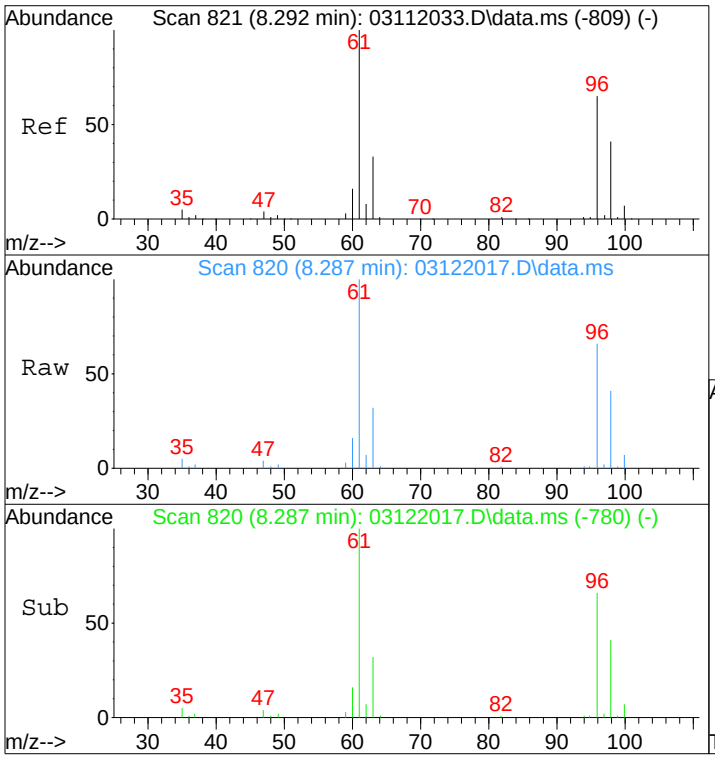


#13
Acetone
Concen: 4.26 ng
RT: 7.12 min Scan# 615
Delta R.T. -0.017 min
Lab File: 03122017.D
Acq: 12 Mar 2020 10:52

Tgt Ion: 58 Resp: 53212

Ion	Ratio	Lower	Upper
58	100		
43	296.1	260.2	320.2

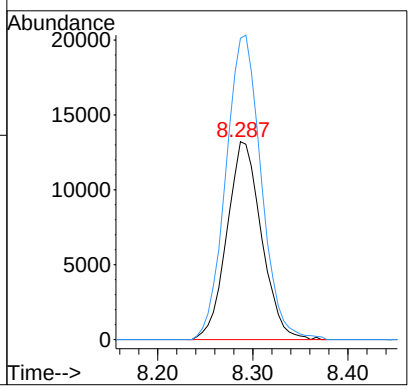


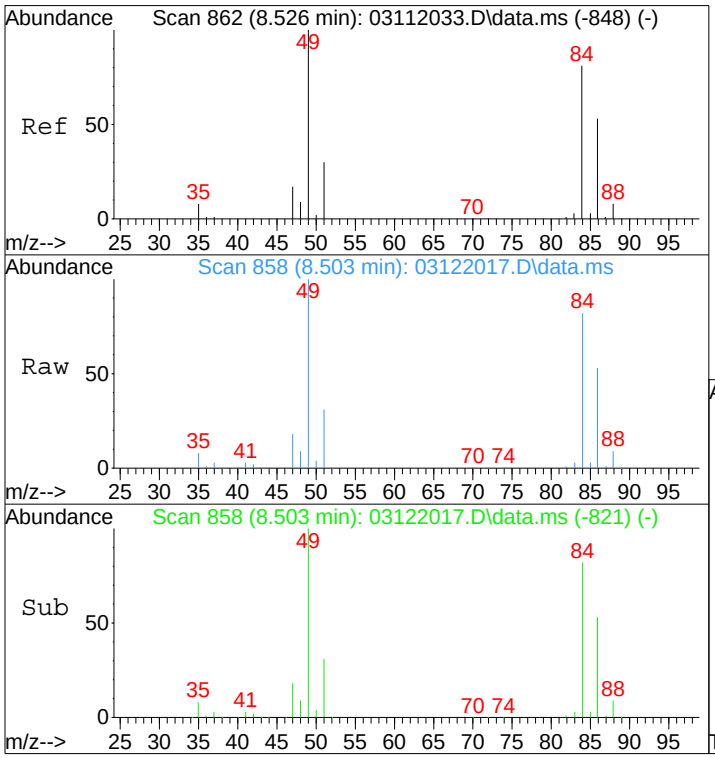


#17
1,1-Dichloroethene
Concen: 2.27 ng
RT: 8.29 min Scan# 820
Delta R.T. -0.023 min
Lab File: 03122017.D
Acq: 12 Mar 2020 10:52

Tgt Ion: 96 Resp: 33374

Ion	Ratio	Lower	Upper
96	100		
61	157.6	135.3	175.3

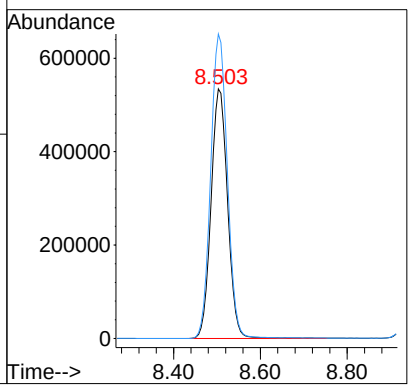


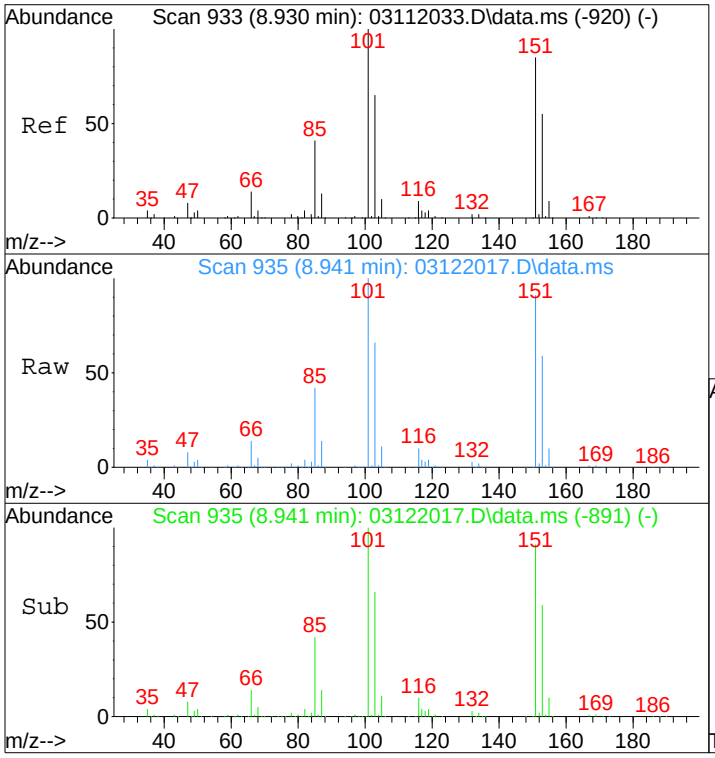


#19
Methylene Chloride
Concen: 91.24 ng
RT: 8.50 min Scan# 858
Delta R.T. -0.040 min
Lab File: 03122017.D
Acq: 12 Mar 2020 10:52

Tgt Ion: 84 Resp: 1416062

Ion	Ratio	Lower	Upper
84	100		
49	123.1	100.8	150.8

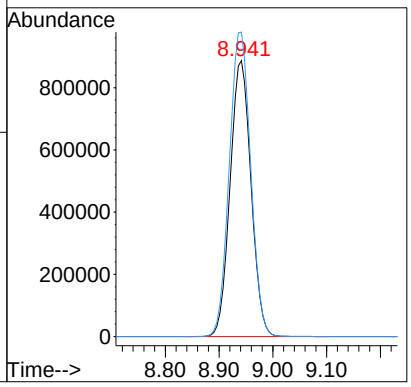


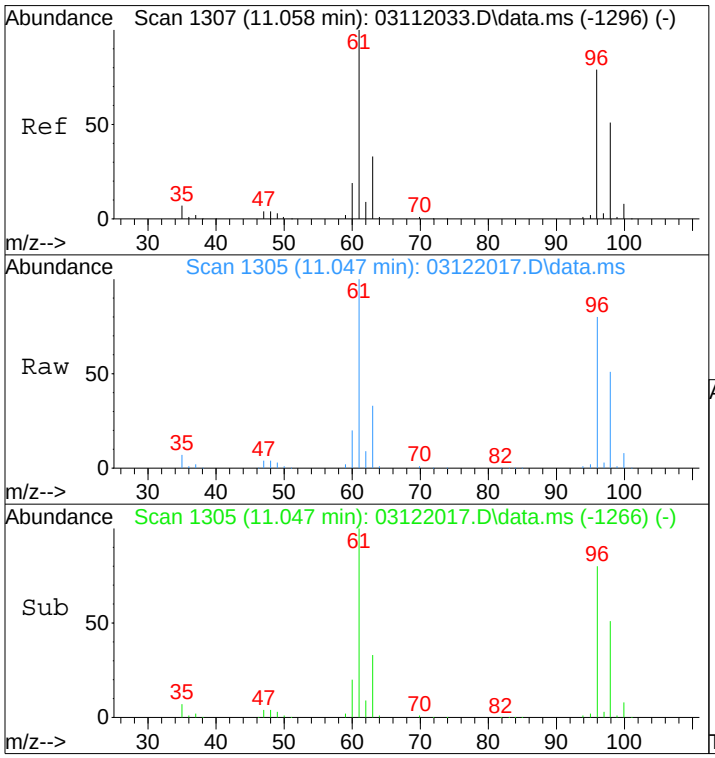


#21
Trichlorotrifluoroethane
Concen: 178.74 ng
RT: 8.94 min Scan# 935
Delta R.T. -0.000 min
Lab File: 03122017.D
Acq: 12 Mar 2020 10:52

Tgt Ion:151 Resp: 2396555

Ion	Ratio	Lower	Upper
151	100		
101	113.2	97.6	137.6

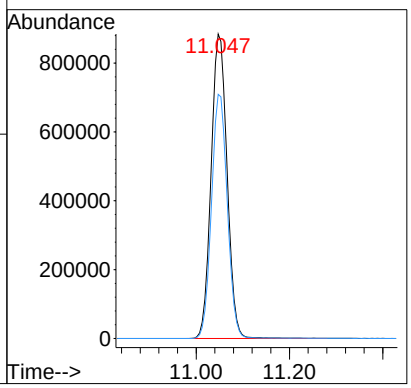


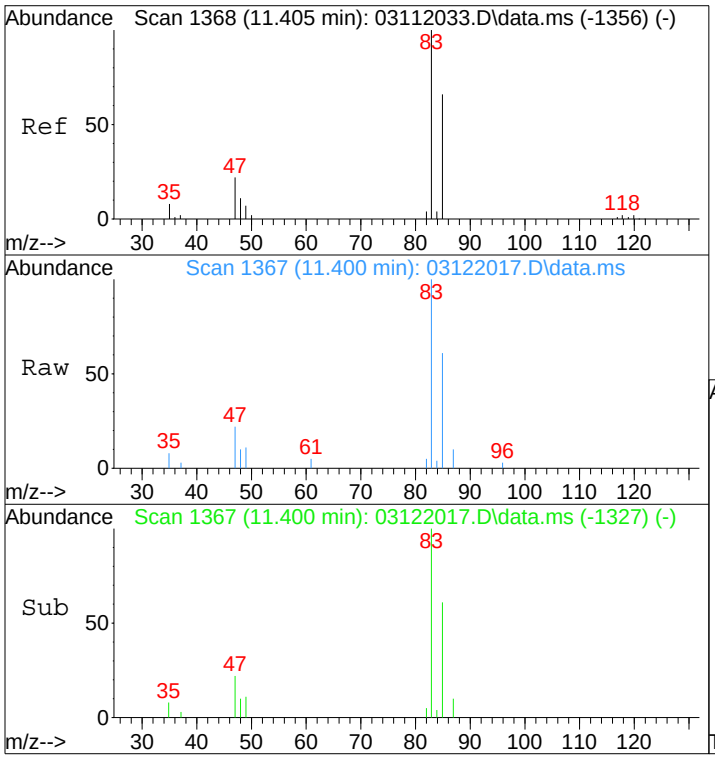


#28
cis-1,2-Dichloroethene
Concen: 103.93 ng
RT: 11.05 min Scan# 1305
Delta R.T. -0.028 min
Lab File: 03122017.D
Acq: 12 Mar 2020 10:52

Tgt Ion: 61 Resp: 2101276

Ion	Ratio	Lower	Upper
61	100		
96	79.8	59.2	99.2

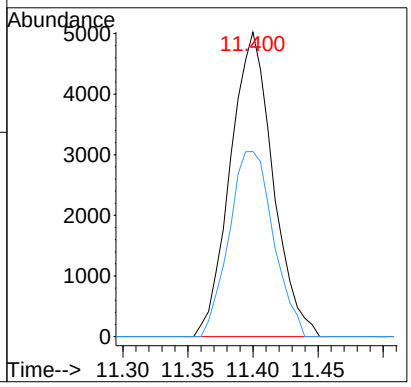


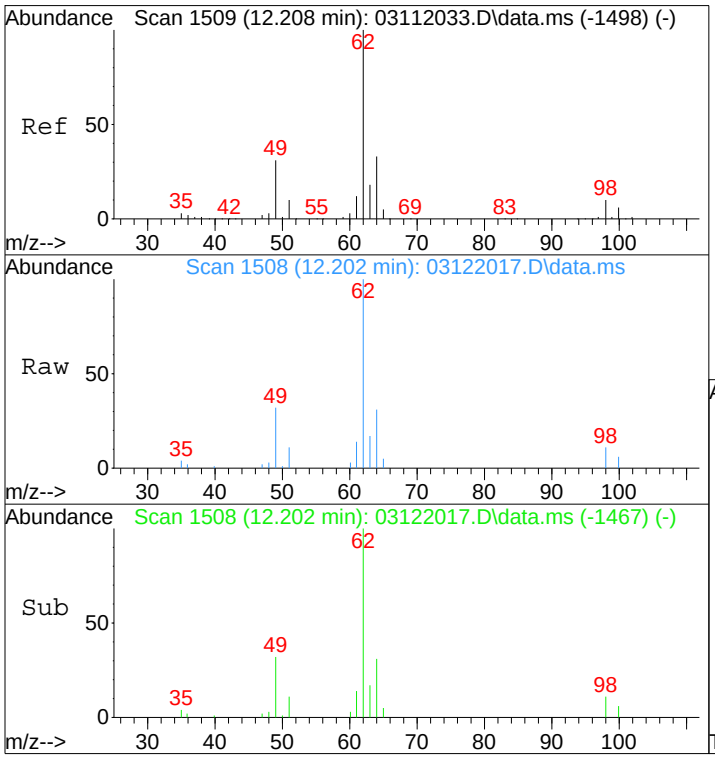


#32
Chloroform
Concen: 0.46 ng
RT: 11.40 min Scan# 1367
Delta R.T. -0.023 min
Lab File: 03122017.D
Acq: 12 Mar 2020 10:52

Tgt Ion: 83 Resp: 11422

Ion	Ratio	Lower	Upper
83	100		
85	63.2	45.5	85.5

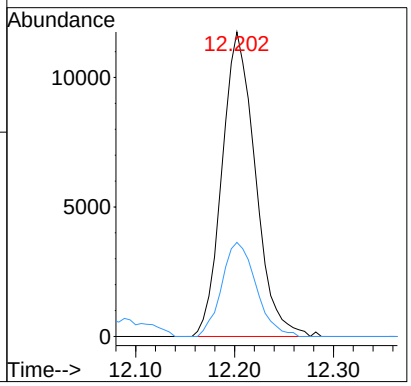


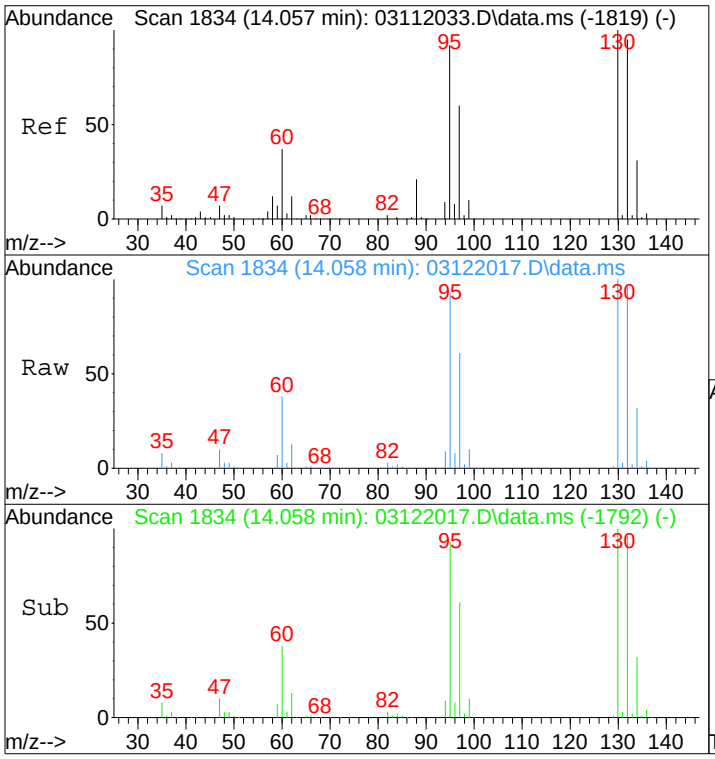


#36
1,2-Dichloroethane
Concen: 1.55 ng
RT: 12.20 min Scan# 1508
Delta R.T. -0.017 min
Lab File: 03122017.D
Acq: 12 Mar 2020 10:52

Tgt Ion: 62 Resp: 27578

Ion	Ratio	Lower	Upper
62	100		
64	31.8	12.6	52.6

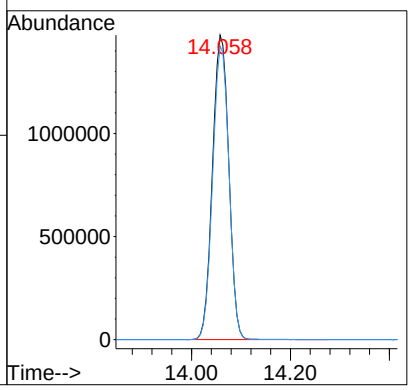


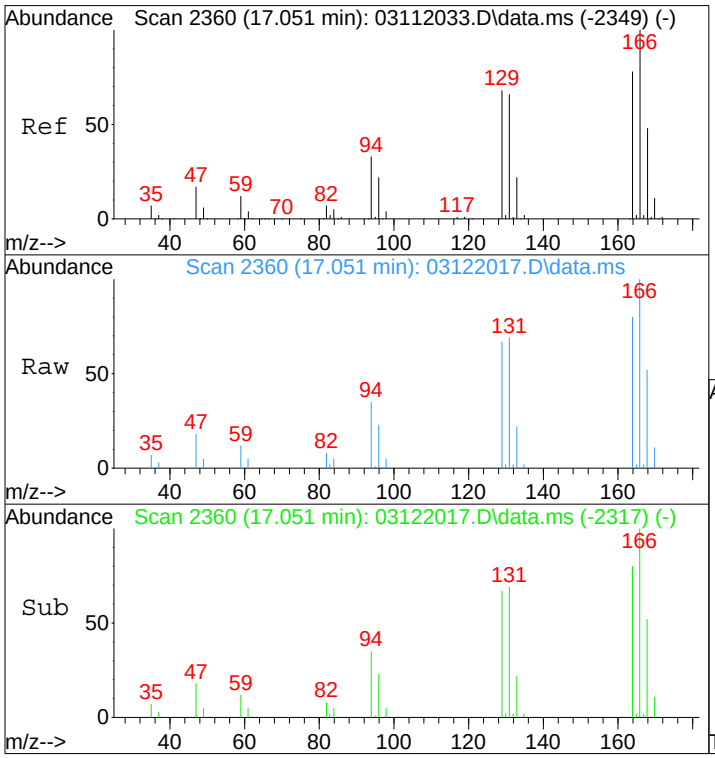


#47
Trichloroethene
Concen: 205.32 ng
RT: 14.06 min Scan# 1834
Delta R.T. -0.011 min
Lab File: 03122017.D
Acq: 12 Mar 2020 10:52

Tgt Ion:130 Resp: 3379392

Ion	Ratio	Lower	Upper
130	100		
132	96.3	75.8	115.8

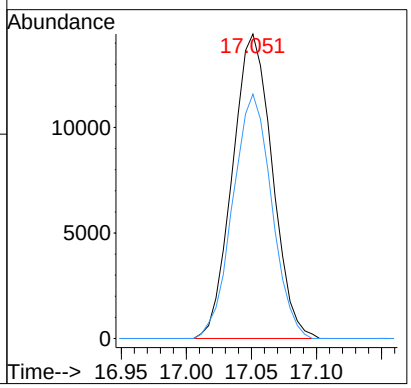




#64
Tetrachloroethene
Concen: 1.66 ng
RT: 17.05 min Scan# 2360
Delta R.T. -0.006 min
Lab File: 03122017.D
Acq: 12 Mar 2020 10:52

Tgt Ion:166 Resp: 30715

Ion	Ratio	Lower	Upper
166	100		
164	78.3	58.0	98.0



Quantitation Report (QT Reviewed)

Data File : I:\MS13\DATA\2020 03\12\03122020.D Vial: 4
Acq On : 12 Mar 2020 12:33 Operator: WA
Sample : P2001177-001dil (3.0mL) Inst : MS13
Misc : S31-01272001

Quant Time: Mar 16 13:32:41 2020
Quant Method : I:\MS13\METHODS\R13031120.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Mar 12 06:29:07 2020
Response via : Initial Calibration
DataAcq Meth:TO15.M

VOA 3/16/20

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.22	130	139744	12.500	ng	-0.03
37) 1,4-Difluorobenzene (IS2)	13.35	114	615964	12.500	ng	-0.01
56) Chlorobenzene-d5 (IS3)	17.67	82	269944	12.500	ng	0.00
System Monitoring Compounds						
33) 1,2-Dichloroethane-d4(...	12.08	65	190053	12.287	ng	-0.03
Spiked Amount 12.500	Range 70 - 130		Recovery = 98.32%			
57) Toluene-d8 (SS2)	15.80	98	683613	12.496	ng	0.00
Spiked Amount 12.500	Range 70 - 130		Recovery = 100.00%			
73) Bromofluorobenzene (SS3)	19.05	174	189842	12.221	ng	0.00
Spiked Amount 12.500	Range 70 - 130		Recovery = 97.76%			
Target Compounds						Qvalue
2) Propene	4.21	42	809	N.D.		
3) Dichlorodifluoromethan...	4.34	85	683	N.D.		
4) Chloromethane	0.00	50	0	N.D.		
5) 1,2-Dichloro-1,1,2,2-t...	0.00	135	0	N.D.		
6) Vinyl Chloride	5.03	62	16336	0.804	ng	93
7) 1,3-Butadiene	0.00	54	0	N.D.		
8) Bromomethane	0.00	94	0	N.D.		
9) Chloroethane	0.00	64	0	N.D.		
10) Ethanol	6.56	45	52	N.D.		
11) Acetonitrile	6.72	41	440	N.D.		
12) Acrolein	6.92	56	261	N.D.		
13) Acetone	7.13	58	17229	1.565	ng	100
14) Trichlorofluoromethane	7.34	101	116	N.D.		
15) 2-Propanol (Isopropanol)	7.68	45	4134	N.D.		
16) Acrylonitrile	0.00	53	0	N.D.		
17) 1,1-Dichloroethene	8.29	96	7095	0.548	ng	95
18) 2-Methyl-2-Propanol (t...	8.28	59	53	N.D.		
19) Methylene Chloride	8.50	84	315272	23.047	ng	99
20) 3-Chloro-1-propene (Al...	0.00	41	0	N.D.	d	
21) Trichlorotrifluoroethane	8.93	151	526495	44.549	ng	99
22) Carbon Disulfide	8.79	76	6252	N.D.		
23) trans-1,2-Dichloroethene	9.80	61	1409	N.D.		
24) 1,1-Dichloroethane	10.03	63	1913	N.D.		
25) Methyl tert-Butyl Ether	0.00	73	0	N.D.		
26) Vinyl Acetate	0.00	86	0	N.D.		
27) 2-Butanone (MEK)	10.61	72	662	N.D.		
28) cis-1,2-Dichloroethene	11.04	61	474362	26.619	ng	99
29) Diisopropyl Ether	0.00	87	0	N.D.		
30) Ethyl Acetate	11.38	61	111	N.D.		
31) n-Hexane	11.34	57	266	N.D.		
32) Chloroform	11.40	83	2327	N.D.		
34) Tetrahydrofuran (THF)	11.90	72	125	N.D.		
35) Ethyl tert-Butyl Ether	0.00	87	0	N.D.		
36) 1,2-Dichloroethane	12.20	62	5758	N.D.		
38) 1,1,1-Trichloroethane	12.49	97	181	N.D.		
39) Isopropyl Acetate	0.00	61	0	N.D.		
40) 1-Butanol	0.00	56	0	N.D.		
41) Benzene	12.97	78	3062	N.D.		
42) Carbon Tetrachloride	13.12	117	676	N.D.		
43) Cyclohexane	13.25	84	746	N.D.		
44) tert-Amyl Methyl Ether	0.00	73	0	N.D.		
45) 1,2-Dichloropropane	0.00	63	0	N.D.		
46) Bromodichloromethane	0.00	83	0	N.D.	d	
47) Trichloroethene	14.05	130	782447	53.135	ng	99
48) 1,4-Dioxane	0.00	88	0	N.D.		
49) 2,2,4-Trimethylpentane...	14.13	57	283	N.D.		
50) Methyl Methacrylate	14.05	100	1653	N.D.		

Data File : I:\MS13\DATA\2020 03\12\03122020.D Vial: 4
Acq On : 12 Mar 2020 12:33 Operator: WA
Sample : P2001177-001dil (3.0mL) Inst : MS13
Misc : S31-01272001

Quant Time: Mar 16 13:32:41 2020
Quant Method : I:\MS13\METHODS\R13031120.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Mar 12 06:29:07 2020
Response via : Initial Calibration
DataAcq Meth:TO15.M

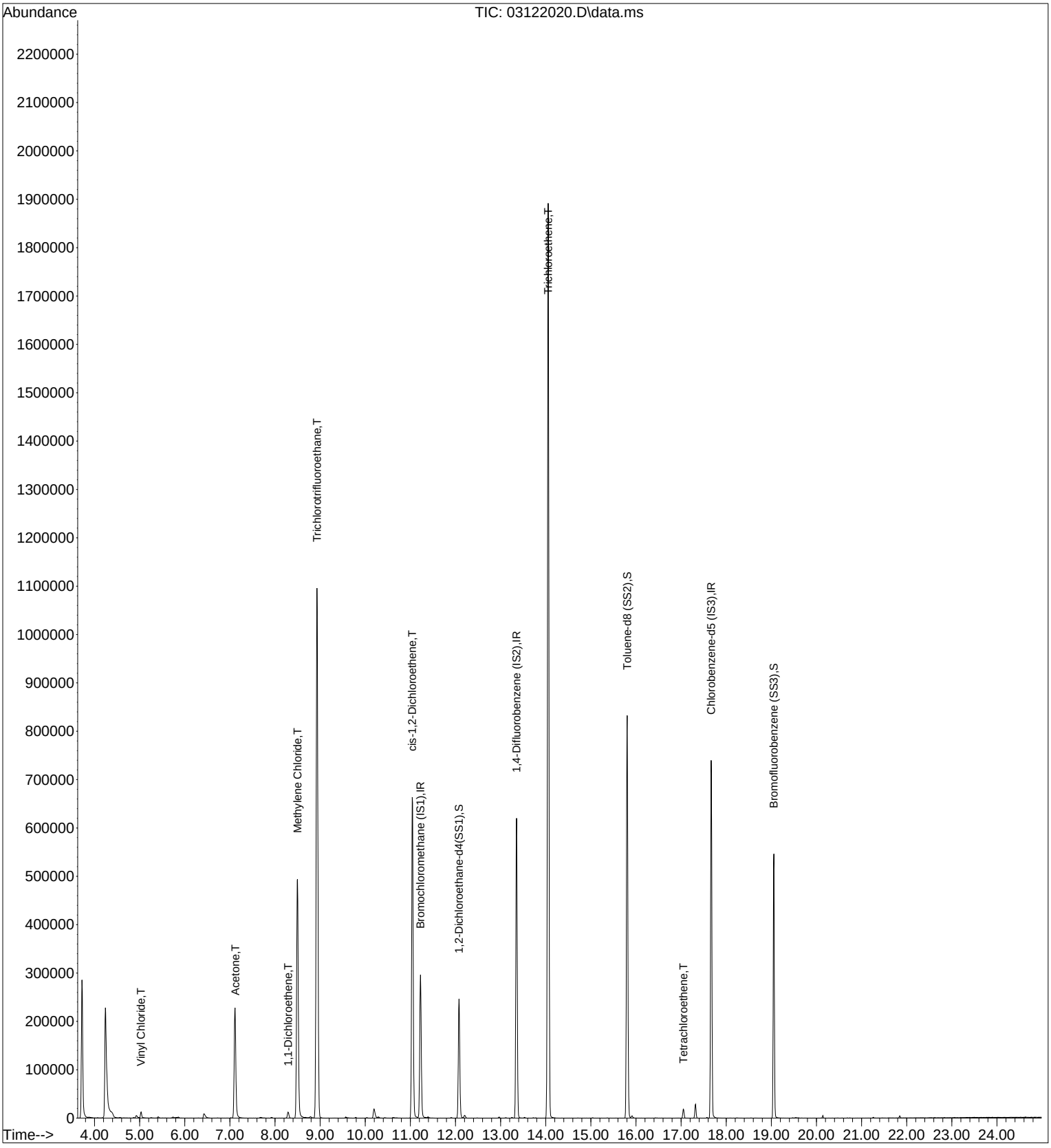
Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
51) n-Heptane	0.00	71	0	N.D.	
52) cis-1,3-Dichloropropene	0.00	75	0	N.D.	
53) 4-Methyl-2-pentanone	0.00	58	0	N.D.	
54) trans-1,3-Dichloropropene	0.00	75	0	N.D.	
55) 1,1,2-Trichloroethane	0.00	97	0	N.D.	
58) Toluene	15.91	91	4630	N.D.	
59) 2-Hexanone	0.00	43	0	N.D.	
60) Dibromochloromethane	0.00	129	0	N.D.	
61) 1,2-Dibromoethane	0.00	107	0	N.D.	
62) n-Butyl Acetate	0.00	43	0	N.D.	
63) n-Octane	0.00	57	0	N.D.	
64) Tetrachloroethene	17.05	166	7873	0.477 ng	98
65) Chlorobenzene	0.00	112	0	N.D.	
66) Ethylbenzene	18.08	91	438	N.D.	
67) m- & p-Xylenes	18.24	91	923	N.D.	
68) Bromoform	0.00	173	0	N.D.	
69) Styrene	0.00	104	0	N.D.	
70) o-Xylene	18.66	91	176	N.D.	
71) n-Nonane	0.00	43	0	N.D.	
72) 1,1,2,2-Tetrachloroethane	0.00	83	0	N.D.	
74) Cumene	0.00	105	0	N.D.	
75) alpha-Pinene	0.00	93	0	N.D.	
76) n-Propylbenzene	19.60	91	725	N.D.	
77) 3-Ethyltoluene	19.73	105	135	N.D.	
78) 4-Ethyltoluene	19.73	105	135	N.D.	
79) 1,3,5-Trimethylbenzene	19.73	105	135	N.D.	
80) alpha-Methylstyrene	0.00	118	0	N.D.	
81) 2-Ethyltoluene	20.20	105	181	N.D.	
82) 1,2,4-Trimethylbenzene	20.20	105	181	N.D.	
83) n-Decane	20.47	57	309	N.D.	
84) Benzyl Chloride	0.00	91	0	N.D.	
85) 1,3-Dichlorobenzene	0.00	146	0	N.D.	
86) 1,4-Dichlorobenzene	0.00	146	0	N.D.	
87) sec-Butylbenzene	20.20	105	181	N.D.	
88) 4-Isopropyltoluene (p-...	20.56	119	363	N.D.	
89) 1,2,3-Trimethylbenzene	0.00	105	0	N.D.	
90) 1,2-Dichlorobenzene	0.00	146	0	N.D.	
91) d-Limonene	20.68	68	243	N.D.	
92) 1,2-Dibromo-3-Chloropr...	0.00	157	0	N.D.	
93) n-Undecane	21.26	57	482	N.D.	
94) 1,2,4-Trichlorobenzene	0.00	180	0	N.D.	
95) Naphthalene	22.33	128	287	N.D.	
96) n-Dodecane	0.00	57	0	N.D.	
97) Hexachlorobutadiene	0.00	225	0	N.D.	
98) Cyclohexanone	0.00	55	0	N.D.	
99) tert-Butylbenzene	0.00	119	0	N.D.	
100) n-Butylbenzene	0.00	91	0	N.D.	

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

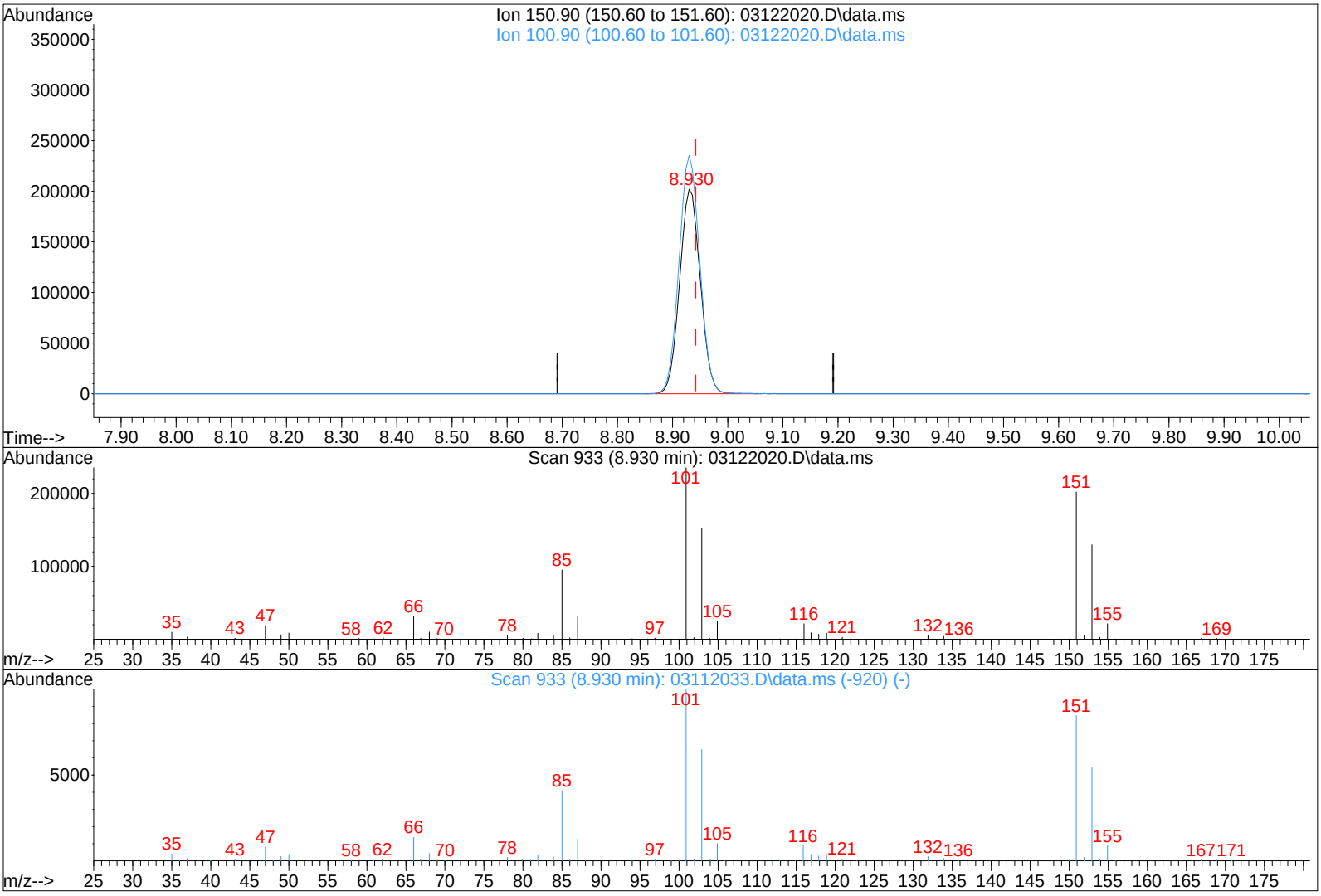
Data File : I:\MS13\DATA\2020 03\12\03122020.D Vial: 4
Acq On : 12 Mar 2020 12:33 Operator: WA
Sample : P2001177-001dil (3.0mL) Inst : MS13
Misc : S31-01272001

Quant Time: Mar 16 13:32:41 2020
Quant Method : I:\MS13\METHODS\R13031120.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Mar 12 06:29:07 2020
Response via : Initial Calibration
DataAcq Meth:TO15.M



Data File : I:\MS13\DATA\2020 03\12\03122020.D Vial: 4
Acq On : 12 Mar 2020 12:33 Operator: WA
Sample : P2001177-001dil (3.0mL) Inst : MS13
Misc : S31-01272001

Quant Time: Mar 16 13:32:41 2020
Quant Method : I:\MS13\METHODS\R13031120.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Mar 12 06:29:07 2020
Response via : Initial Calibration
DataAcq Meth:TO15.M



TIC: 03122020.D\data.ms

(21) Trichlorotrifluoroethane (T)

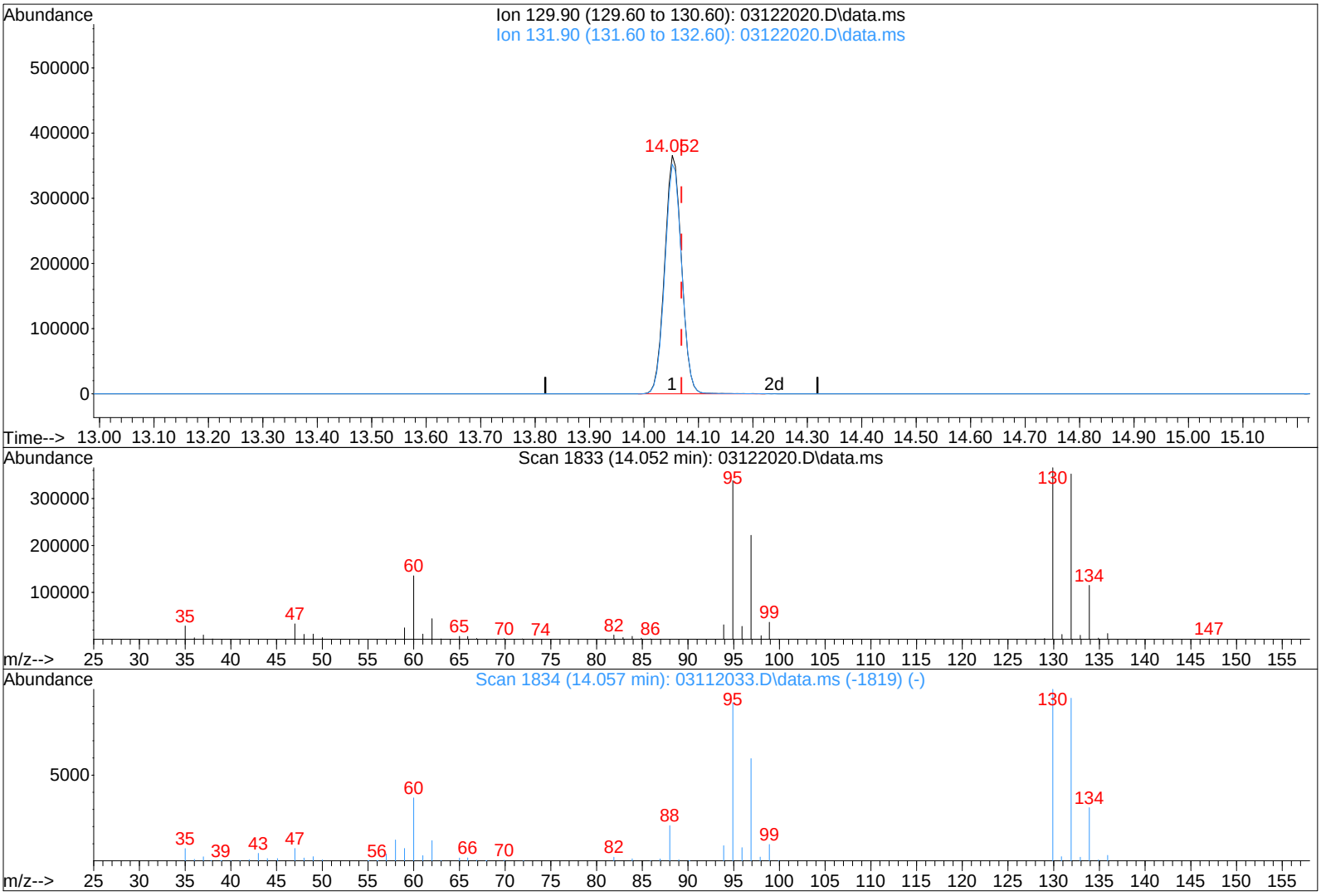
8.930min (-0.011) 44.55ng

response 526495

Ion	Exp%	Act%
150.90	100	100
100.90	117.60	116.82
0.00	0.00	0.00
0.00	0.00	0.00

Data File : I:\MS13\DATA\2020 03\12\03122020.D Vial: 4
Acq On : 12 Mar 2020 12:33 Operator: WA
Sample : P2001177-001dil (3.0mL) Inst : MS13
Misc : S31-01272001

Quant Time: Mar 16 13:32:41 2020
Quant Method : I:\MS13\METHODS\R13031120.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Mar 12 06:29:07 2020
Response via : Initial Calibration
DataAcq Meth:TO15.M



TIC: 03122020.D\data.ms

(47) Trichloroethene (T)

14.052min (-0.017) 53.13ng

response 782447

Ion	Exp%	Act%
129.90	100	100
131.90	95.80	96.51
0.00	0.00	0.00
0.00	0.00	0.00

Quantitation Report (QT Reviewed)

Data File : I:\MS13\DATA\2020 03\12\03122018.D Vial: 6
Acq On : 12 Mar 2020 11:26 Operator: WA
Sample : P2001177-002 (20mL) Inst : MS13
Misc : S31-01272001

Quant Time: Mar 16 13:30:45 2020
Quant Method : I:\MS13\METHODS\R13031120.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Mar 12 06:29:07 2020
Response via : Initial Calibration
DataAcq Meth:TO15.M

WA 3/16/20

Internal Standards	R.T.	QIon	Response	Conc	Units		Dev(Min)
1) Bromochloromethane (IS1)	11.23	130	156324	12.500	ng		-0.02
37) 1,4-Difluorobenzene (IS2)	13.36	114	675567	12.500	ng		0.00
56) Chlorobenzene-d5 (IS3)	17.67	82	296889	12.500	ng		0.00
System Monitoring Compounds							
33) 1,2-Dichloroethane-d4(...	12.08	65	210880	12.188	ng		-0.02
Spiked Amount 12.500	Range 70 - 130		Recovery = 97.52%				
57) Toluene-d8 (SS2)	15.80	98	752038	12.500	ng		0.00
Spiked Amount 12.500	Range 70 - 130		Recovery = 100.00%				
73) Bromofluorobenzene (SS3)	19.05	174	209436	12.259	ng		0.00
Spiked Amount 12.500	Range 70 - 130		Recovery = 98.08%				
Target Compounds							Qvalue
2) Propene	4.20	42	466	N.D.			
3) Dichlorodifluoromethan...	4.34	85	837	N.D.			
4) Chloromethane	0.00	50	0	N.D.			
5) 1,2-Dichloro-1,1,2,2-t...	0.00	135	0	N.D.			
6) Vinyl Chloride	5.03	62	104748	4.609	ng		100
7) 1,3-Butadiene	0.00	54	0	N.D.			
8) Bromomethane	0.00	94	0	N.D.			
9) Chloroethane	0.00	64	0	N.D.			
10) Ethanol	6.45	45	4515	N.D.			
11) Acetonitrile	0.00	41	0	N.D.			
12) Acrolein	6.95	56	54	N.D.			
13) Acetone	7.11	58	91494	7.431	ng		96
14) Trichlorofluoromethane	7.34	101	258	N.D.			
15) 2-Propanol (Isopropanol)	7.66	45	8796	N.D.			
16) Acrylonitrile	0.00	53	0	N.D.			
17) 1,1-Dichloroethene	8.29	96	47199	3.262	ng		98
18) 2-Methyl-2-Propanol (t...	8.61	59	743	N.D.			
19) Methylene Chloride	8.51	84	1931077	126.194	ng		97
20) 3-Chloro-1-propene (Al...	8.61	41	180	N.D.			
21) Trichlorotrifluoroethane	8.94	151	3270393	247.372	ng		95
22) Carbon Disulfide	8.79	76	4763	N.D.			
23) trans-1,2-Dichloroethene	9.79	61	11322	0.565	ng		97
24) 1,1-Dichloroethane	10.05	63	12705	0.485	ng		99
25) Methyl tert-Butyl Ether	0.00	73	0	N.D.			
26) Vinyl Acetate	0.00	86	0	N.D.			
27) 2-Butanone (MEK)	10.59	72	5672	0.571	ng	#	60
28) cis-1,2-Dichloroethene	11.05	61	2811058	141.014	ng		99
29) Diisopropyl Ether	11.41	87	1645	N.D.			
30) Ethyl Acetate	11.54	61	501	N.D.			
31) n-Hexane	0.00	57	0	N.D.			
32) Chloroform	11.40	83	15575	0.640	ng		98
34) Tetrahydrofuran (THF)	0.00	72	0	N.D.			
35) Ethyl tert-Butyl Ether	0.00	87	0	N.D.			
36) 1,2-Dichloroethane	12.20	62	37866	2.159	ng		99
38) 1,1,1-Trichloroethane	12.49	97	1711	N.D.			
39) Isopropyl Acetate	12.69	61	120	N.D.			
40) 1-Butanol	13.03	56	968	N.D.			
41) Benzene	12.97	78	8162	N.D.			
42) Carbon Tetrachloride	13.12	117	4862	N.D.			
43) Cyclohexane	13.26	84	4487	N.D.			
44) tert-Amyl Methyl Ether	0.00	73	0	N.D.			
45) 1,2-Dichloropropane	0.00	63	0	N.D.			
46) Bromodichloromethane	0.00	83	0	N.D. d			
47) Trichloroethene	14.06	130	4374203	270.837	ng		99
48) 1,4-Dioxane	0.00	88	0	N.D.			
49) 2,2,4-Trimethylpentane...	0.00	57	0	N.D.			
50) Methyl Methacrylate	0.00	100	0	N.D. d			

Data File : I:\MS13\DATA\2020 03\12\03122018.D Vial: 6
Acq On : 12 Mar 2020 11:26 Operator: WA
Sample : P2001177-002 (20mL) Inst : MS13
Misc : S31-01272001

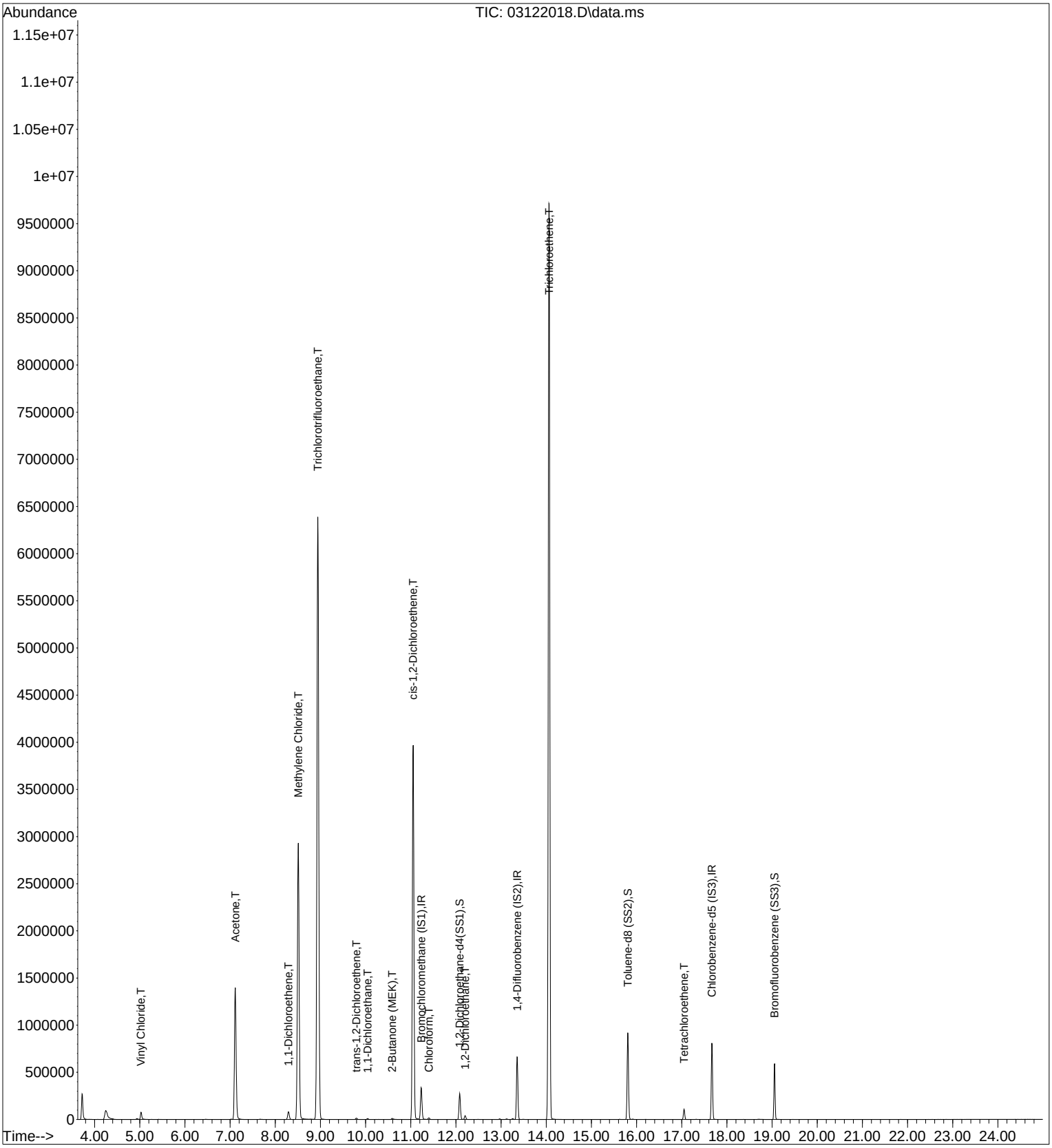
Quant Time: Mar 16 13:30:45 2020
Quant Method : I:\MS13\METHODS\R13031120.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Mar 12 06:29:07 2020
Response via : Initial Calibration
DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
51) n-Heptane	0.00	71	0	N.D.	
52) cis-1,3-Dichloropropene	0.00	75	0	N.D.	
53) 4-Methyl-2-pentanone	0.00	58	0	N.D.	
54) trans-1,3-Dichloropropene	0.00	75	0	N.D.	
55) 1,1,2-Trichloroethane	15.63	97	1421	N.D.	
58) Toluene	15.92	91	4783	N.D.	
59) 2-Hexanone	16.13	43	227	N.D.	
60) Dibromochloromethane	0.00	129	0	N.D.	
61) 1,2-Dibromoethane	0.00	107	0	N.D.	
62) n-Butyl Acetate	16.65	43	112	N.D.	
63) n-Octane	0.00	57	0	N.D.	
64) Tetrachloroethene	17.05	166	42260	2.329 ng	100
65) Chlorobenzene	0.00	112	0	N.D.	
66) Ethylbenzene	18.09	91	357	N.D.	
67) m- & p-Xylenes	18.23	91	479	N.D.	
68) Bromoform	0.00	173	0	N.D.	
69) Styrene	18.57	104	428	N.D.	
70) o-Xylene	0.00	91	0	N.D.	
71) n-Nonane	18.97	43	343	N.D.	
72) 1,1,2,2-Tetrachloroethane	0.00	83	0	N.D.	
74) Cumene	19.05	105	107	N.D.	
75) alpha-Pinene	0.00	93	0	N.D.	
76) n-Propylbenzene	0.00	91	0	N.D.	
77) 3-Ethyltoluene	19.55	105	115	N.D.	
78) 4-Ethyltoluene	0.00	105	0	N.D.	
79) 1,3,5-Trimethylbenzene	0.00	105	0	N.D.	
80) alpha-Methylstyrene	0.00	118	0	N.D.	
81) 2-Ethyltoluene	20.20	105	175	N.D.	
82) 1,2,4-Trimethylbenzene	20.20	105	175	N.D.	
83) n-Decane	0.00	57	0	N.D.	
84) Benzyl Chloride	0.00	91	0	N.D.	
85) 1,3-Dichlorobenzene	0.00	146	0	N.D.	
86) 1,4-Dichlorobenzene	0.00	146	0	N.D.	
87) sec-Butylbenzene	20.20	105	176	N.D.	
88) 4-Isopropyltoluene (p-...	0.00	119	0	N.D.	
89) 1,2,3-Trimethylbenzene	0.00	105	0	N.D.	
90) 1,2-Dichlorobenzene	0.00	146	0	N.D.	
91) d-Limonene	0.00	68	0	N.D.	
92) 1,2-Dibromo-3-Chloropr...	0.00	157	0	N.D.	
93) n-Undecane	0.00	57	0	N.D.	
94) 1,2,4-Trichlorobenzene	0.00	180	0	N.D.	
95) Naphthalene	0.00	128	0	N.D.	
96) n-Dodecane	0.00	57	0	N.D.	
97) Hexachlorobutadiene	0.00	225	0	N.D.	
98) Cyclohexanone	0.00	55	0	N.D.	
99) tert-Butylbenzene	0.00	119	0	N.D.	
100) n-Butylbenzene	0.00	91	0	N.D.	

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Data File : I:\MS13\DATA\2020 03\12\03122018.D Vial: 6
Acq On : 12 Mar 2020 11:26 Operator: WA
Sample : P2001177-002 (20mL) Inst : MS13
Misc : S31-01272001

Quant Time: Mar 16 13:30:45 2020
Quant Method : I:\MS13\METHODS\R13031120.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Mar 12 06:29:07 2020
Response via : Initial Calibration
DataAcq Meth:TO15.M



Quantitation Report (QT Reviewed)

Data File : I:\MS13\DATA\2020 03\12\03122018.D Vial: 6
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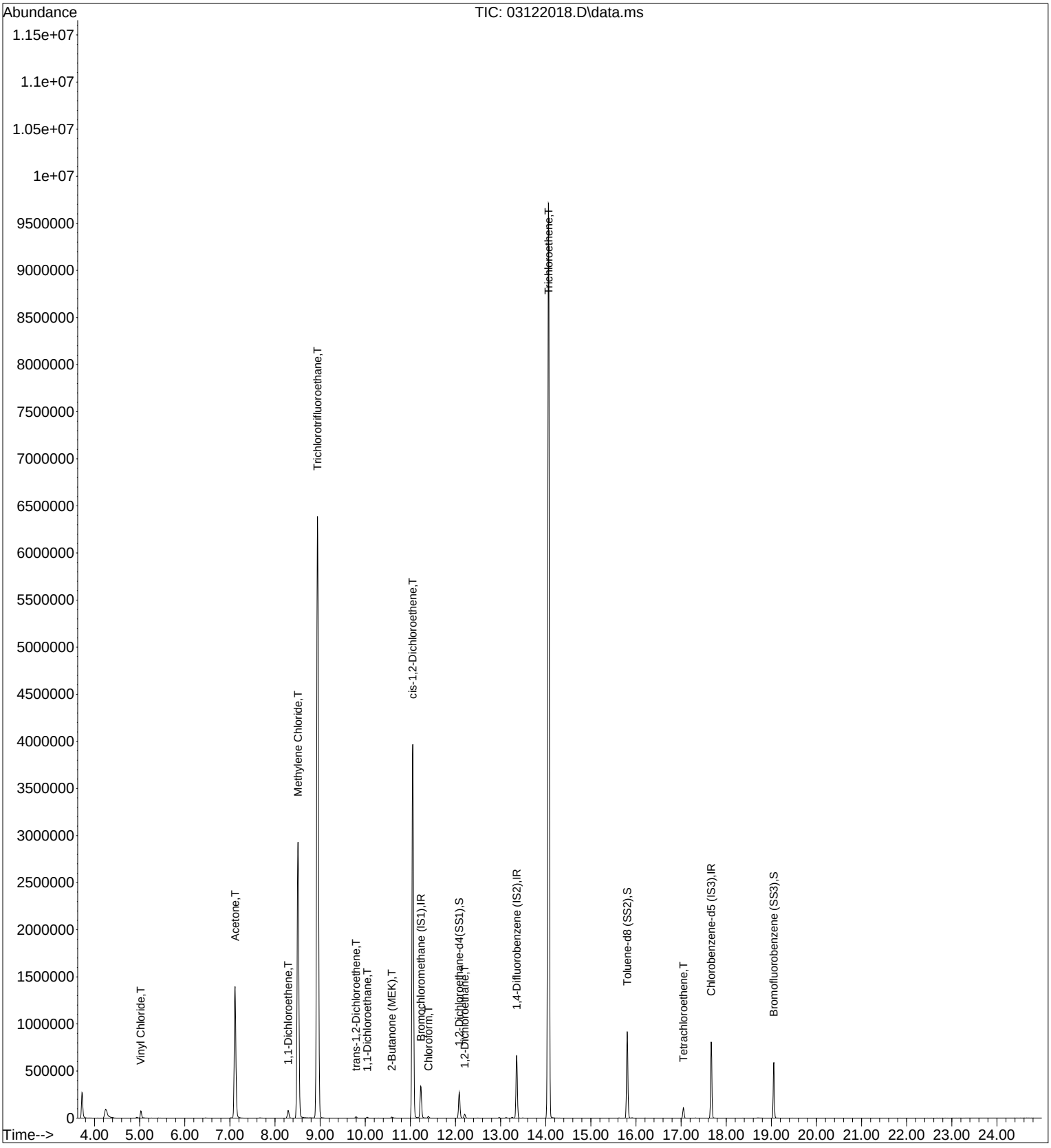
WA 3/16/20

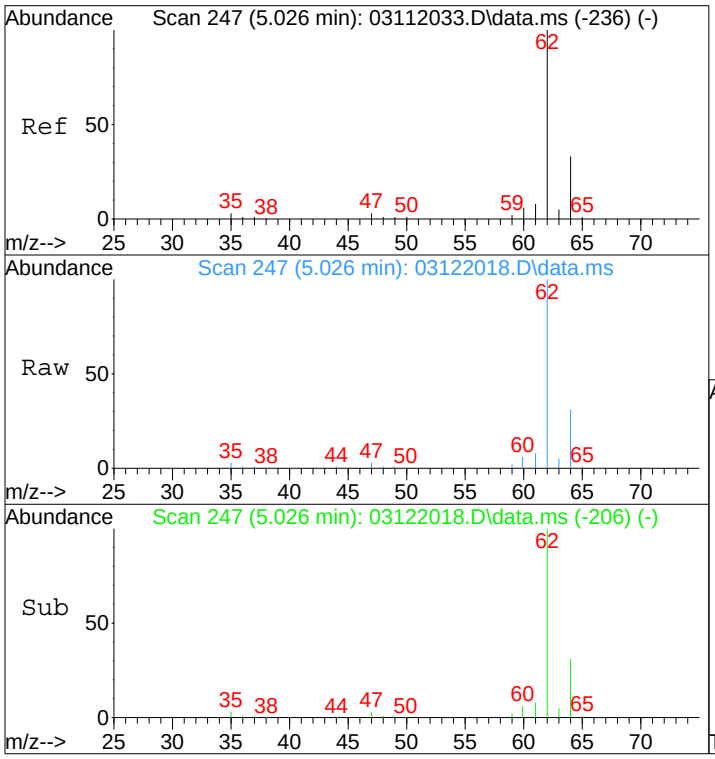
Internal Standards	R.T.	QIon	Response	Conc	Units		Dev(Min)
1) Bromochloromethane (IS1)	11.23	130	156324	12.500	ng		-0.02
37) 1,4-Difluorobenzene (IS2)	13.36	114	675567	12.500	ng		0.00
56) Chlorobenzene-d5 (IS3)	17.67	82	296889	12.500	ng		0.00
System Monitoring Compounds							
33) 1,2-Dichloroethane-d4(...	12.08	65	210880	12.188	ng		-0.02
Spiked Amount 12.500	Range 70 - 130		Recovery = 97.52%				
57) Toluene-d8 (SS2)	15.80	98	752038	12.500	ng		0.00
Spiked Amount 12.500	Range 70 - 130		Recovery = 100.00%				
73) Bromofluorobenzene (SS3)	19.05	174	209436	12.259	ng		0.00
Spiked Amount 12.500	Range 70 - 130		Recovery = 98.08%				
Target Compounds							Qvalue
6) Vinyl Chloride	5.03	62	104748	4.609	ng		100
13) Acetone	7.11	58	91494	7.431	ng		96
17) 1,1-Dichloroethene	8.29	96	47199	3.262	ng		98
19) Methylene Chloride	8.51	84	1931077	126.194	ng		97
21) Trichlorotrifluoroethane	8.94	151	3270393	247.372	ng		95
23) trans-1,2-Dichloroethene	9.79	61	11322	0.565	ng		97
24) 1,1-Dichloroethane	10.05	63	12705	0.485	ng		99
27) 2-Butanone (MEK)	10.59	72	5672	0.571	ng	#	60
28) cis-1,2-Dichloroethene	11.05	61	2811058	141.014	ng		99
32) Chloroform	11.40	83	15575	0.640	ng		98
36) 1,2-Dichloroethane	12.20	62	37866	2.159	ng		99
47) Trichloroethene	14.06	130	4374203	270.837	ng		99
64) Tetrachloroethene	17.05	166	42260	2.329	ng		100

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Data File : I:\MS13\DATA\2020 03\12\03122018.D Vial: 6
Acq On : 12 Mar 2020 11:26 Operator: WA
Sample : P2001177-002 (20mL) Inst : MS13
Misc : S31-01272001

Quant Time: Mar 16 13:30:45 2020
Quant Method : I:\MS13\METHODS\R13031120.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Mar 12 06:29:07 2020
Response via : Initial Calibration
DataAcq Meth:TO15.M

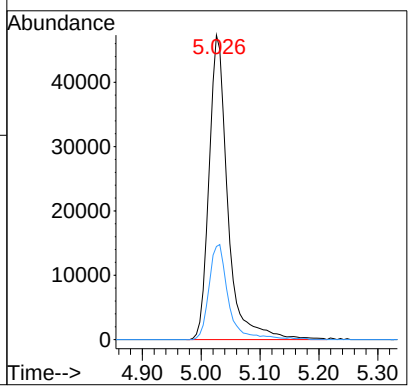


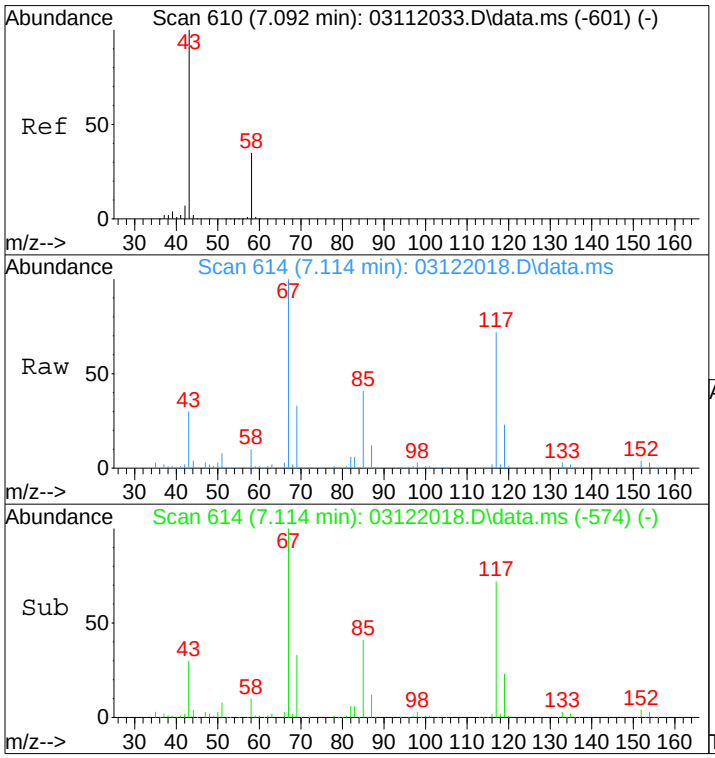


#6
Vinyl Chloride
Concen: 4.61 ng
RT: 5.03 min Scan# 247
Delta R.T. -0.017 min
Lab File: 03122018.D
Acq: 12 Mar 2020 11:26

Tgt Ion: 62 Resp: 104748

Ion	Ratio	Lower	Upper
62	100		
64	32.4	12.3	52.3

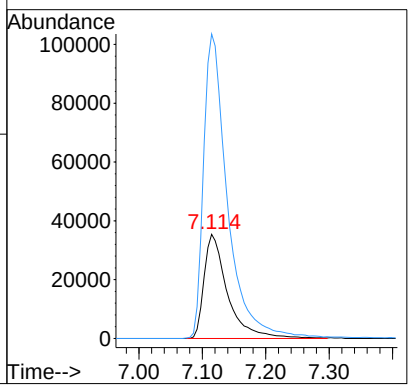


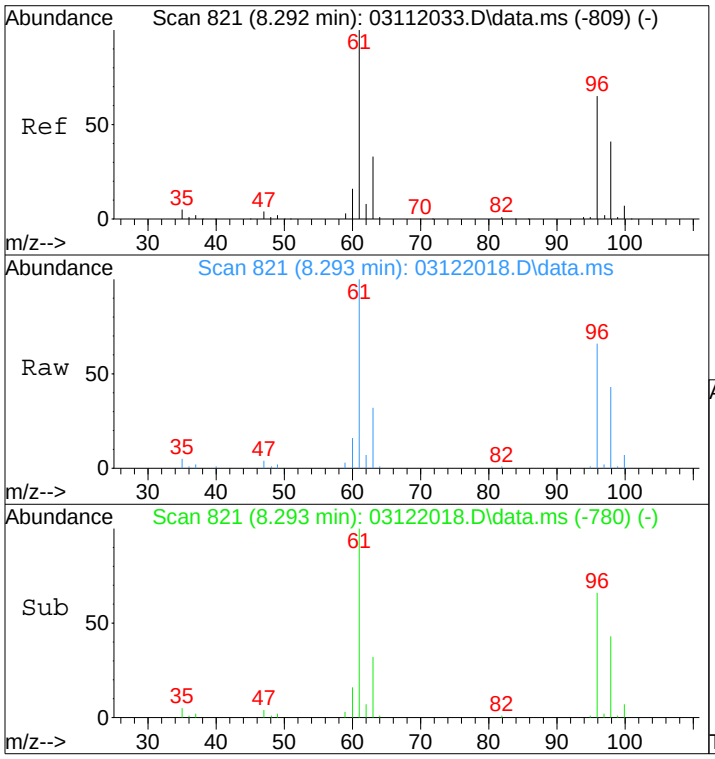


#13
Acetone
Concen: 7.43 ng
RT: 7.11 min Scan# 614
Delta R.T. -0.023 min
Lab File: 03122018.D
Acq: 12 Mar 2020 11:26

Tgt Ion: 58 Resp: 91494

Ion	Ratio	Lower	Upper
58	100		
43	298.2	260.2	320.2

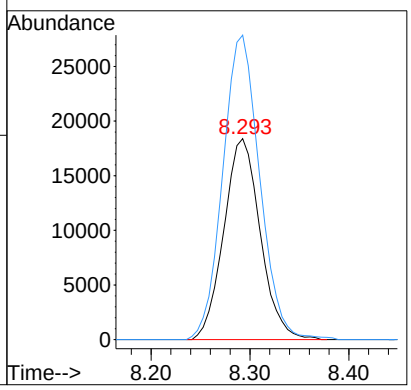


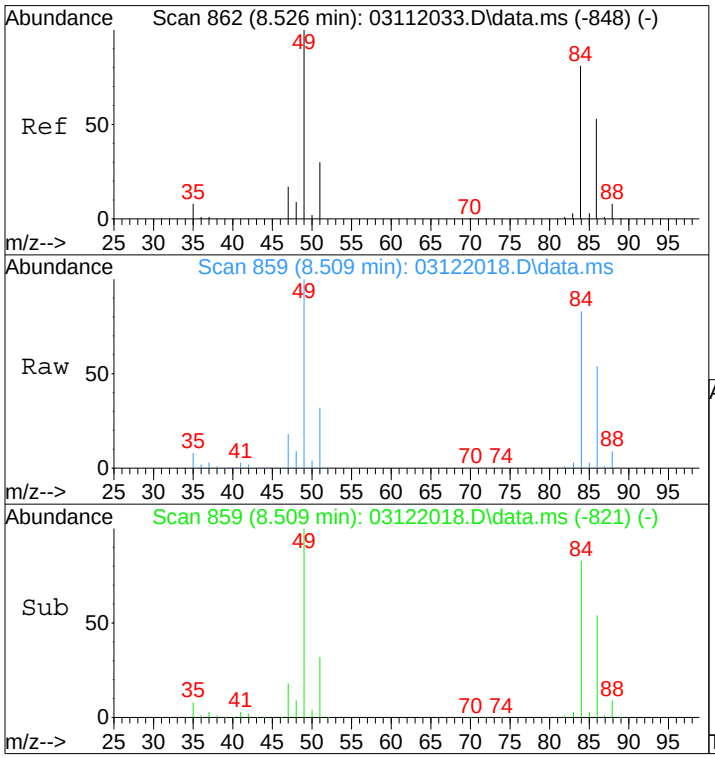


#17
1,1-Dichloroethene
Concen: 3.26 ng
RT: 8.29 min Scan# 821
Delta R.T. -0.017 min
Lab File: 03122018.D
Acq: 12 Mar 2020 11:26

Tgt Ion: 96 Resp: 47199

Ion	Ratio	Lower	Upper
96	100		
61	153.3	135.3	175.3

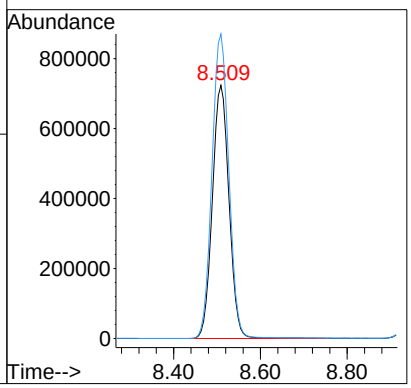


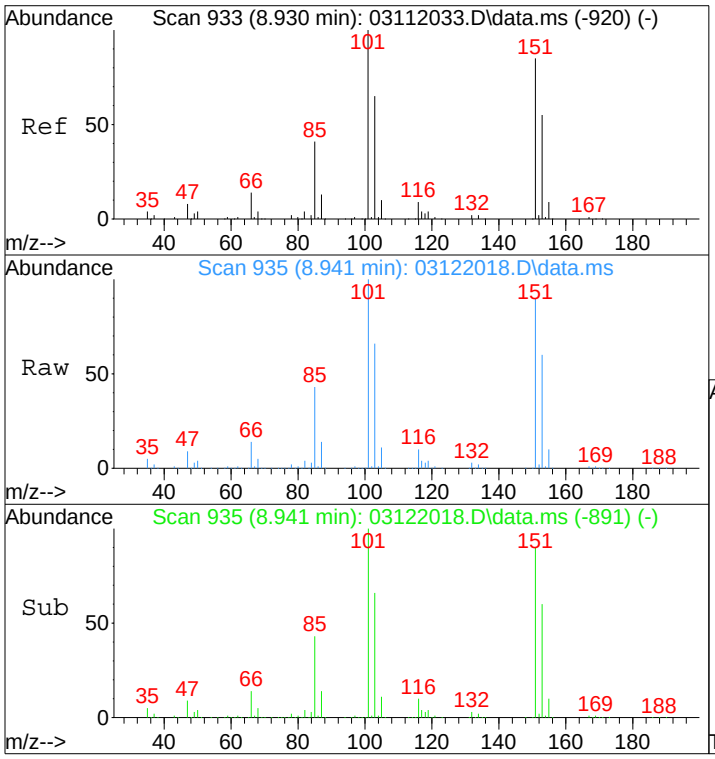


#19
Methylene Chloride
Concen: 126.19 ng
RT: 8.51 min Scan# 859
Delta R.T. -0.034 min
Lab File: 03122018.D
Acq: 12 Mar 2020 11:26

Tgt Ion: 84 Resp: 1931077

Ion	Ratio	Lower	Upper
84	100		
49	122.0	100.8	150.8

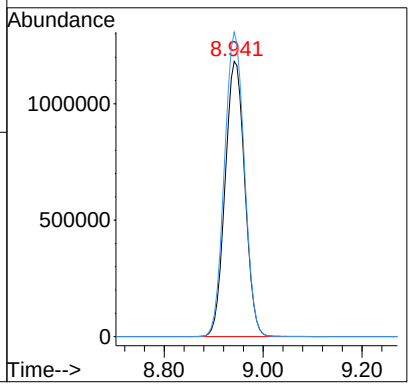


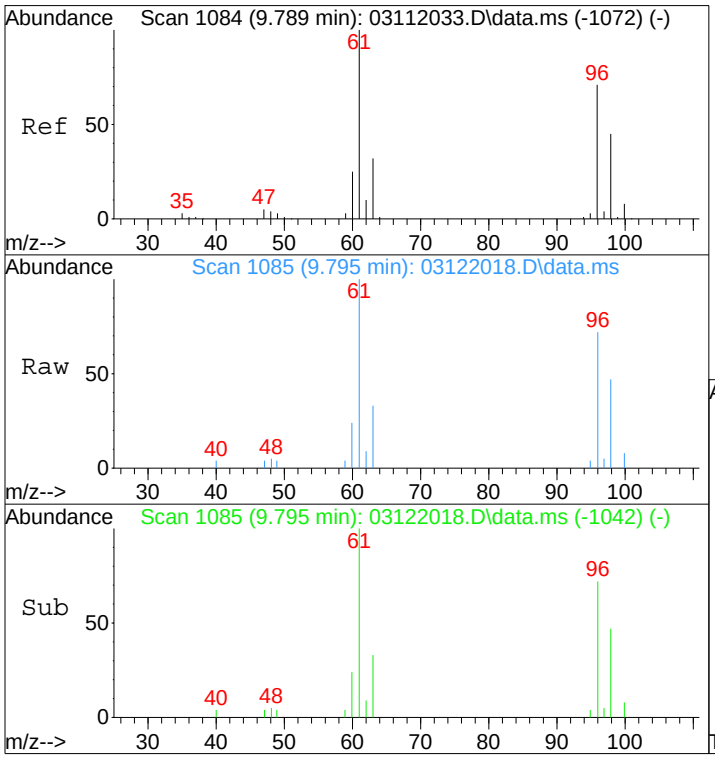


#21
Trichlorotrifluoroethane
Concen: 247.37 ng
RT: 8.94 min Scan# 935
Delta R.T. -0.000 min
Lab File: 03122018.D
Acq: 12 Mar 2020 11:26

Tgt Ion:151 Resp: 3270393

Ion	Ratio	Lower	Upper
151	100		
101	111.8	97.6	137.6

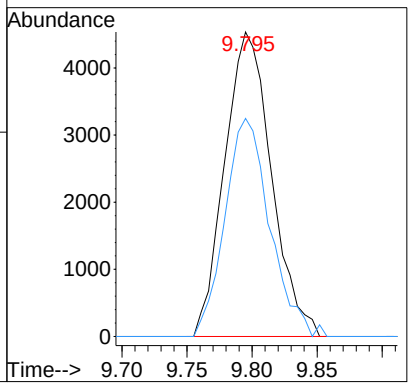


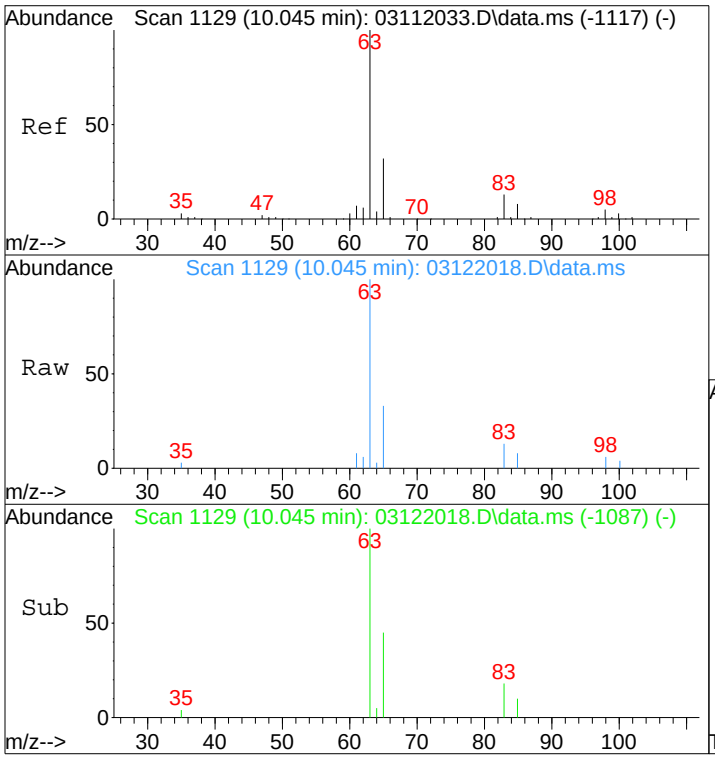


#23
trans-1,2-Dichloroethene
Concen: 0.56 ng
RT: 9.79 min Scan# 1085
Delta R.T. -0.006 min
Lab File: 03122018.D
Acq: 12 Mar 2020 11:26

Tgt Ion: 61 Resp: 11322

Ion	Ratio	Lower	Upper
61	100		
96	68.9	51.0	91.0

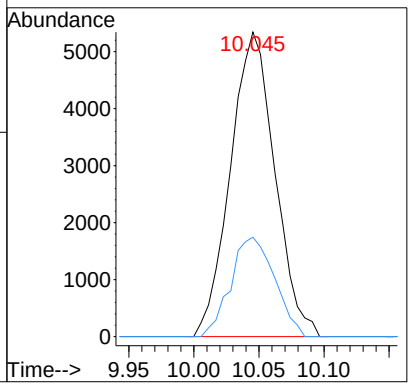


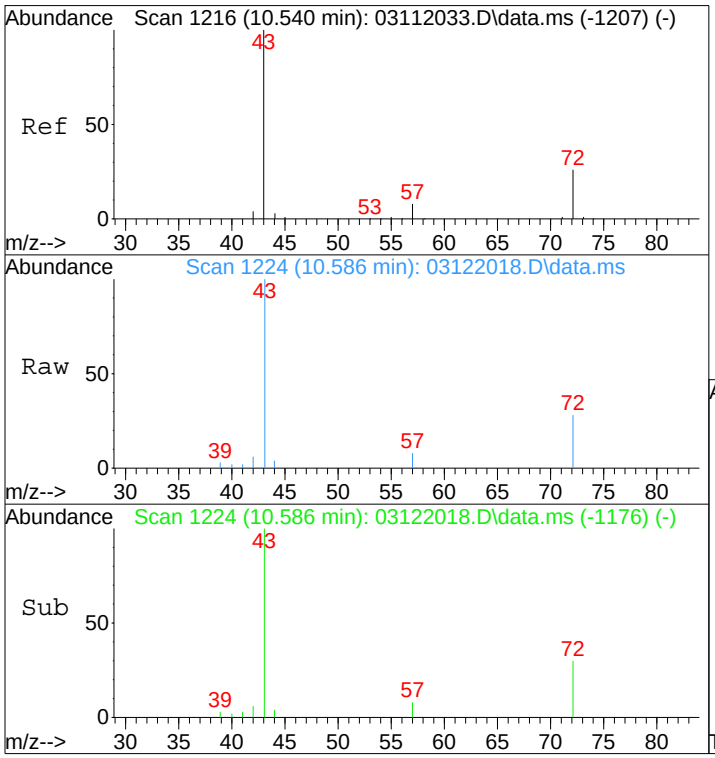


#24
1,1-Dichloroethane
Concen: 0.49 ng
RT: 10.05 min Scan# 1129
Delta R.T. -0.011 min
Lab File: 03122018.D
Acq: 12 Mar 2020 11:26

Tgt Ion: 63 Resp: 12705

Ion	Ratio	Lower	Upper
63	100		
65	32.2	11.9	51.9

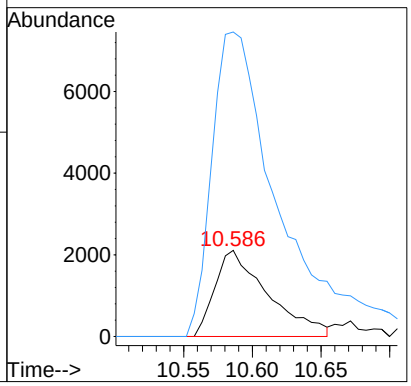


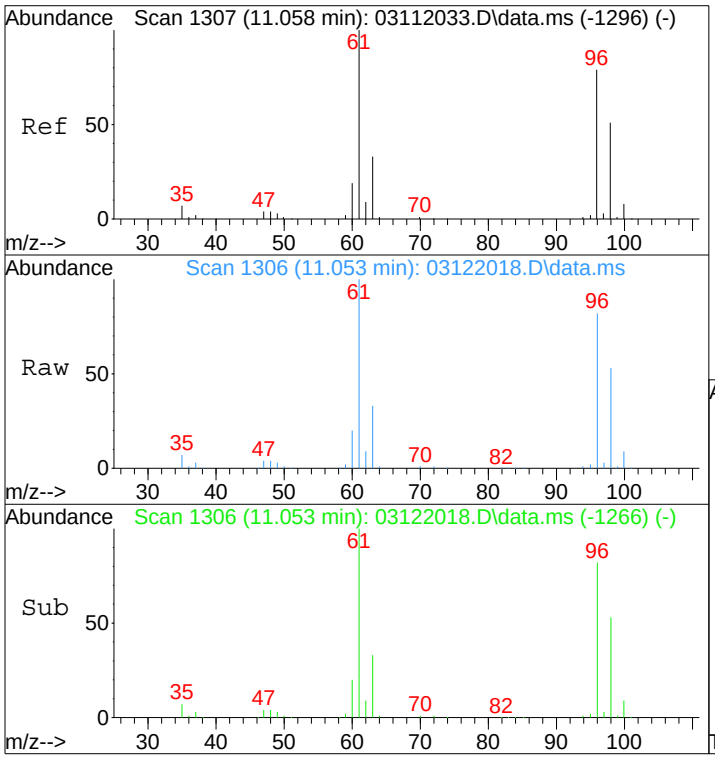


#27
2-Butanone (MEK)
Concen: 0.57 ng
RT: 10.59 min Scan# 1224
Delta R.T. 0.023 min
Lab File: 03122018.D
Acq: 12 Mar 2020 11:26

Tgt Ion: 72 Resp: 5672

Ion	Ratio	Lower	Upper
72	100		
43	471.3	360.3	400.3#

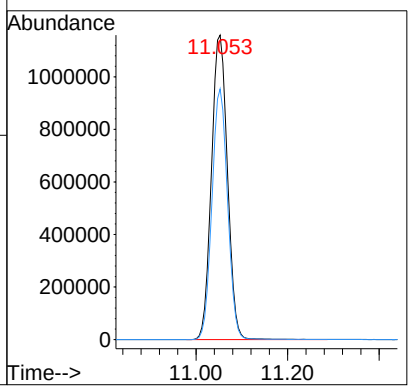


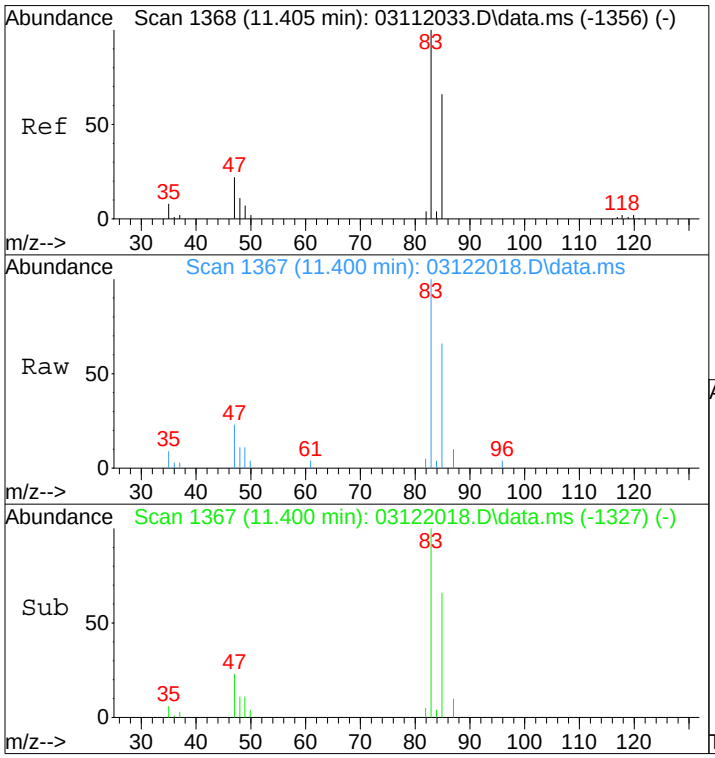


#28
cis-1,2-Dichloroethene
Concen: 141.01 ng
RT: 11.05 min Scan# 1306
Delta R.T. -0.023 min
Lab File: 03122018.D
Acq: 12 Mar 2020 11:26

Tgt Ion: 61 Resp: 2811058

Ion	Ratio	Lower	Upper
61	100		
96	80.5	59.2	99.2

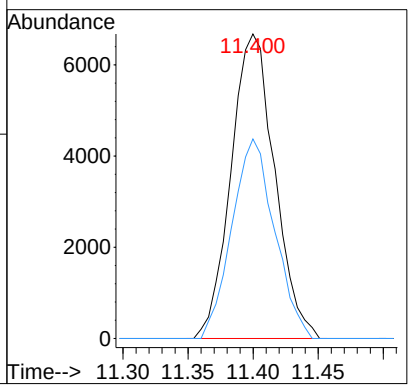


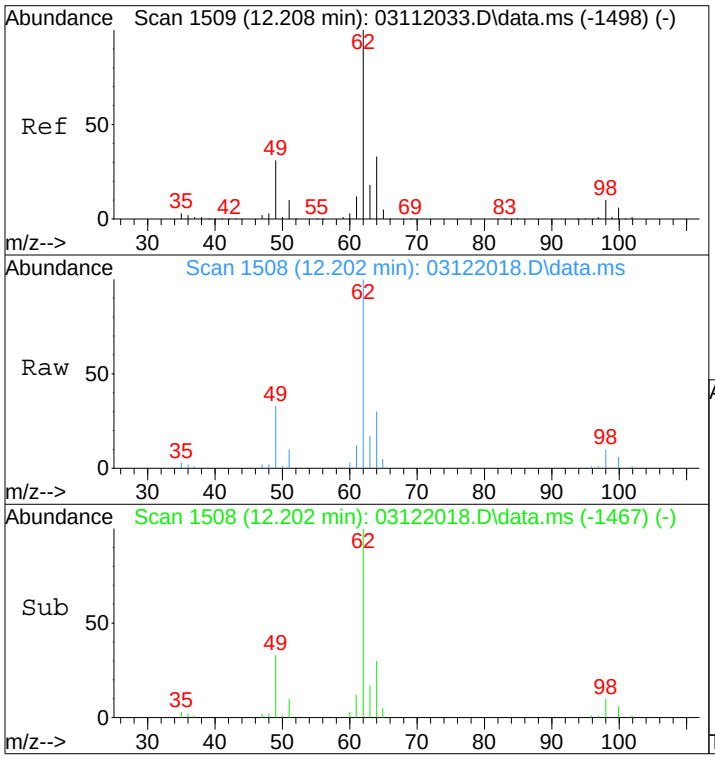


#32
Chloroform
Concen: 0.64 ng
RT: 11.40 min Scan# 1367
Delta R.T. -0.023 min
Lab File: 03122018.D
Acq: 12 Mar 2020 11:26

Tgt Ion: 83 Resp: 15575

Ion	Ratio	Lower	Upper
83	100		
85	64.1	45.5	85.5

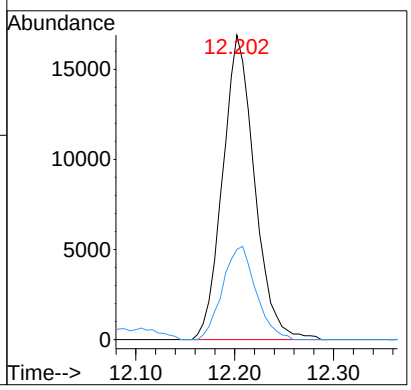


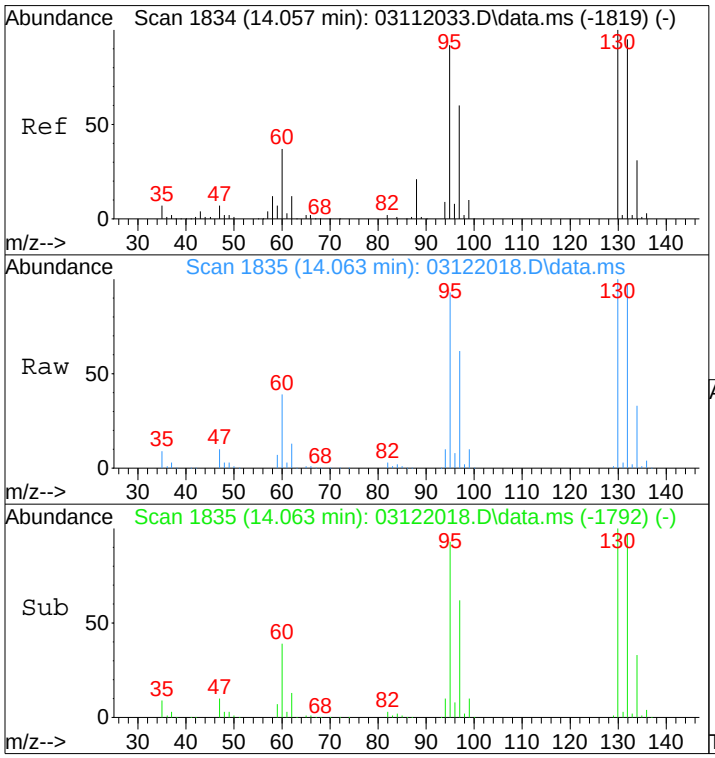


#36
1,2-Dichloroethane
Concen: 2.16 ng
RT: 12.20 min Scan# 1508
Delta R.T. -0.017 min
Lab File: 03122018.D
Acq: 12 Mar 2020 11:26

Tgt Ion: 62 Resp: 37866

Ion	Ratio	Lower	Upper
62	100		
64	32.0	12.6	52.6

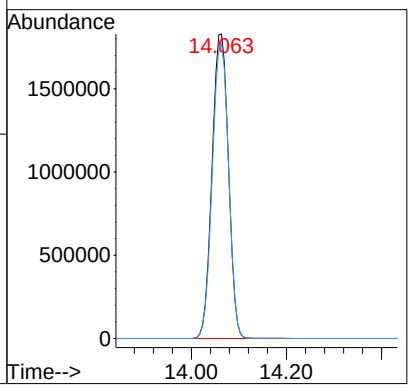


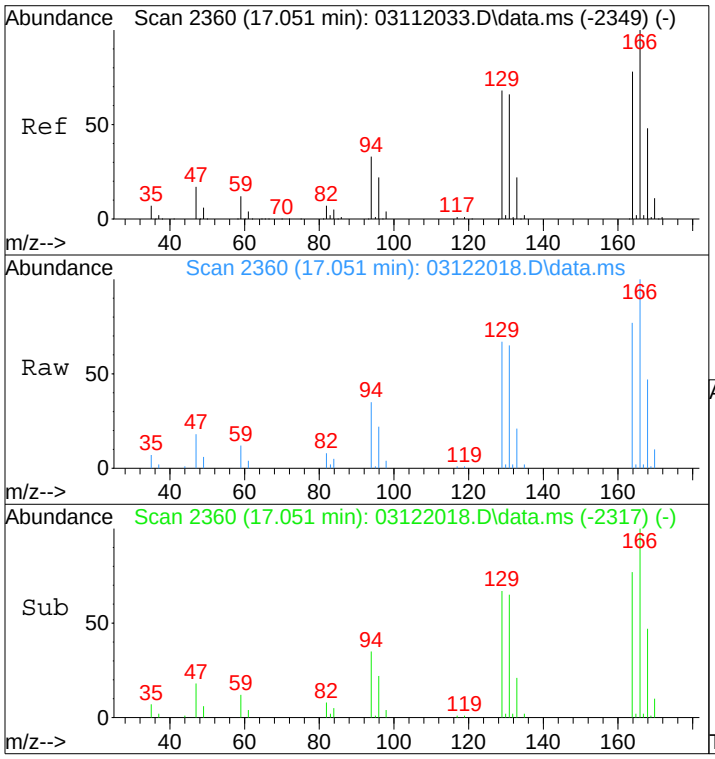


#47
Trichloroethene
Concen: 270.84 ng
RT: 14.06 min Scan# 1835
Delta R.T. -0.006 min
Lab File: 03122018.D
Acq: 12 Mar 2020 11:26

Tgt Ion:130 Resp: 4374203

Ion	Ratio	Lower	Upper
130	100		
132	96.4	75.8	115.8

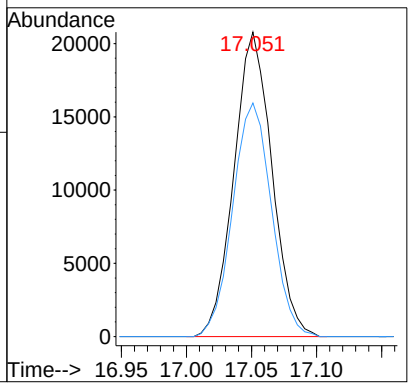




#64
Tetrachloroethene
Concen: 2.33 ng
RT: 17.05 min Scan# 2360
Delta R.T. -0.006 min
Lab File: 03122018.D
Acq: 12 Mar 2020 11:26

Tgt Ion:166 Resp: 42260

Ion	Ratio	Lower	Upper
166	100		
164	78.2	58.0	98.0



Data File : I:\MS13\DATA\2020 03\12\03122022.D Vial: 4
Acq On : 12 Mar 2020 13:39 Operator: WA
Sample : P2001177-002dil (4.0mL) Inst : MS13
Misc : S31-01272001

Quant Time: Mar 16 13:35:46 2020
Quant Method : I:\MS13\METHODS\R13031120.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Mar 12 06:29:07 2020
Response via : Initial Calibration
DataAcq Meth:TO15.M

WA 3/16/20

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.22	130	137803	12.500	ng	-0.03
37) 1,4-Difluorobenzene (IS2)	13.35	114	610367	12.500	ng	-0.01
56) Chlorobenzene-d5 (IS3)	17.67	82	268591	12.500	ng	0.00
System Monitoring Compounds						
33) 1,2-Dichloroethane-d4(...	12.08	65	189519	12.425	ng	-0.03
Spiked Amount 12.500	Range 70 - 130		Recovery = 99.44%			
57) Toluene-d8 (SS2)	15.80	98	680313	12.499	ng	0.00
Spiked Amount 12.500	Range 70 - 130		Recovery = 100.00%			
73) Bromofluorobenzene (SS3)	19.05	174	185988	12.033	ng	0.00
Spiked Amount 12.500	Range 70 - 130		Recovery = 96.24%			
Target Compounds						Qvalue
2) Propene	4.22	42	3879	N.D.		
3) Dichlorodifluoromethan...	4.22	85	1066	N.D.		
4) Chloromethane	0.00	50	0	N.D. d		
5) 1,2-Dichloro-1,1,2,2-t...	0.00	135	0	N.D.		
6) Vinyl Chloride	5.03	62	19000	0.948	ng	99
7) 1,3-Butadiene	0.00	54	0	N.D.		
8) Bromomethane	0.00	94	0	N.D.		
9) Chloroethane	0.00	64	0	N.D.		
10) Ethanol	6.47	45	1260	N.D.		
11) Acetonitrile	0.00	41	0	N.D.		
12) Acrolein	0.00	56	0	N.D.		
13) Acetone	7.13	58	20308	1.871	ng	97
14) Trichlorofluoromethane	7.11	101	876	N.D.		
15) 2-Propanol (Isopropanol)	7.71	45	2440	N.D.		
16) Acrylonitrile	0.00	53	0	N.D.		
17) 1,1-Dichloroethene	8.29	96	8328	0.653	ng	99
18) 2-Methyl-2-Propanol (t...	8.29	59	118	N.D.		
19) Methylene Chloride	8.50	84	364741	27.039	ng	100
20) 3-Chloro-1-propene (Al...	0.00	41	0	N.D.		
21) Trichlorotrifluoroethane	8.93	151	603177	51.756	ng	99
22) Carbon Disulfide	8.79	76	4295	N.D.		
23) trans-1,2-Dichloroethene	9.78	61	1777	N.D.		
24) 1,1-Dichloroethane	10.04	63	2190	N.D.		
25) Methyl tert-Butyl Ether	0.00	73	0	N.D.		
26) Vinyl Acetate	0.00	86	0	N.D.		
27) 2-Butanone (MEK)	10.62	72	757	N.D.		
28) cis-1,2-Dichloroethene	11.04	61	544560	30.989	ng	99
29) Diisopropyl Ether	0.00	87	0	N.D.		
30) Ethyl Acetate	11.29	61	672	N.D.		
31) n-Hexane	11.35	57	234	N.D.		
32) Chloroform	11.40	83	2771	N.D.		
34) Tetrahydrofuran (THF)	0.00	72	0	N.D.		
35) Ethyl tert-Butyl Ether	0.00	87	0	N.D.		
36) 1,2-Dichloroethane	12.20	62	6684	N.D.		
38) 1,1,1-Trichloroethane	12.48	97	333	N.D.		
39) Isopropyl Acetate	0.00	61	0	N.D.		
40) 1-Butanol	0.00	56	0	N.D.		
41) Benzene	12.96	78	2492	N.D.		
42) Carbon Tetrachloride	13.12	117	809	N.D.		
43) Cyclohexane	13.25	84	815	N.D.		
44) tert-Amyl Methyl Ether	0.00	73	0	N.D.		
45) 1,2-Dichloropropane	0.00	63	0	N.D.		
46) Bromodichloromethane	0.00	83	0	N.D. d		
47) Trichloroethene	14.05	130	894693	61.314	ng	99
48) 1,4-Dioxane	0.00	88	0	N.D.		
49) 2,2,4-Trimethylpentane...	14.13	57	672	N.D.		
50) Methyl Methacrylate	14.05	100	1720	N.D.		

Data File : I:\MS13\DATA\2020 03\12\03122022.D Vial: 4
Acq On : 12 Mar 2020 13:39 Operator: WA
Sample : P2001177-002dil (4.0mL) Inst : MS13
Misc : S31-01272001

Quant Time: Mar 16 13:35:46 2020
Quant Method : I:\MS13\METHODS\R13031120.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Mar 12 06:29:07 2020
Response via : Initial Calibration
DataAcq Meth:TO15.M

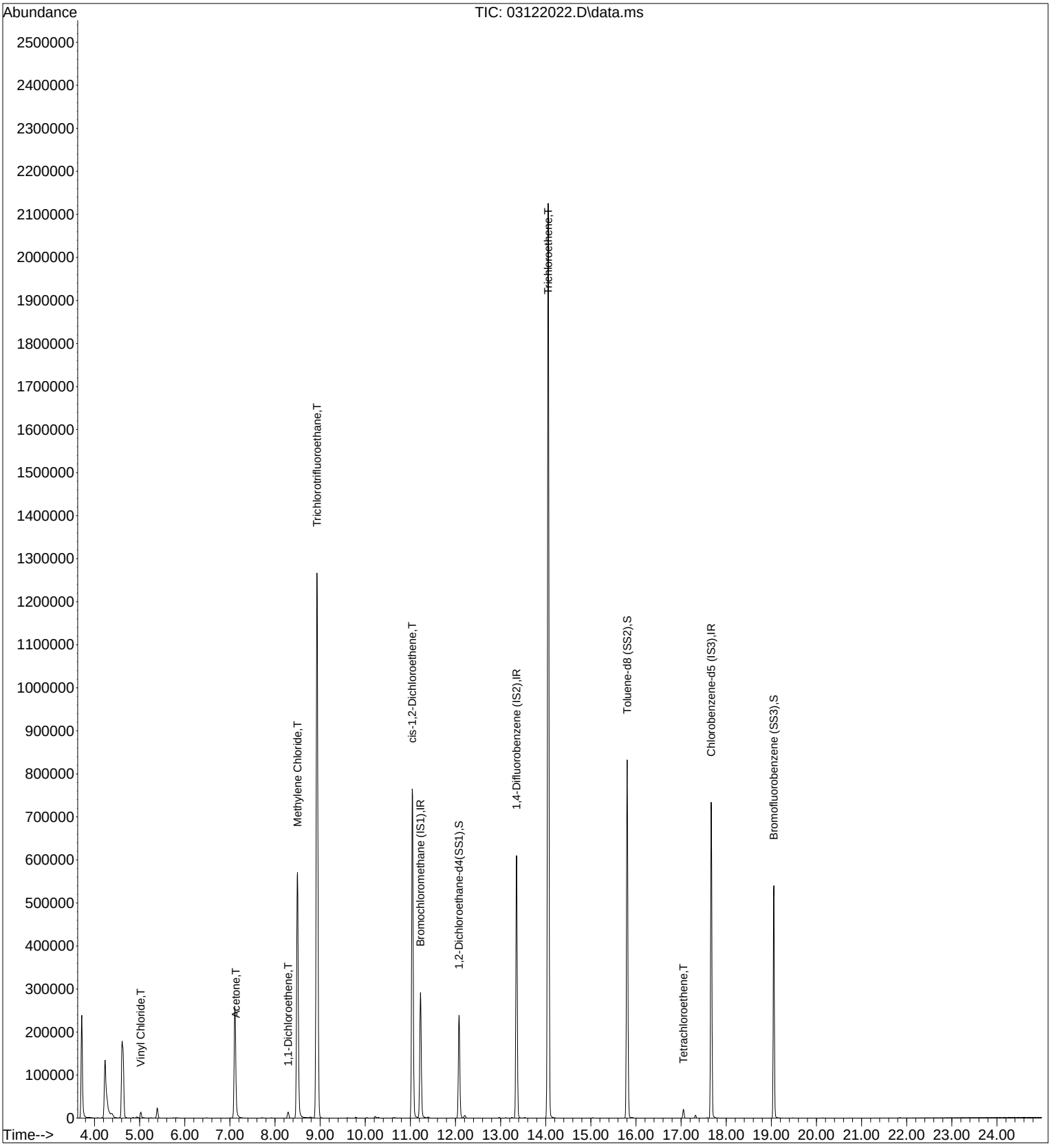
Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
51) n-Heptane	0.00	71	0	N.D.	
52) cis-1,3-Dichloropropene	0.00	75	0	N.D.	
53) 4-Methyl-2-pentanone	0.00	58	0	N.D.	
54) trans-1,3-Dichloropropene	0.00	75	0	N.D.	
55) 1,1,2-Trichloroethane	0.00	97	0	N.D.	
58) Toluene	15.91	91	1391	N.D.	
59) 2-Hexanone	0.00	43	0	N.D.	
60) Dibromochloromethane	0.00	129	0	N.D.	
61) 1,2-Dibromoethane	0.00	107	0	N.D.	
62) n-Butyl Acetate	0.00	43	0	N.D.	
63) n-Octane	0.00	57	0	N.D.	
64) Tetrachloroethene	17.05	166	8010	0.488 ng	99
65) Chlorobenzene	0.00	112	0	N.D.	
66) Ethylbenzene	0.00	91	0	N.D.	
67) m- & p-Xylenes	0.00	91	0	N.D.	
68) Bromoform	0.00	173	0	N.D.	
69) Styrene	0.00	104	0	N.D.	
70) o-Xylene	0.00	91	0	N.D.	
71) n-Nonane	0.00	43	0	N.D.	
72) 1,1,2,2-Tetrachloroethane	0.00	83	0	N.D.	
74) Cumene	0.00	105	0	N.D.	
75) alpha-Pinene	0.00	93	0	N.D.	
76) n-Propylbenzene	19.61	91	475	N.D.	
77) 3-Ethyltoluene	0.00	105	0	N.D.	
78) 4-Ethyltoluene	0.00	105	0	N.D.	
79) 1,3,5-Trimethylbenzene	0.00	105	0	N.D.	
80) alpha-Methylstyrene	0.00	118	0	N.D.	
81) 2-Ethyltoluene	20.20	105	258	N.D.	
82) 1,2,4-Trimethylbenzene	20.20	105	258	N.D.	
83) n-Decane	0.00	57	0	N.D.	
84) Benzyl Chloride	0.00	91	0	N.D.	
85) 1,3-Dichlorobenzene	0.00	146	0	N.D.	
86) 1,4-Dichlorobenzene	0.00	146	0	N.D.	
87) sec-Butylbenzene	20.20	105	258	N.D.	
88) 4-Isopropyltoluene (p-...	0.00	119	0	N.D.	
89) 1,2,3-Trimethylbenzene	0.00	105	0	N.D.	
90) 1,2-Dichlorobenzene	0.00	146	0	N.D.	
91) d-Limonene	0.00	68	0	N.D.	
92) 1,2-Dibromo-3-Chloropr...	0.00	157	0	N.D.	
93) n-Undecane	0.00	57	0	N.D.	
94) 1,2,4-Trichlorobenzene	0.00	180	0	N.D.	
95) Naphthalene	0.00	128	0	N.D.	
96) n-Dodecane	0.00	57	0	N.D.	
97) Hexachlorobutadiene	0.00	225	0	N.D.	
98) Cyclohexanone	0.00	55	0	N.D.	
99) tert-Butylbenzene	0.00	119	0	N.D.	
100) n-Butylbenzene	0.00	91	0	N.D.	

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

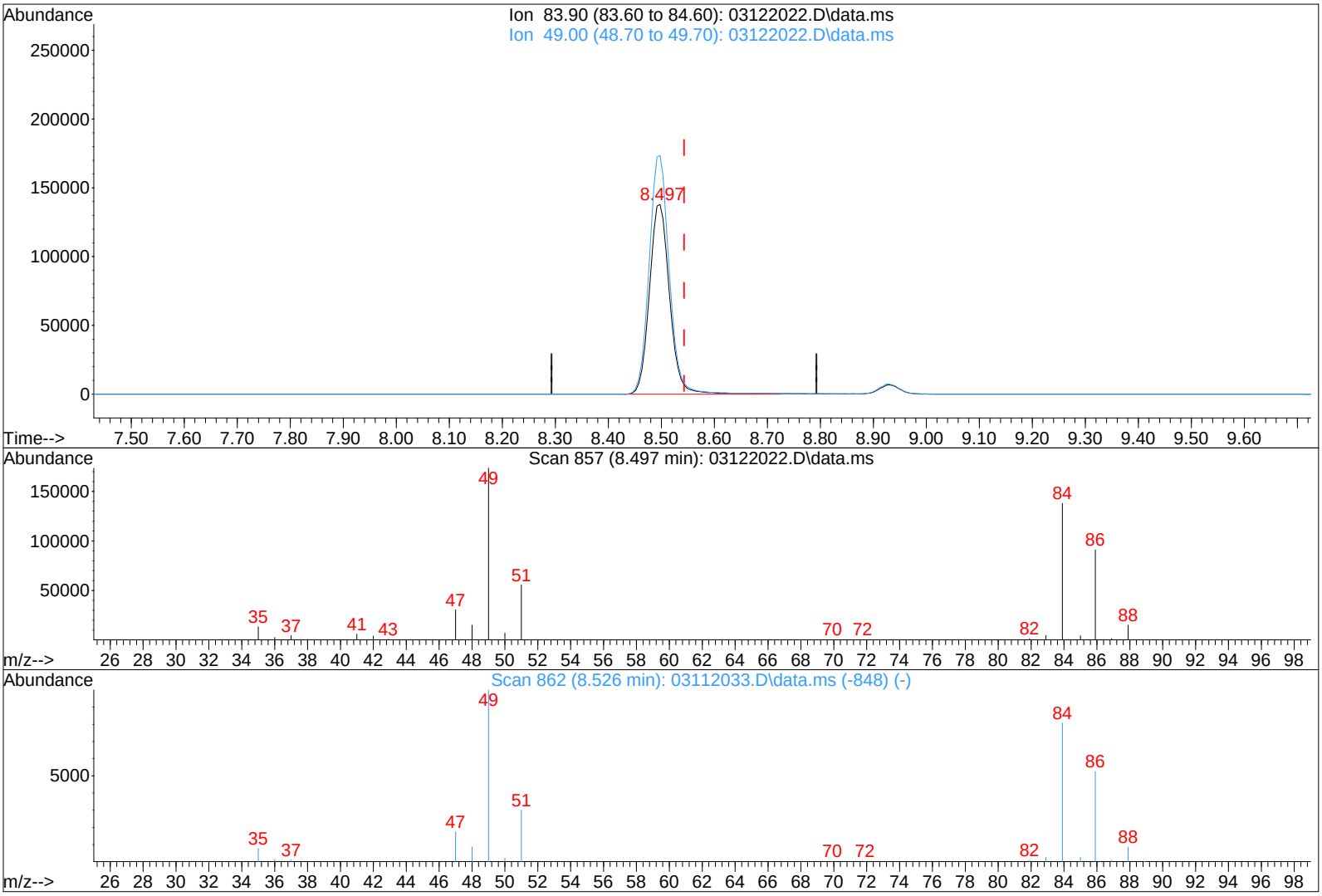
Data File : I:\MS13\DATA\2020 03\12\03122022.D Vial: 4
Acq On : 12 Mar 2020 13:39 Operator: WA
Sample : P2001177-002dil (4.0mL) Inst : MS13
Misc : S31-01272001

Quant Time: Mar 16 13:35:46 2020
Quant Method : I:\MS13\METHODS\R13031120.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Mar 12 06:29:07 2020
Response via : Initial Calibration
DataAcq Meth:TO15.M



Data File : I:\MS13\DATA\2020 03\12\03122022.D Vial: 4
Acq On : 12 Mar 2020 13:39 Operator: WA
Sample : P2001177-002dil (4.0mL) Inst : MS13
Misc : S31-01272001

Quant Time: Mar 12 14:30:02 2020
Quant Method : I:\MS13\METHODS\R13031120.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Mar 12 06:29:07 2020
Response via : Initial Calibration
DataAcq Meth:TO15.M



TIC: 03122022.D\data.ms

(19) Methylene Chloride (T)

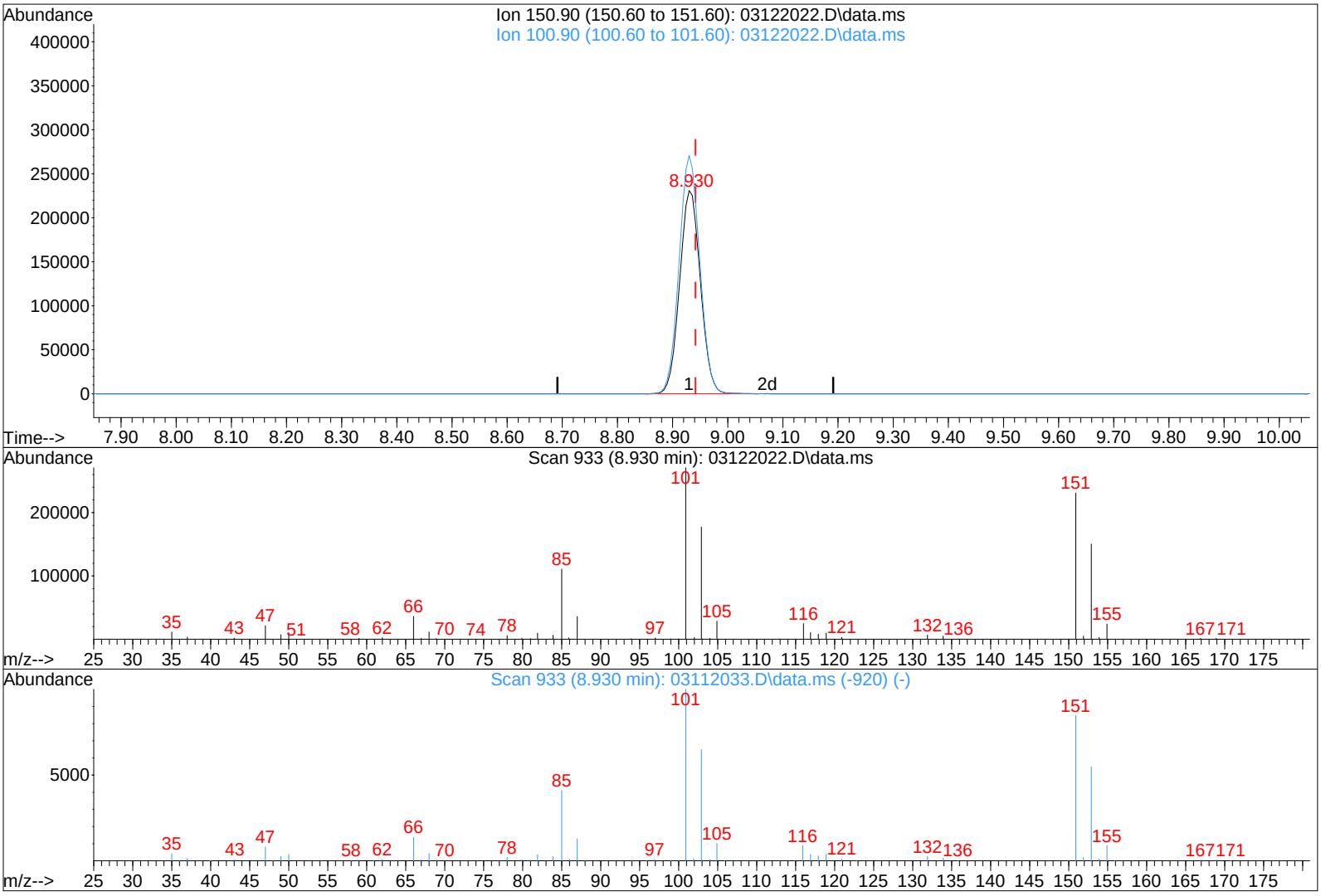
8.497min (-0.046) 27.04ng

response 364741

Ion	Exp%	Act%
83.90	100	100
49.00	125.80	125.60
0.00	0.00	0.00
0.00	0.00	0.00

Data File : I:\MS13\DATA\2020 03\12\03122022.D Vial: 4
Acq On : 12 Mar 2020 13:39 Operator: WA
Sample : P2001177-002dil (4.0mL) Inst : MS13
Misc : S31-01272001

Quant Time: Mar 12 14:30:02 2020
Quant Method : I:\MS13\METHODS\R13031120.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Mar 12 06:29:07 2020
Response via : Initial Calibration
DataAcq Meth:TO15.M



TIC: 03122022.D\data.ms

(21) Trichlorotrifluoroethane (T)

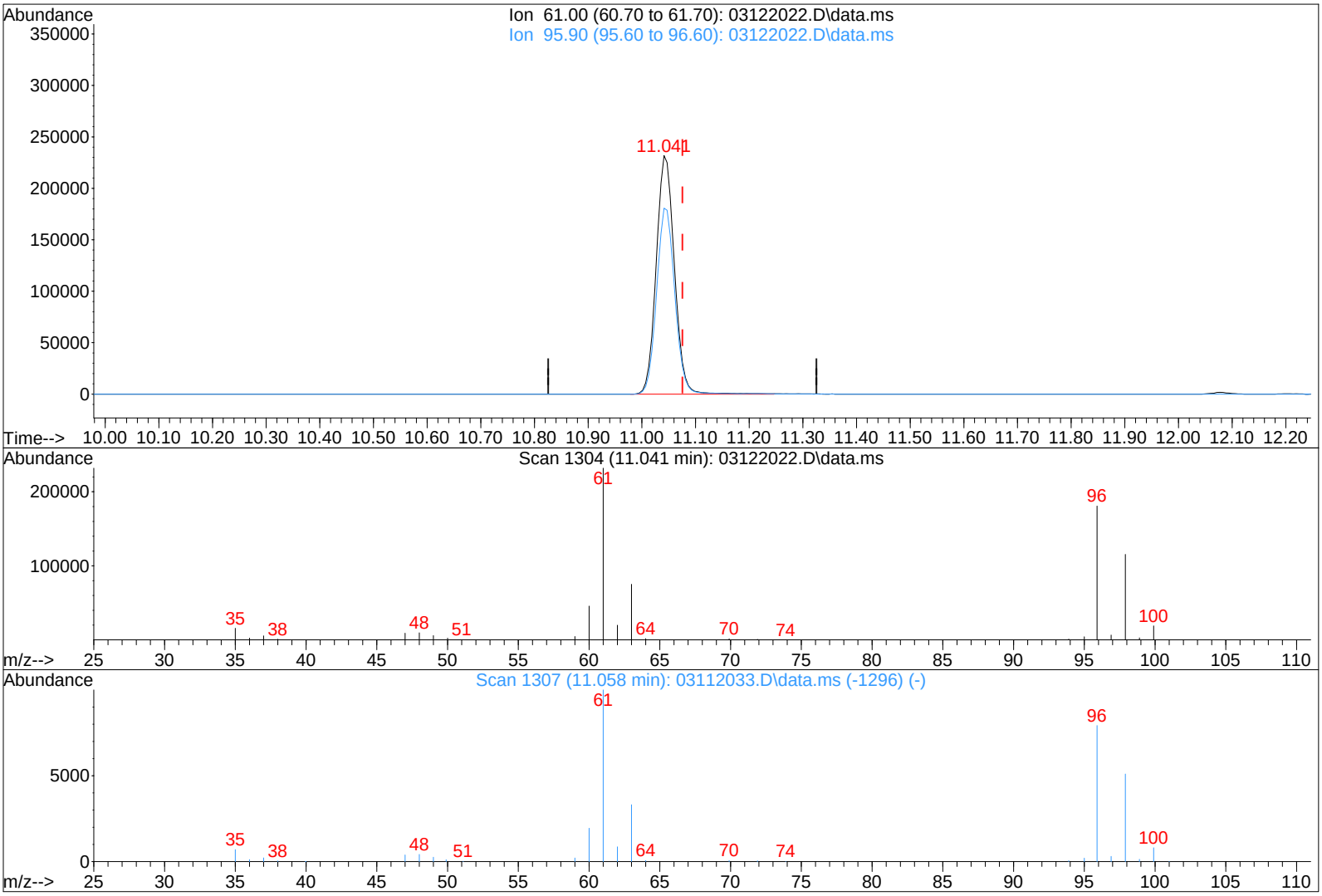
8.930min (-0.011) 51.76ng

response 603177

Ion	Exp%	Act%
150.90	100	100
100.90	117.60	116.82
0.00	0.00	0.00
0.00	0.00	0.00

Data File : I:\MS13\DATA\2020 03\12\03122022.D Vial: 4
Acq On : 12 Mar 2020 13:39 Operator: WA
Sample : P2001177-002dil (4.0mL) Inst : MS13
Misc : S31-01272001

Quant Time: Mar 12 14:30:02 2020
Quant Method : I:\MS13\METHODS\R13031120.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Mar 12 06:29:07 2020
Response via : Initial Calibration
DataAcq Meth:TO15.M



TIC: 03122022.D\data.ms

(28) cis-1,2-Dichloroethene (T)

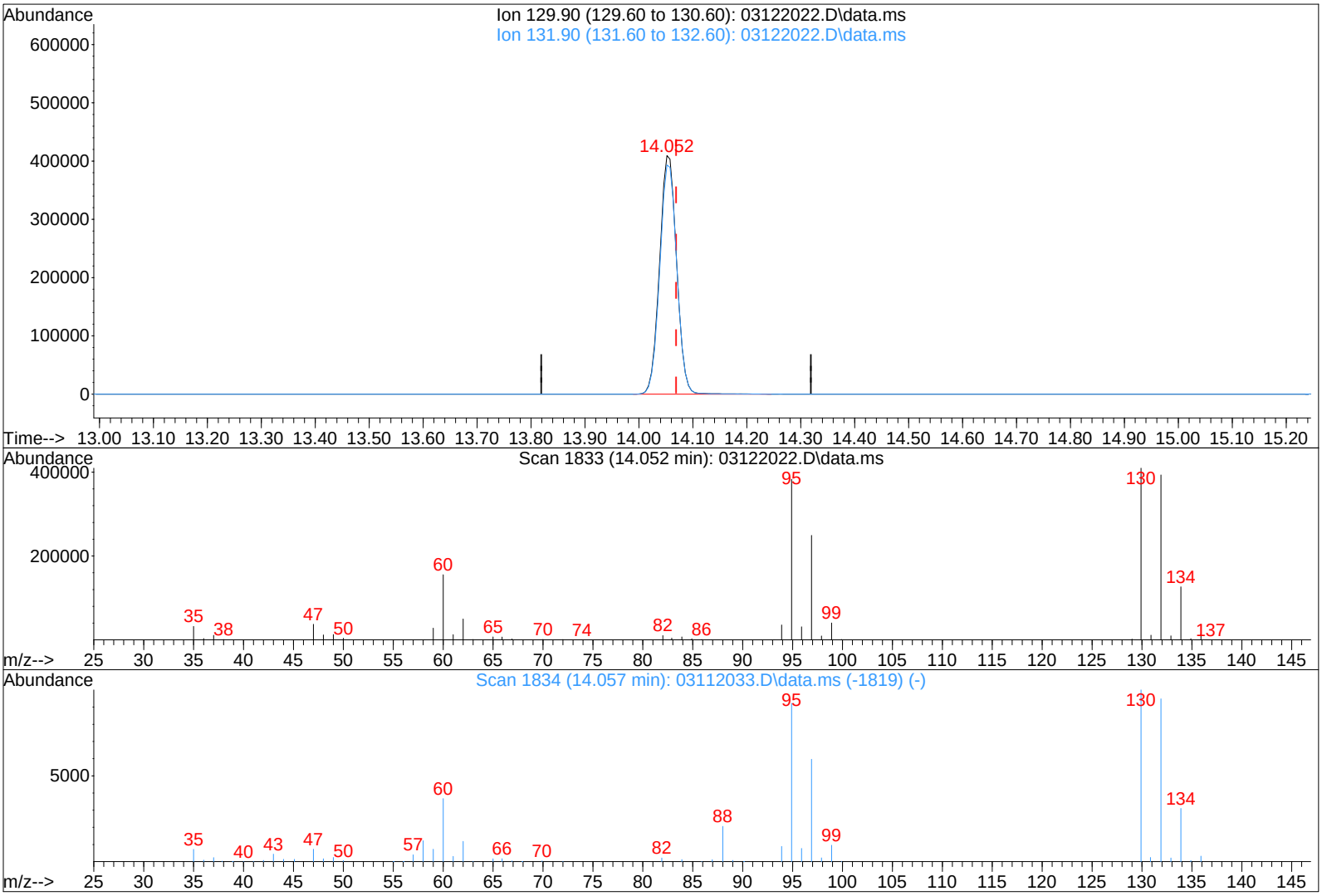
11.041min (-0.034) 30.99ng

response 544560

Ion	Exp%	Act%
61.00	100	100
95.90	79.20	78.36
0.00	0.00	0.00
0.00	0.00	0.00

Data File : I:\MS13\DATA\2020 03\12\03122022.D Vial: 4
Acq On : 12 Mar 2020 13:39 Operator: WA
Sample : P2001177-002dil (4.0mL) Inst : MS13
Misc : S31-01272001

Quant Time: Mar 12 14:30:02 2020
Quant Method : I:\MS13\METHODS\R13031120.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Mar 12 06:29:07 2020
Response via : Initial Calibration
DataAcq Meth:TO15.M



TIC: 03122022.D\data.ms

(47) Trichloroethene (T)

14.052min (-0.017) 61.31ng

response 894693

Ion	Exp%	Act%
129.90	100	100
131.90	95.80	96.37
0.00	0.00	0.00
0.00	0.00	0.00

Quantitation Report (QT Reviewed)

Data File : I:\MS13\DATA\2020 03\12\03122019.D Vial: 7
Acq On : 12 Mar 2020 12:00 Operator: WA
Sample : P2001177-003 (1000mL) Inst : MS13
Misc : S31-01272001

Quant Time: Mar 16 13:31:30 2020
Quant Method : I:\MS13\METHODS\R13031120.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Mar 12 06:29:07 2020 3/16/20
Response via : Initial Calibration
DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units		Dev(Min)
1) Bromochloromethane (IS1)	11.22	130	128578	12.500	ng		-0.03
37) 1,4-Difluorobenzene (IS2)	13.35	114	598597	12.500	ng		-0.01
56) Chlorobenzene-d5 (IS3)	17.67	82	263994	12.500	ng		0.00
System Monitoring Compounds							
33) 1,2-Dichloroethane-d4(...	12.08	65	185374	13.025	ng		-0.03
Spiked Amount 12.500	Range 70 - 130		Recovery = 104.24%				
57) Toluene-d8 (SS2)	15.80	98	668420	12.494	ng		0.00
Spiked Amount 12.500	Range 70 - 130		Recovery = 99.92%				
73) Bromofluorobenzene (SS3)	19.05	174	184247	12.128	ng		0.00
Spiked Amount 12.500	Range 70 - 130		Recovery = 97.04%				
Target Compounds							Qvalue
2) Propene	0.00	42	0	N.D.	d		
3) Dichlorodifluoromethan...	4.34	85	41115	1.760	ng		99
4) Chloromethane	4.62	50	3104	N.D.			
5) 1,2-Dichloro-1,1,2,2-t...	4.88	135	1138	N.D.			
6) Vinyl Chloride	5.03	62	926	N.D.			
7) 1,3-Butadiene	0.00	54	0	N.D.			
8) Bromomethane	0.00	94	0	N.D.			
9) Chloroethane	0.00	64	0	N.D.			
10) Ethanol	6.43	45	9647	0.960	ng		100
11) Acetonitrile	6.71	41	2407	N.D.			
12) Acrolein	6.92	56	807	N.D.			
13) Acetone	7.11	58	40022	3.952	ng	#	78
14) Trichlorofluoromethane	7.34	101	18918	0.948	ng		98
15) 2-Propanol (Isopropanol)	7.68	45	3037	N.D.			
16) Acrylonitrile	7.93	53	248	N.D.			
17) 1,1-Dichloroethene	8.29	96	369	N.D.			
18) 2-Methyl-2-Propanol (t...	8.59	59	59	N.D.			
19) Methylene Chloride	8.51	84	20364	1.618	ng		99
20) 3-Chloro-1-propene (Al...	8.60	41	129	N.D.			
21) Trichlorotrifluoroethane	8.94	151	38662	3.555	ng		100
22) Carbon Disulfide	8.78	76	10775	N.D.			
23) trans-1,2-Dichloroethene	0.00	61	0	N.D.			
24) 1,1-Dichloroethane	0.00	63	0	N.D.			
25) Methyl tert-Butyl Ether	0.00	73	0	N.D.			
26) Vinyl Acetate	10.28	86	571	N.D.			
27) 2-Butanone (MEK)	10.57	72	5163	0.632	ng	#	77
28) cis-1,2-Dichloroethene	11.05	61	25860	1.577	ng		99
29) Diisopropyl Ether	0.00	87	0	N.D.			
30) Ethyl Acetate	11.37	61	12545	2.781	ng		94
31) n-Hexane	11.34	57	12341	0.580	ng		98
32) Chloroform	11.39	83	1142	N.D.			
34) Tetrahydrofuran (THF)	11.87	72	1550	N.D.			
35) Ethyl tert-Butyl Ether	0.00	87	0	N.D.			
36) 1,2-Dichloroethane	12.21	62	962	N.D.			
38) 1,1,1-Trichloroethane	0.00	97	0	N.D.			
39) Isopropyl Acetate	0.00	61	0	N.D.			
40) 1-Butanol	13.00	56	1085	N.D.			
41) Benzene	12.96	78	18562	N.D.			
42) Carbon Tetrachloride	13.12	117	4913	N.D.			
43) Cyclohexane	13.25	84	2119	N.D.			
44) tert-Amyl Methyl Ether	0.00	73	0	N.D.			
45) 1,2-Dichloropropane	0.00	63	0	N.D.			
46) Bromodichloromethane	14.05	83	342	N.D.			
47) Trichloroethene	14.05	130	45041	3.147	ng		99
48) 1,4-Dioxane	0.00	88	0	N.D.			
49) 2,2,4-Trimethylpentane...	14.12	57	3784	N.D.			
50) Methyl Methacrylate	14.39	100	420	N.D.			

Data File : I:\MS13\DATA\2020 03\12\03122019.D Vial: 7
Acq On : 12 Mar 2020 12:00 Operator: WA
Sample : P2001177-003 (1000mL) Inst : MS13
Misc : S31-01272001

Quant Time: Mar 16 13:31:30 2020
Quant Method : I:\MS13\METHODS\R13031120.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Mar 12 06:29:07 2020
Response via : Initial Calibration
DataAcq Meth:TO15.M

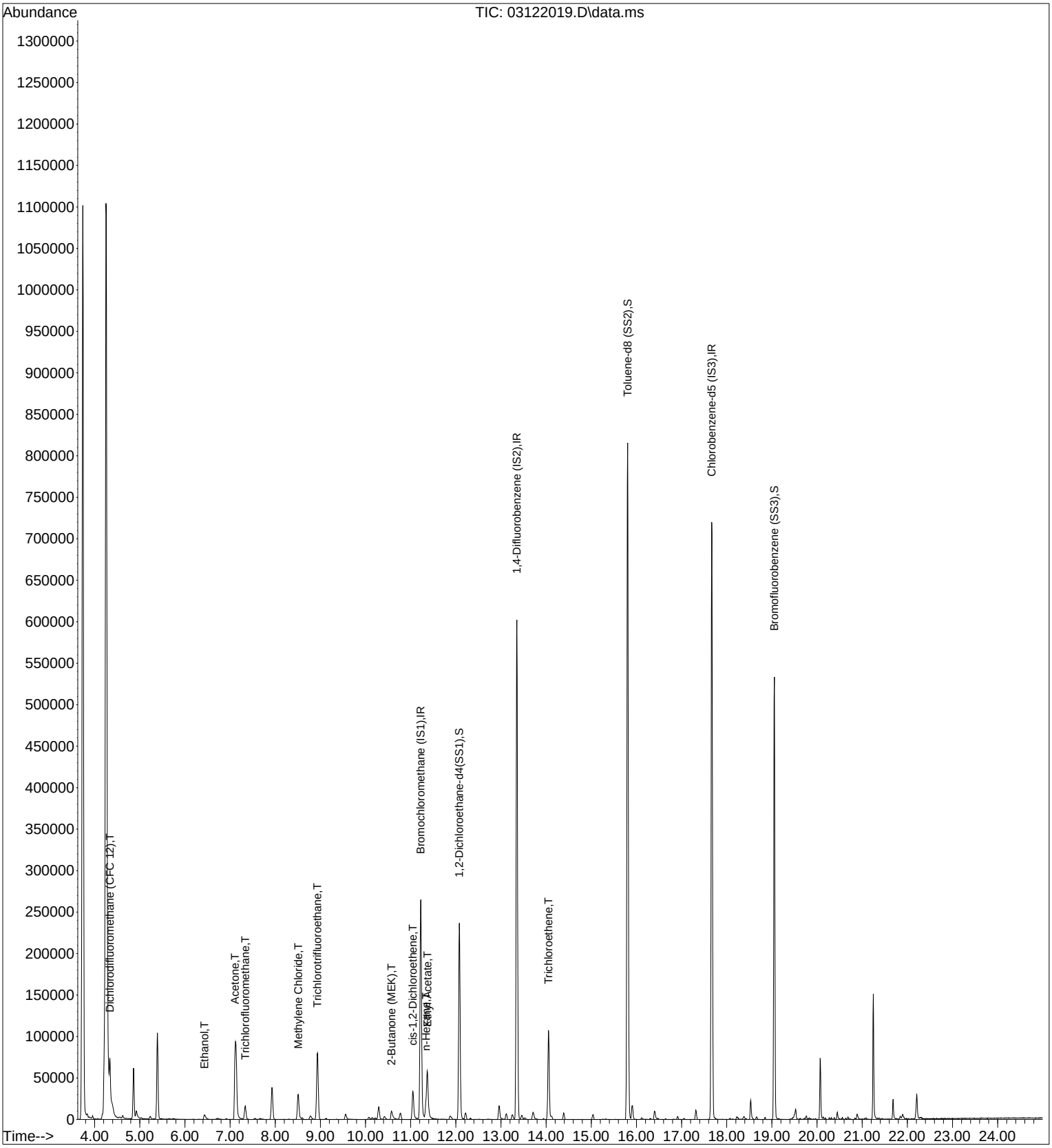
Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
51) n-Heptane	14.39	71	2028	N.D.	
52) cis-1,3-Dichloropropene	0.00	75	0	N.D.	
53) 4-Methyl-2-pentanone	0.00	58	0	N.D.	
54) trans-1,3-Dichloropropene	0.00	75	0	N.D.	
55) 1,1,2-Trichloroethane	0.00	97	0	N.D.	
58) Toluene	15.91	91	15293	N.D.	
59) 2-Hexanone	16.11	43	2111	N.D.	
60) Dibromochloromethane	0.00	129	0	N.D.	
61) 1,2-Dibromoethane	0.00	107	0	N.D.	
62) n-Butyl Acetate	16.85	43	677	N.D.	
63) n-Octane	16.91	57	754	N.D.	
64) Tetrachloroethene	17.05	166	651	N.D.	
65) Chlorobenzene	0.00	112	0	N.D.	
66) Ethylbenzene	18.07	91	1724	N.D.	
67) m- & p-Xylenes	18.22	91	3621	N.D.	
68) Bromoform	0.00	173	0	N.D.	
69) Styrene	18.57	104	694	N.D.	
70) o-Xylene	18.66	91	1374	N.D.	
71) n-Nonane	18.85	43	1328	N.D.	
72) 1,1,2,2-Tetrachloroethane	0.00	83	0	N.D.	
74) Cumene	19.19	105	109	N.D.	
75) alpha-Pinene	19.53	93	4405	N.D.	
76) n-Propylbenzene	19.63	91	586	N.D.	
77) 3-Ethyltoluene	19.73	105	960	N.D.	
78) 4-Ethyltoluene	19.77	105	615	N.D.	
79) 1,3,5-Trimethylbenzene	19.83	105	255	N.D.	
80) alpha-Methylstyrene	19.96	118	404	N.D.	
81) 2-Ethyltoluene	19.99	105	377	N.D.	
82) 1,2,4-Trimethylbenzene	20.19	105	1207	N.D.	
83) n-Decane	20.27	57	828	N.D.	
84) Benzyl Chloride	20.31	91	252	N.D.	
85) 1,3-Dichlorobenzene	20.32	146	730	N.D.	
86) 1,4-Dichlorobenzene	20.39	146	1328	N.D.	
87) sec-Butylbenzene	20.56	105	200	N.D.	
88) 4-Isopropyltoluene (p-...	20.56	119	1525	N.D.	
89) 1,2,3-Trimethylbenzene	20.56	105	200	N.D.	
90) 1,2-Dichlorobenzene	20.68	146	548	N.D.	
91) d-Limonene	20.69	68	805	N.D.	
92) 1,2-Dibromo-3-Chloropr...	0.00	157	0	N.D.	
93) n-Undecane	21.38	57	1038	N.D.	
94) 1,2,4-Trichlorobenzene	22.19	180	4275	N.D.	
95) Naphthalene	22.31	128	2200	N.D.	
96) n-Dodecane	22.29	57	547	N.D.	
97) Hexachlorobutadiene	0.00	225	0	N.D.	
98) Cyclohexanone	18.38	55	1718	N.D.	
99) tert-Butylbenzene	20.18	119	125	N.D.	
100) n-Butylbenzene	20.90	91	623	N.D.	

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data File : I:\MS13\DATA\2020 03\12\03122019.D Vial: 7
Acq On : 12 Mar 2020 12:00 Operator: WA
Sample : P2001177-003 (1000mL) Inst : MS13
Misc : S31-01272001

Quant Time: Mar 16 13:31:30 2020
Quant Method : I:\MS13\METHODS\R13031120.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Mar 12 06:29:07 2020
Response via : Initial Calibration
DataAcq Meth:TO15.M



Quantitation Report (QT Reviewed)

Data File : I:\MS13\DATA\2020 03\12\03122019.D Vial: 7
Acq On : 12 Mar 2020 12:00 Operator: WA
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DataAcq Meth:TO15.M

WA 3/16/20

Internal Standards	R.T.	QIon	Response	Conc	Units		Dev(Min)
1) Bromochloromethane (IS1)	11.22	130	128578	12.500	ng		-0.03
37) 1,4-Difluorobenzene (IS2)	13.35	114	598597	12.500	ng		-0.01
56) Chlorobenzene-d5 (IS3)	17.67	82	263994	12.500	ng		0.00
System Monitoring Compounds							
33) 1,2-Dichloroethane-d4(...	12.08	65	185374	13.025	ng		-0.03
Spiked Amount 12.500	Range 70 - 130		Recovery = 104.24%				
57) Toluene-d8 (SS2)	15.80	98	668420	12.494	ng		0.00
Spiked Amount 12.500	Range 70 - 130		Recovery = 99.92%				
73) Bromofluorobenzene (SS3)	19.05	174	184247	12.128	ng		0.00
Spiked Amount 12.500	Range 70 - 130		Recovery = 97.04%				
Target Compounds							Qvalue
3) Dichlorodifluoromethan...	4.34	85	41115	1.760	ng		99
10) Ethanol	6.43	45	9647	0.960	ng		100
13) Acetone	7.11	58	40022	3.952	ng	#	78
14) Trichlorofluoromethane	7.34	101	18918	0.948	ng		98
19) Methylene Chloride	8.51	84	20364	1.618	ng		99
21) Trichlorotrifluoroethane	8.94	151	38662	3.555	ng		100
27) 2-Butanone (MEK)	10.57	72	5163	0.632	ng	#	77
28) cis-1,2-Dichloroethene	11.05	61	25860	1.577	ng		99
30) Ethyl Acetate	11.37	61	12545	2.781	ng		94
31) n-Hexane	11.34	57	12341	0.580	ng		98
47) Trichloroethene	14.05	130	45041	3.147	ng		99

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data File : I:\MS13\DATA\2020 03\12\03122019.D Vial: 7
Acq On : 12 Mar 2020 12:00 Operator: WA
Sample : P2001177-003 (1000mL) Inst : MS13
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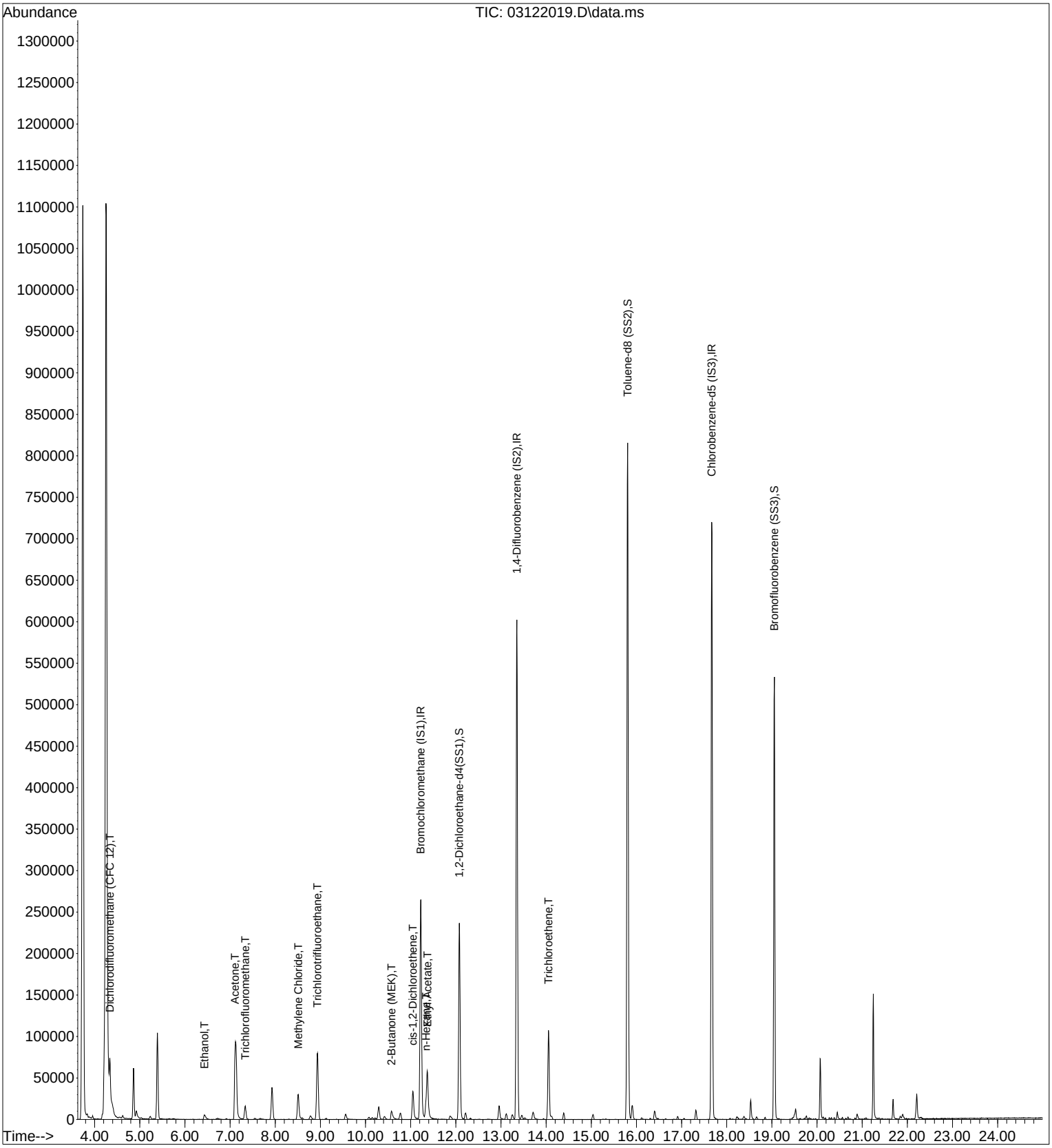
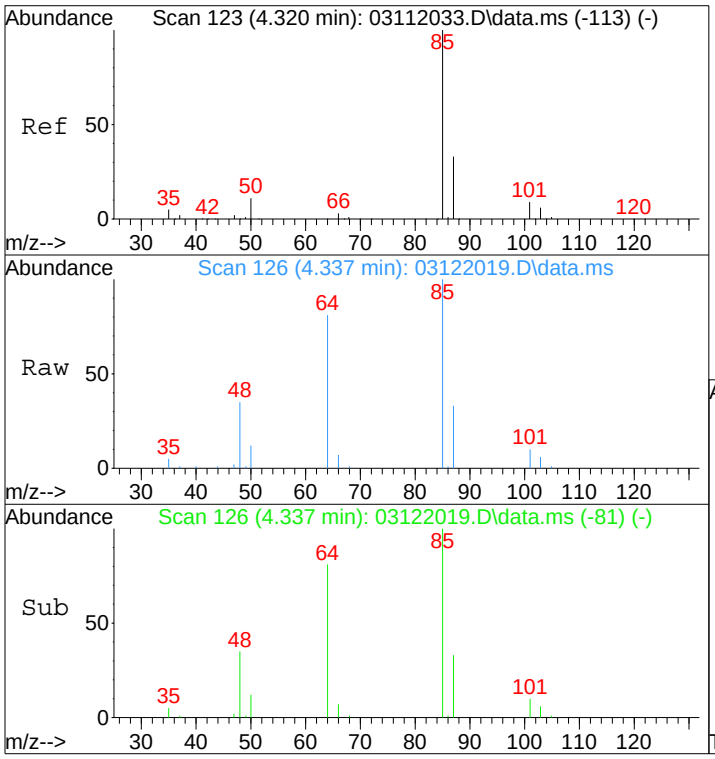
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Mar 12 06:29:07 2020
Response via : Initial Calibration
DataAcq Meth:TO15.M

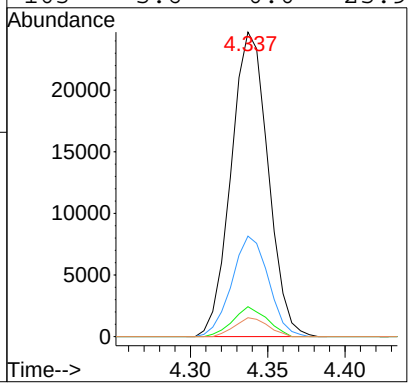


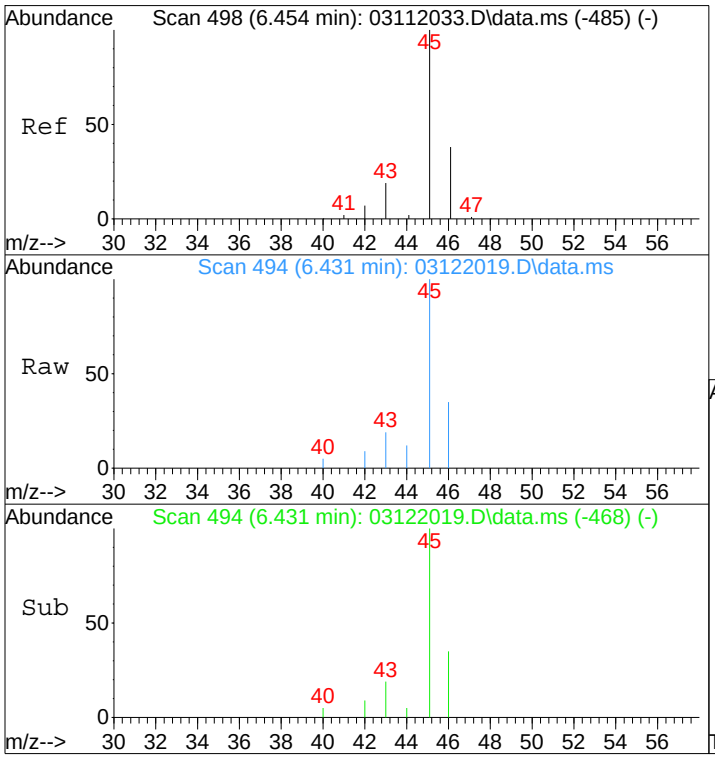


#3
Dichlorodifluoromethane (CFC 12)
Concen: 1.76 ng
RT: 4.34 min Scan# 126
Delta R.T. 0.005 min
Lab File: 03122019.D
Acq: 12 Mar 2020 12:00

Tgt Ion: 85 Resp: 41115

Ion	Ratio	Lower	Upper
85	100		
87	32.8	12.5	52.5
101	9.1	0.0	29.0
103	5.6	0.0	25.9

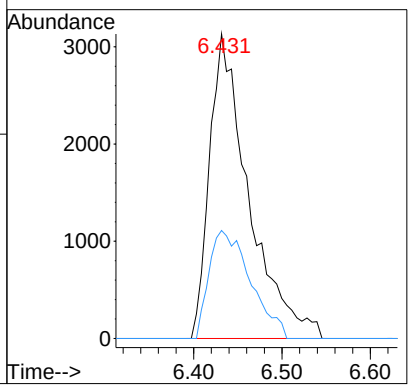


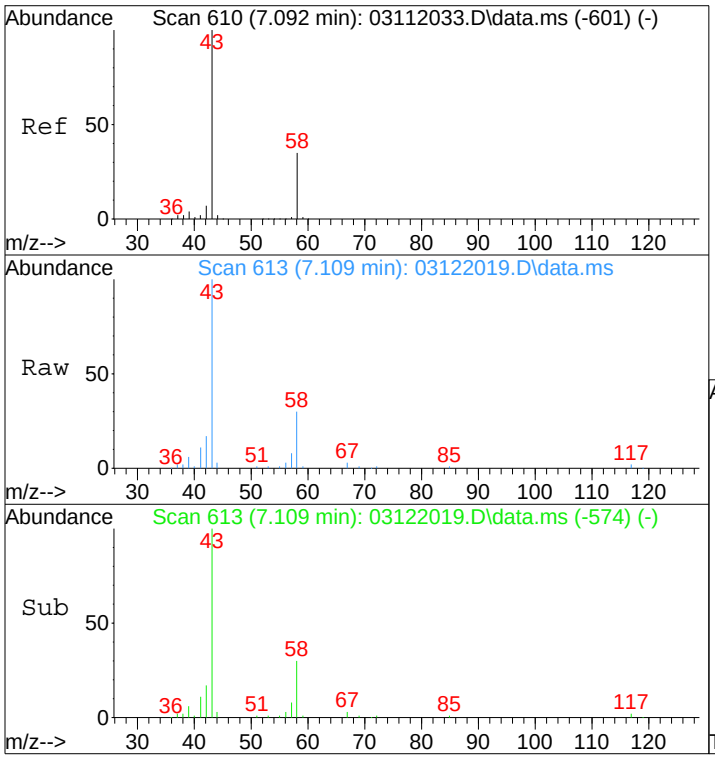


#10
Ethanol
Concen: 0.96 ng
RT: 6.43 min Scan# 494
Delta R.T. -0.103 min
Lab File: 03122019.D
Acq: 12 Mar 2020 12:00

Tgt Ion: 45 Resp: 9647

Ion	Ratio	Lower	Upper
45	100		
46	37.5	17.7	57.7

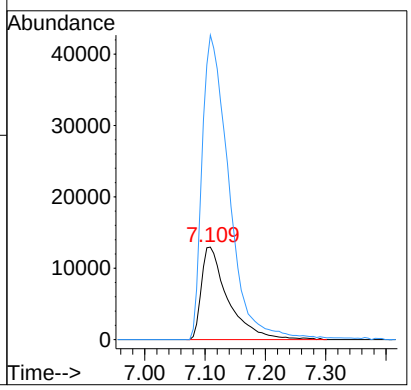


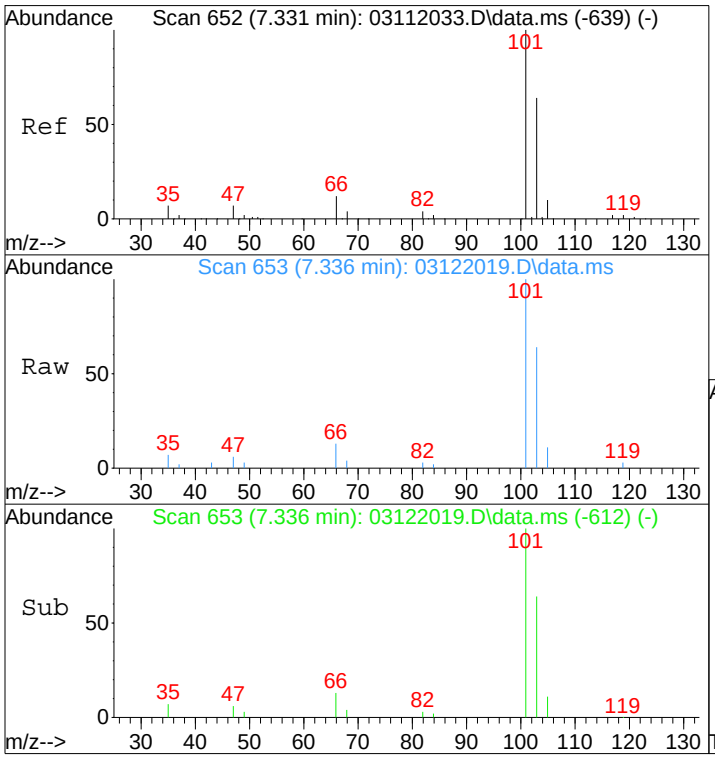


#13
Acetone
Concen: 3.95 ng
RT: 7.11 min Scan# 613
Delta R.T. -0.029 min
Lab File: 03122019.D
Acq: 12 Mar 2020 12:00

Tgt Ion: 58 Resp: 40022

Ion	Ratio	Lower	Upper
58	100		
43	332.2	260.2	320.2#

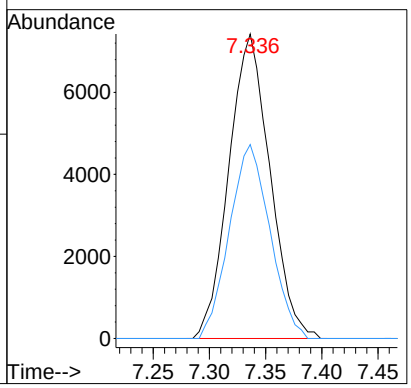


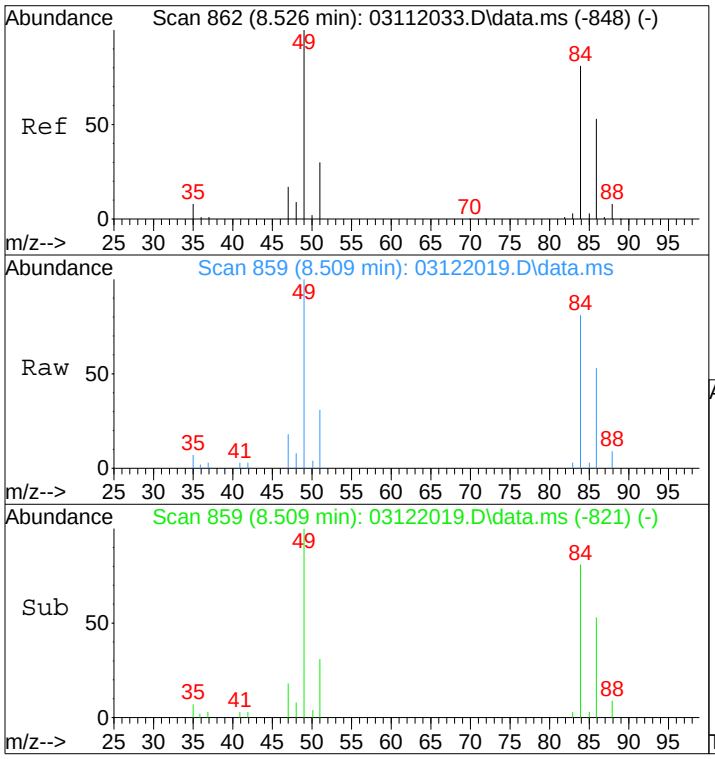


#14
Trichlorofluoromethane
Concen: 0.95 ng
RT: 7.34 min Scan# 653
Delta R.T. -0.017 min
Lab File: 03122019.D
Acq: 12 Mar 2020 12:00

Tgt Ion:101 Resp: 18918

Ion	Ratio	Lower	Upper
101	100		
103	62.8	44.8	84.8

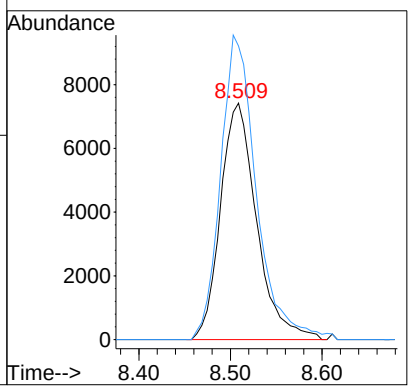


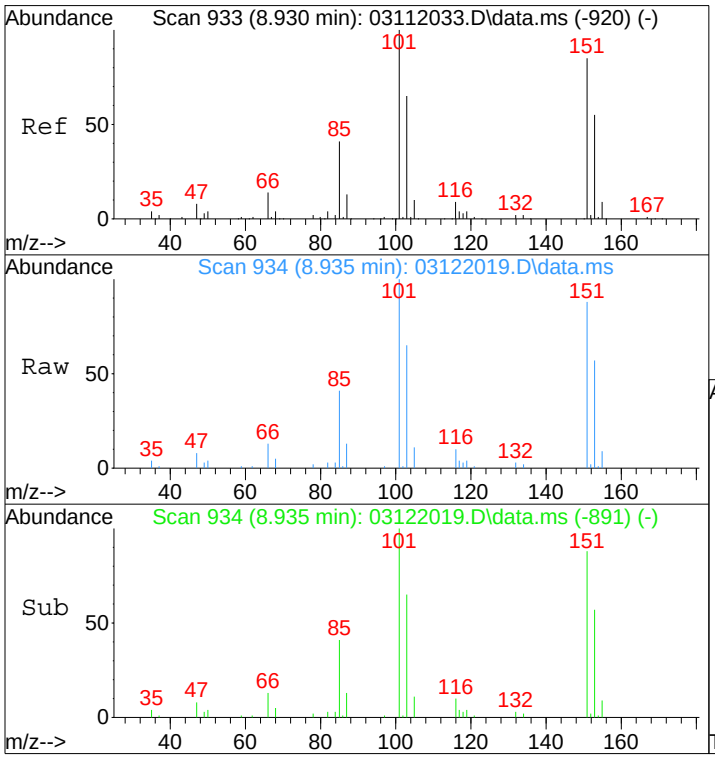


#19
Methylene Chloride
Concen: 1.62 ng
RT: 8.51 min Scan# 859
Delta R.T. -0.034 min
Lab File: 03122019.D
Acq: 12 Mar 2020 12:00

Tgt Ion: 84 Resp: 20364

Ion	Ratio	Lower	Upper
84	100		
49	127.4	100.8	150.8

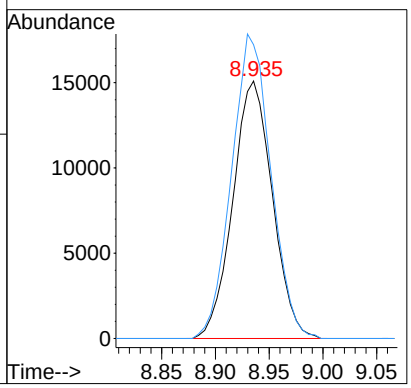


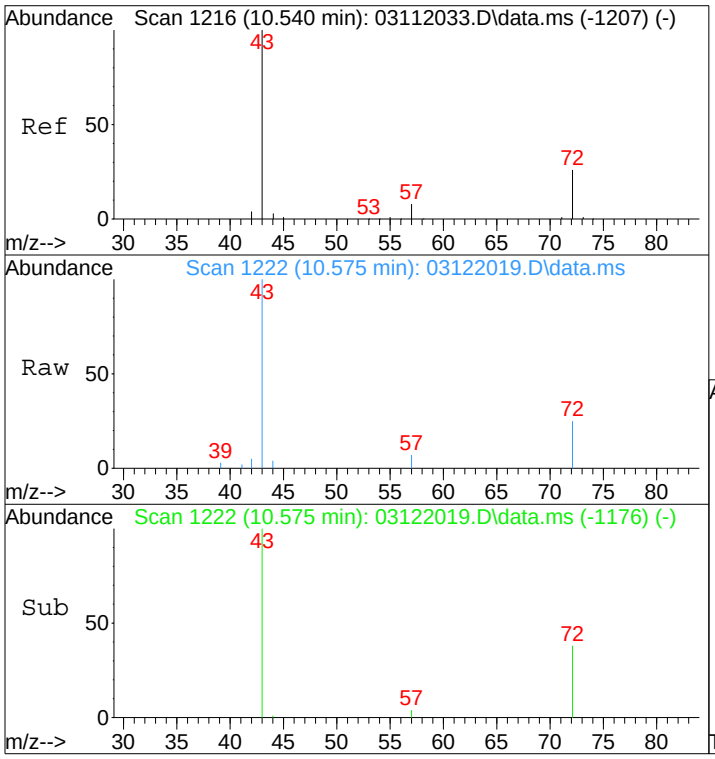


#21
Trichlorotrifluoroethane
Concen: 3.56 ng
RT: 8.94 min Scan# 934
Delta R.T. -0.006 min
Lab File: 03122019.D
Acq: 12 Mar 2020 12:00

Tgt Ion:151 Resp: 38662

Ion	Ratio	Lower	Upper
151	100		
101	117.5	97.6	137.6

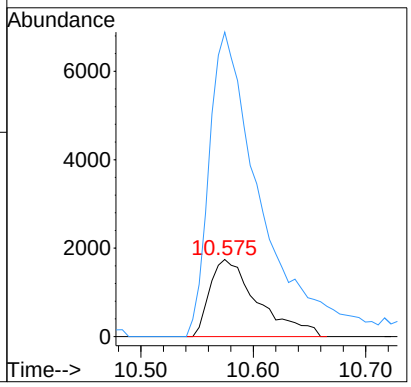


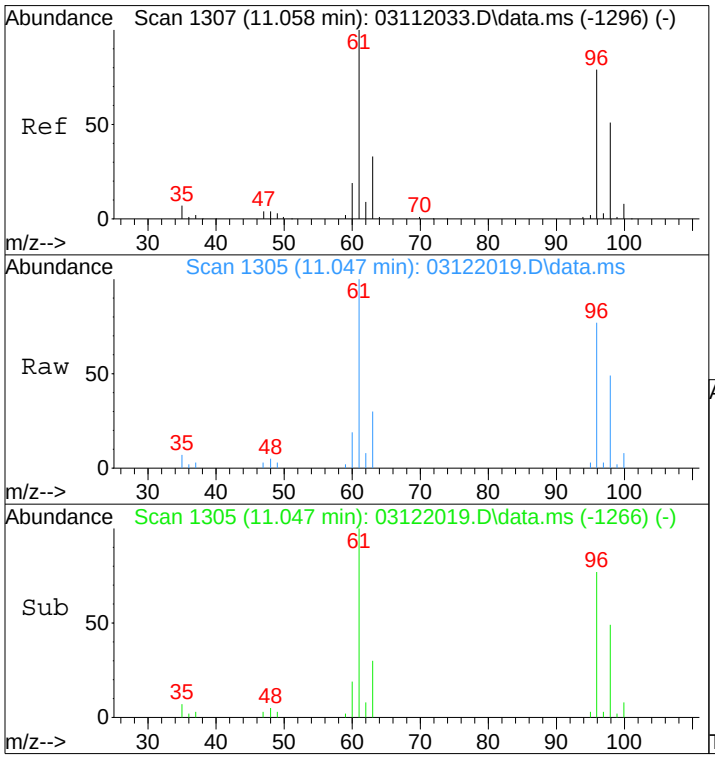


#27
2-Butanone (MEK)
Concen: 0.63 ng
RT: 10.57 min Scan# 1222
Delta R.T. 0.011 min
Lab File: 03122019.D
Acq: 12 Mar 2020 12:00

Tgt Ion: 72 Resp: 5163

Ion	Ratio	Lower	Upper
72	100		
43	433.1	360.3	400.3#

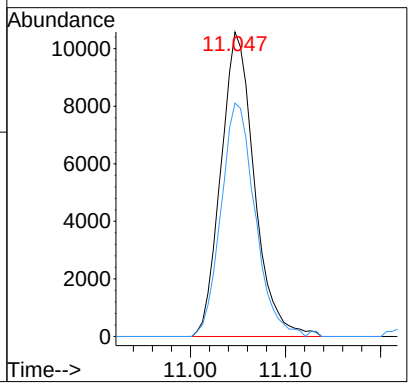


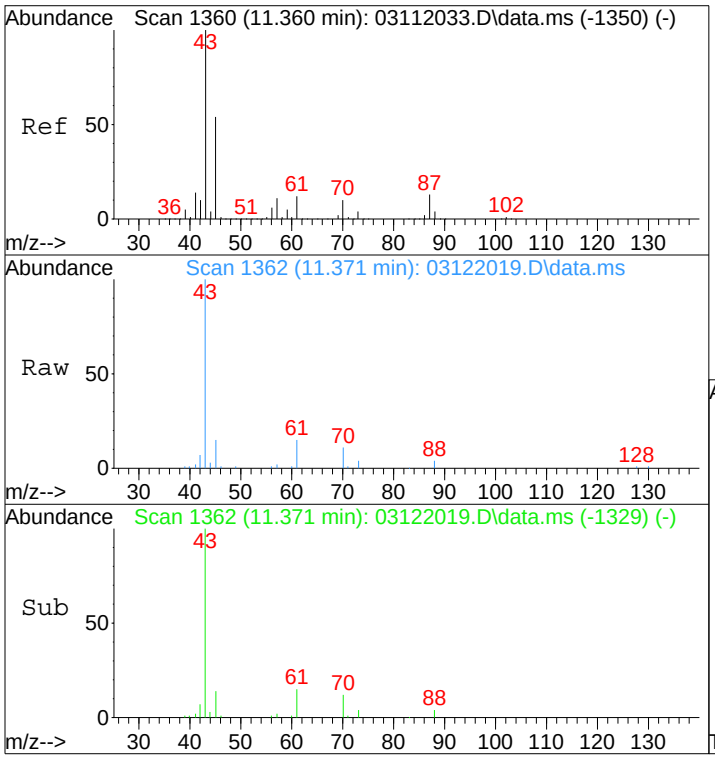


#28
cis-1,2-Dichloroethene
Concen: 1.58 ng
RT: 11.05 min Scan# 1305
Delta R.T. -0.029 min
Lab File: 03122019.D
Acq: 12 Mar 2020 12:00

Tgt Ion: 61 Resp: 25860

Ion	Ratio	Lower	Upper
61	100		
96	77.9	59.2	99.2

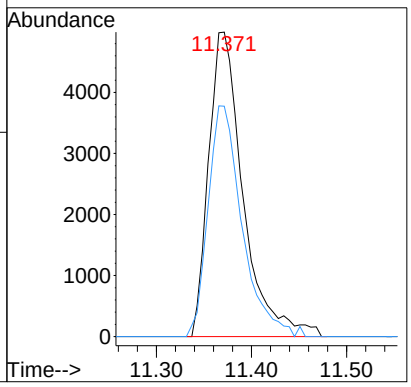


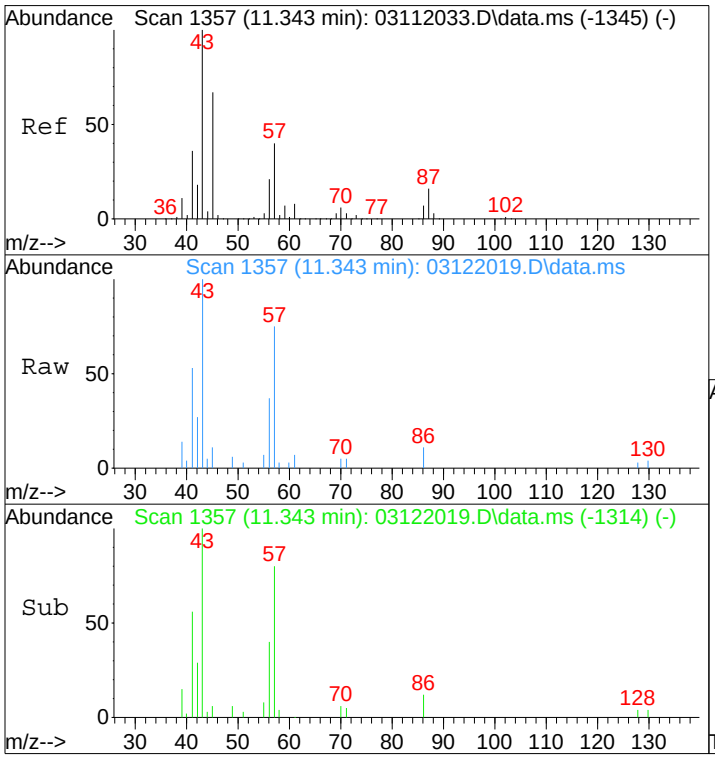


#30
Ethyl Acetate
Concen: 2.78 ng
RT: 11.37 min Scan# 1362
Delta R.T. -0.012 min
Lab File: 03122019.D
Acq: 12 Mar 2020 12:00

Tgt Ion: 61 Resp: 12545

Ion	Ratio	Lower	Upper
61	100		
70	74.9	60.2	100.2

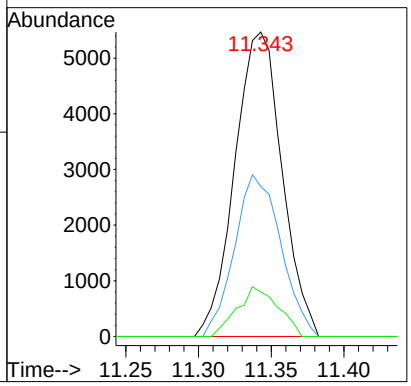


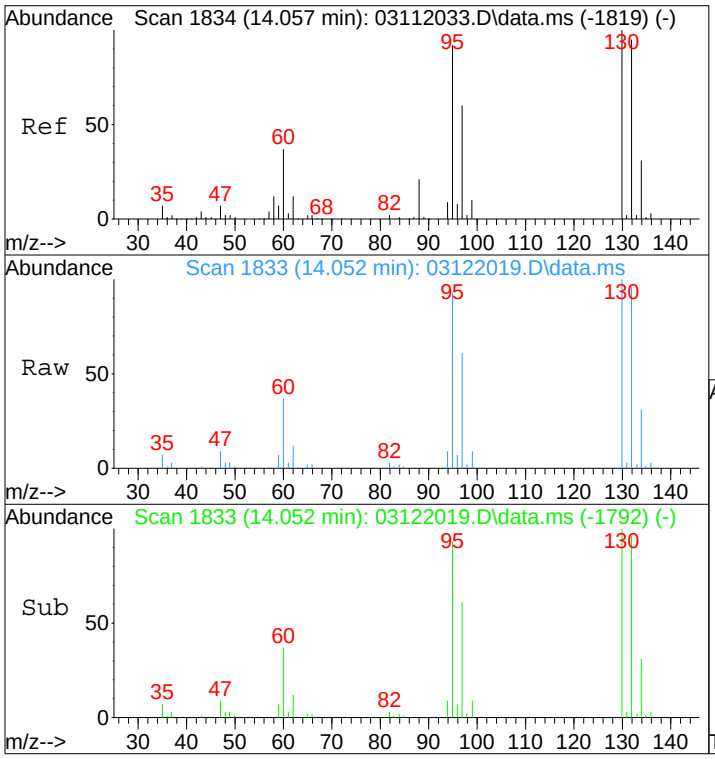


#31
n-Hexane
Concen: 0.58 ng
RT: 11.34 min Scan# 1357
Delta R.T. -0.006 min
Lab File: 03122019.D
Acq: 12 Mar 2020 12:00

Tgt Ion: 57 Resp: 12341

Ion	Ratio	Lower	Upper
57	100		
56	52.1	41.0	61.4
86	14.1	12.7	19.1

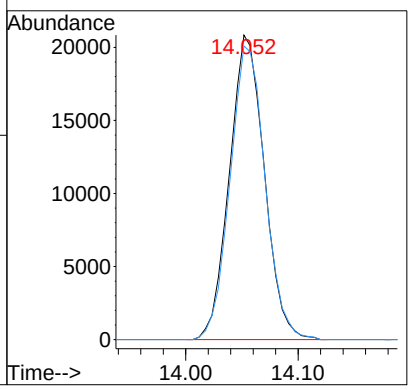




#47
Trichloroethene
Concen: 3.15 ng
RT: 14.05 min Scan# 1833
Delta R.T. -0.017 min
Lab File: 03122019.D
Acq: 12 Mar 2020 12:00

Tgt Ion:130 Resp: 45041

Ion	Ratio	Lower	Upper
130	100		
132	97.1	75.8	115.8



Quantitation Report (QT Reviewed)

Data File : I:\MS13\DATA\2020 03\12\03122021.D Vial: 8
Acq On : 12 Mar 2020 13:06 Operator: WA
Sample : P2001177-004 (1000mL) Inst : MS13
Misc : S31-01272001

Quant Time: Mar 16 13:34:05 2020
Quant Method : I:\MS13\METHODS\R13031120.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Mar 12 06:29:07 2020
Response via : Initial Calibration
DataAcq Meth:TO15.M

WA 3/16/20

Internal Standards	R.T.	QIon	Response	Conc	Units		Dev(Min)
1) Bromochloromethane (IS1)	11.22	130	126256	12.500	ng		-0.03
37) 1,4-Difluorobenzene (IS2)	13.35	114	587286	12.500	ng		-0.01
56) Chlorobenzene-d5 (IS3)	17.67	82	258795	12.500	ng		0.00
System Monitoring Compounds							
33) 1,2-Dichloroethane-d4(...	12.08	65	179798	12.866	ng		-0.03
Spiked Amount 12.500	Range 70 - 130		Recovery = 102.96%				
57) Toluene-d8 (SS2)	15.80	98	653157	12.454	ng		0.00
Spiked Amount 12.500	Range 70 - 130		Recovery = 99.60%				
73) Bromofluorobenzene (SS3)	19.05	174	183481	12.321	ng		0.00
Spiked Amount 12.500	Range 70 - 130		Recovery = 98.56%				
Target Compounds							Qvalue
2) Propene	0.00	42	0	N.D.	d		
3) Dichlorodifluoromethan...	4.33	85	40548	1.767	ng		99
4) Chloromethane	4.62	50	2690	N.D.			
5) 1,2-Dichloro-1,1,2,2-t...	4.88	135	985	N.D.			
6) Vinyl Chloride	5.04	62	231	N.D.			
7) 1,3-Butadiene	0.00	54	0	N.D.			
8) Bromomethane	0.00	94	0	N.D.			
9) Chloroethane	0.00	64	0	N.D.			
10) Ethanol	6.43	45	9577	0.971	ng		97
11) Acetonitrile	6.70	41	2280	N.D.			
12) Acrolein	6.91	56	642	N.D.			
13) Acetone	7.10	58	37834	3.805	ng	#	72
14) Trichlorofluoromethane	7.34	101	18745	0.956	ng		100
15) 2-Propanol (Isopropanol)	7.67	45	2787	N.D.			
16) Acrylonitrile	7.92	53	336	N.D.			
17) 1,1-Dichloroethene	0.00	96	0	N.D.			
18) 2-Methyl-2-Propanol (t...	8.60	59	155	N.D.			
19) Methylene Chloride	8.51	84	8366	0.677	ng		97
20) 3-Chloro-1-propene (Al...	8.59	41	171	N.D.			
21) Trichlorotrifluoroethane	8.94	151	18009	1.687	ng		98
22) Carbon Disulfide	8.79	76	9847	N.D.			
23) trans-1,2-Dichloroethene	0.00	61	0	N.D.			
24) 1,1-Dichloroethane	0.00	63	0	N.D.			
25) Methyl tert-Butyl Ether	0.00	73	0	N.D.			
26) Vinyl Acetate	10.29	86	633	N.D.			
27) 2-Butanone (MEK)	10.57	72	5022	0.626	ng	#	72
28) cis-1,2-Dichloroethene	11.05	61	8410	0.522	ng		99
29) Diisopropyl Ether	0.00	87	0	N.D.			
30) Ethyl Acetate	11.37	61	13003	2.936	ng		88
31) n-Hexane	11.34	57	12440	0.595	ng		98
32) Chloroform	11.40	83	1042	N.D.			
34) Tetrahydrofuran (THF)	11.88	72	1397	N.D.			
35) Ethyl tert-Butyl Ether	0.00	87	0	N.D.			
36) 1,2-Dichloroethane	12.20	62	703	N.D.			
38) 1,1,1-Trichloroethane	0.00	97	0	N.D.			
39) Isopropyl Acetate	0.00	61	0	N.D.			
40) 1-Butanol	13.02	56	1007	N.D.			
41) Benzene	12.95	78	18178	N.D.			
42) Carbon Tetrachloride	13.12	117	4899	N.D.			
43) Cyclohexane	13.26	84	2238	N.D.			
44) tert-Amyl Methyl Ether	0.00	73	0	N.D.			
45) 1,2-Dichloropropane	0.00	63	0	N.D.			
46) Bromodichloromethane	0.00	83	0	N.D.			
47) Trichloroethene	14.06	130	15427	1.099	ng		99
48) 1,4-Dioxane	0.00	88	0	N.D.			
49) 2,2,4-Trimethylpentane...	14.12	57	3819	N.D.			
50) Methyl Methacrylate	14.39	100	364	N.D.			

Data File : I:\MS13\DATA\2020 03\12\03122021.D Vial: 8
Acq On : 12 Mar 2020 13:06 Operator: WA
Sample : P2001177-004 (1000mL) Inst : MS13
Misc : S31-01272001

Quant Time: Mar 16 13:34:05 2020
Quant Method : I:\MS13\METHODS\R13031120.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Mar 12 06:29:07 2020
Response via : Initial Calibration
DataAcq Meth:TO15.M

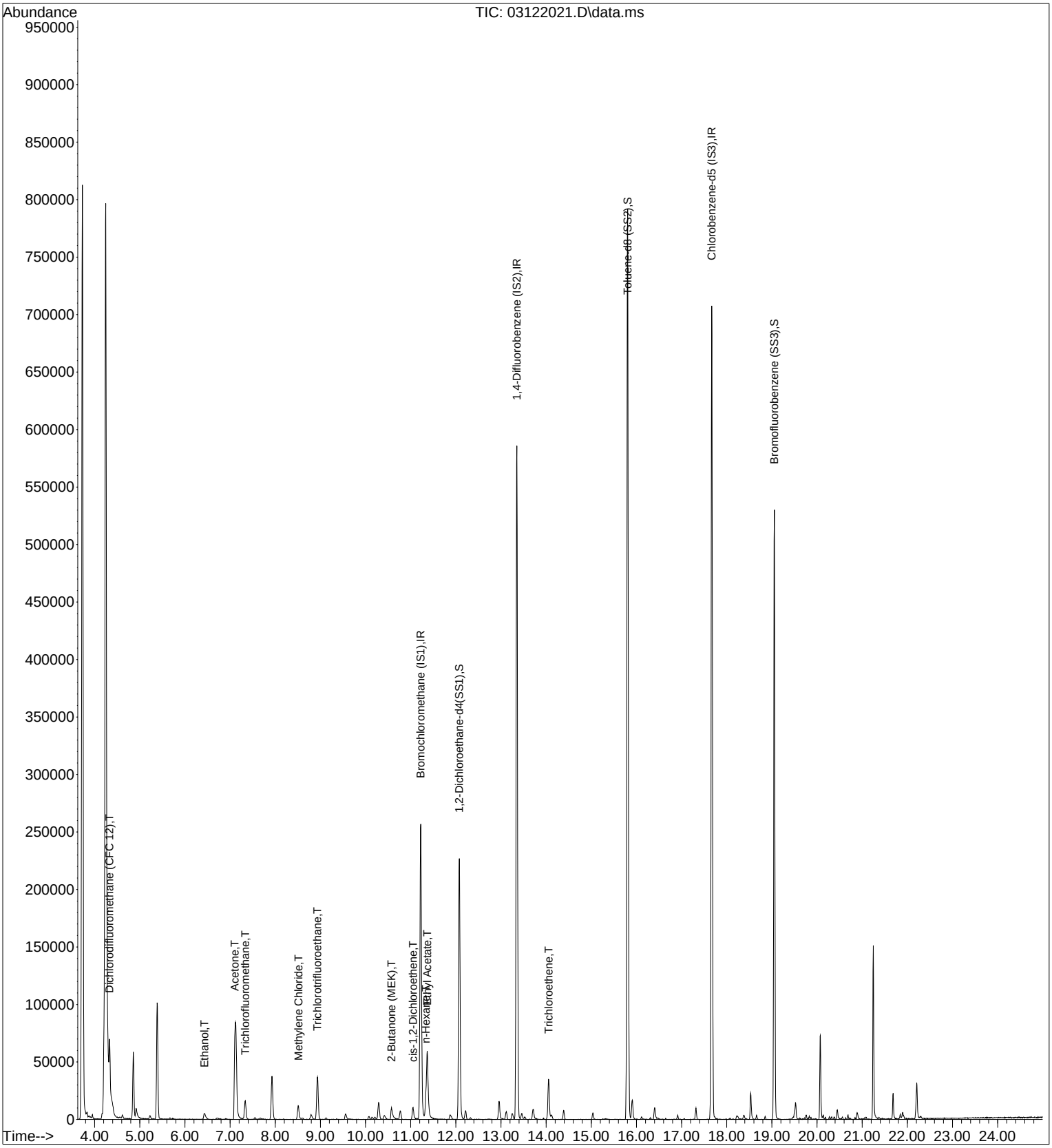
Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
51) n-Heptane	14.39	71	1883	N.D.	
52) cis-1,3-Dichloropropene	0.00	75	0	N.D.	
53) 4-Methyl-2-pentanone	0.00	58	0	N.D.	
54) trans-1,3-Dichloropropene	0.00	75	0	N.D.	
55) 1,1,2-Trichloroethane	0.00	97	0	N.D.	
58) Toluene	15.91	91	15335	N.D.	
59) 2-Hexanone	16.11	43	2034	N.D.	
60) Dibromochloromethane	0.00	129	0	N.D.	
61) 1,2-Dibromoethane	0.00	107	0	N.D.	
62) n-Butyl Acetate	16.84	43	762	N.D.	
63) n-Octane	16.91	57	631	N.D.	
64) Tetrachloroethene	17.06	166	261	N.D.	
65) Chlorobenzene	0.00	112	0	N.D.	
66) Ethylbenzene	18.07	91	1681	N.D.	
67) m- & p-Xylenes	18.22	91	3978	N.D.	
68) Bromoform	0.00	173	0	N.D.	
69) Styrene	18.57	104	685	N.D.	
70) o-Xylene	18.66	91	1504	N.D.	
71) n-Nonane	18.85	43	1325	N.D.	
72) 1,1,2,2-Tetrachloroethane	0.00	83	0	N.D.	
74) Cumene	0.00	105	0	N.D.	
75) alpha-Pinene	19.53	93	5030	N.D.	
76) n-Propylbenzene	19.63	91	583	N.D.	
77) 3-Ethyltoluene	19.73	105	838	N.D.	
78) 4-Ethyltoluene	19.75	105	724	N.D.	
79) 1,3,5-Trimethylbenzene	19.82	105	386	N.D.	
80) alpha-Methylstyrene	19.96	118	365	N.D.	
81) 2-Ethyltoluene	20.00	105	278	N.D.	
82) 1,2,4-Trimethylbenzene	20.19	105	1249	N.D.	
83) n-Decane	20.27	57	773	N.D.	
84) Benzyl Chloride	20.30	91	272	N.D.	
85) 1,3-Dichlorobenzene	20.32	146	749	N.D.	
86) 1,4-Dichlorobenzene	20.38	146	1391	N.D.	
87) sec-Butylbenzene	20.57	105	141	N.D.	
88) 4-Isopropyltoluene (p-...	20.56	119	1331	N.D.	
89) 1,2,3-Trimethylbenzene	20.57	105	141	N.D.	
90) 1,2-Dichlorobenzene	20.68	146	520	N.D.	
91) d-Limonene	20.69	68	962	N.D.	
92) 1,2-Dibromo-3-Chloropr...	0.00	157	0	N.D.	
93) n-Undecane	21.37	57	814	N.D.	
94) 1,2,4-Trichlorobenzene	22.19	180	4299	N.D.	
95) Naphthalene	22.30	128	1901	N.D.	
96) n-Dodecane	22.28	57	667	N.D.	
97) Hexachlorobutadiene	0.00	225	0	N.D.	
98) Cyclohexanone	18.38	55	1843	N.D.	
99) tert-Butylbenzene	0.00	119	0	N.D.	
100) n-Butylbenzene	20.90	91	662	N.D.	

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data File : I:\MS13\DATA\2020 03\12\03122021.D Vial: 8
Acq On : 12 Mar 2020 13:06 Operator: WA
Sample : P2001177-004 (1000mL) Inst : MS13
Misc : S31-01272001

Quant Time: Mar 16 13:34:05 2020
Quant Method : I:\MS13\METHODS\R13031120.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Mar 12 06:29:07 2020
Response via : Initial Calibration
DataAcq Meth:TO15.M



Quantitation Report (QT Reviewed)

Data File : I:\MS13\DATA\2020 03\12\03122021.D Vial: 8
Acq On : 12 Mar 2020 13:06 Operator: WA
Sample : P2001177-004 (1000mL) Inst : MS13
Misc : S31-01272001

Quant Time: Mar 16 13:34:05 2020
Quant Method : I:\MS13\METHODS\R13031120.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Mar 12 06:29:07 2020 WA 3/16/20
Response via : Initial Calibration
DataAcq Meth:TO15.M

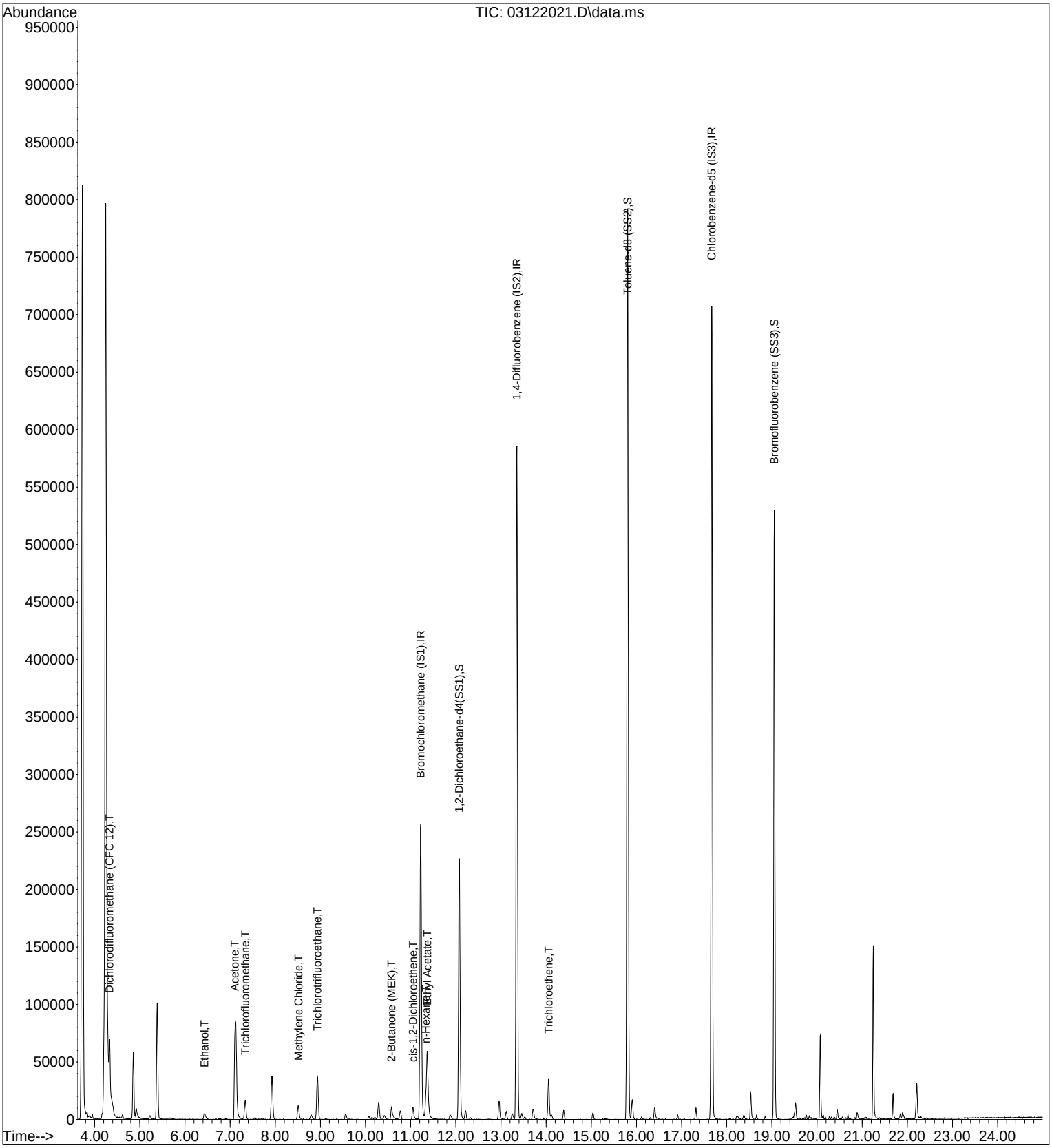
Internal Standards	R.T.	QIon	Response	Conc	Units		Dev(Min)
1) Bromochloromethane (IS1)	11.22	130	126256	12.500	ng		-0.03
37) 1,4-Difluorobenzene (IS2)	13.35	114	587286	12.500	ng		-0.01
56) Chlorobenzene-d5 (IS3)	17.67	82	258795	12.500	ng		0.00
System Monitoring Compounds							
33) 1,2-Dichloroethane-d4(...	12.08	65	179798	12.866	ng		-0.03
Spiked Amount 12.500	Range 70 - 130		Recovery = 102.96%				
57) Toluene-d8 (SS2)	15.80	98	653157	12.454	ng		0.00
Spiked Amount 12.500	Range 70 - 130		Recovery = 99.60%				
73) Bromofluorobenzene (SS3)	19.05	174	183481	12.321	ng		0.00
Spiked Amount 12.500	Range 70 - 130		Recovery = 98.56%				
Target Compounds							Qvalue
3) Dichlorodifluoromethan...	4.33	85	40548	1.767	ng		99
10) Ethanol	6.43	45	9577	0.971	ng		97
13) Acetone	7.10	58	37834	3.805	ng	#	72
14) Trichlorofluoromethane	7.34	101	18745	0.956	ng		100
19) Methylene Chloride	8.51	84	8366	0.677	ng		97
21) Trichlorotrifluoroethane	8.94	151	18009	1.687	ng		98
27) 2-Butanone (MEK)	10.57	72	5022	0.626	ng	#	72
28) cis-1,2-Dichloroethene	11.05	61	8410	0.522	ng		99
30) Ethyl Acetate	11.37	61	13003	2.936	ng		88
31) n-Hexane	11.34	57	12440	0.595	ng		98
47) Trichloroethene	14.06	130	15427	1.099	ng		99

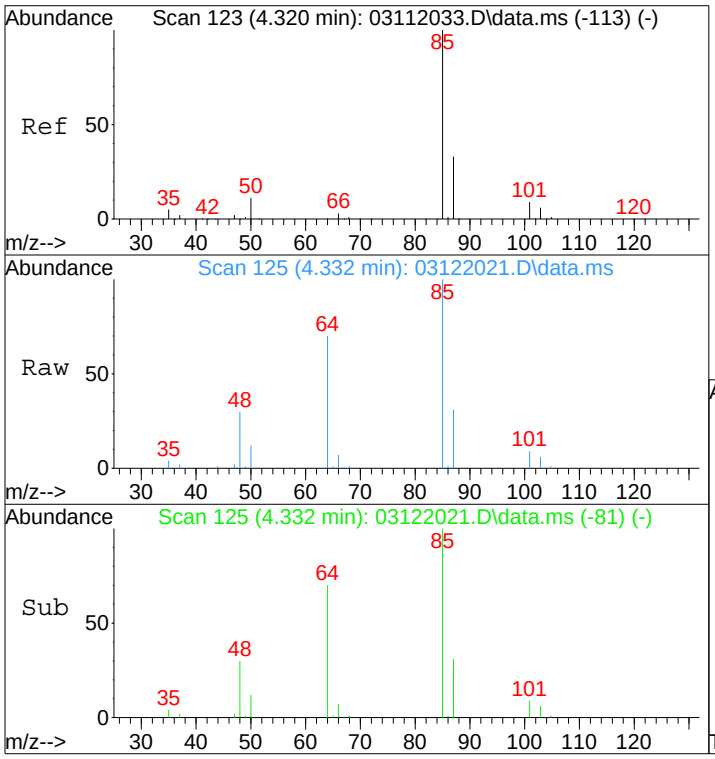
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data File : I:\MS13\DATA\2020 03\12\03122021.D Vial: 8
Acq On : 12 Mar 2020 13:06 Operator: WA
Sample : P2001177-004 (1000mL) Inst : MS13
Misc : S31-01272001

Quant Time: Mar 16 13:34:05 2020
Quant Method : I:\MS13\METHODS\R13031120.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Mar 12 06:29:07 2020
Response via : Initial Calibration
DataAcq Meth:TO15.M

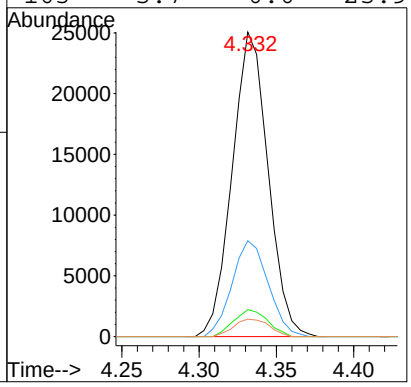


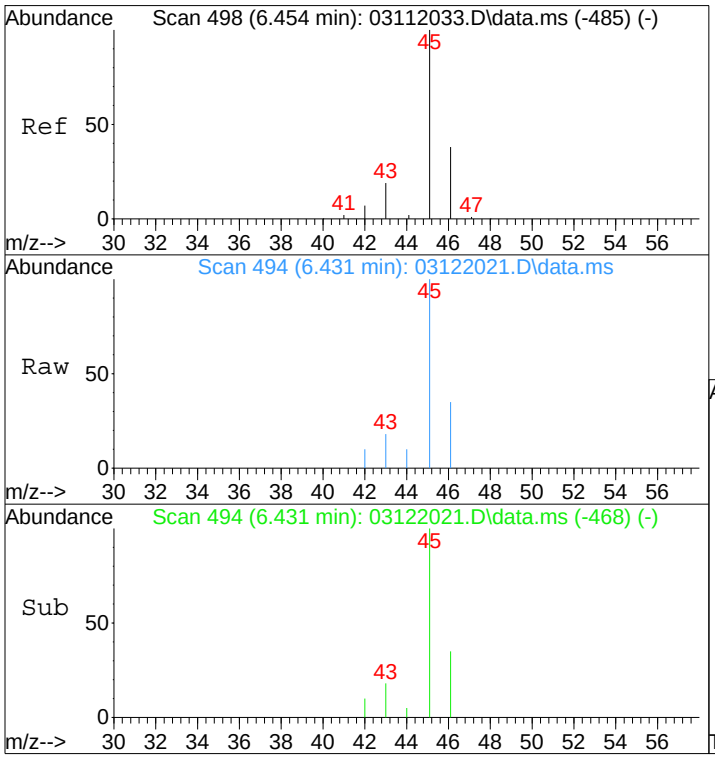


#3
Dichlorodifluoromethane (CFC 12)
Concen: 1.77 ng
RT: 4.33 min Scan# 125
Delta R.T. -0.000 min
Lab File: 03122021.D
Acq: 12 Mar 2020 13:06

Tgt Ion: 85 Resp: 40548

Ion	Ratio	Lower	Upper
85	100		
87	31.8	12.5	52.5
101	8.4	0.0	29.0
103	5.7	0.0	25.9

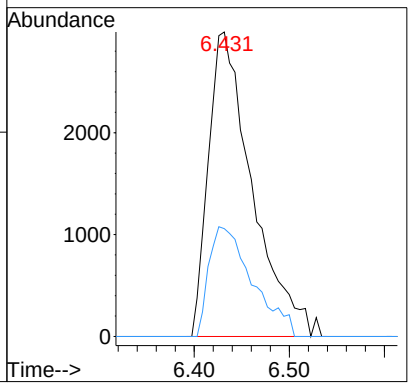


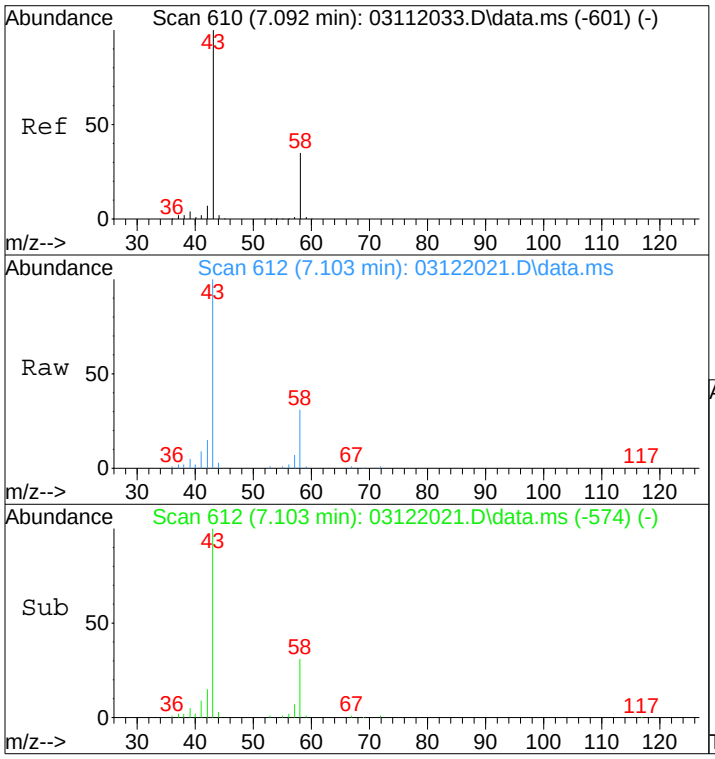


#10
Ethanol
Concen: 0.97 ng
RT: 6.43 min Scan# 494
Delta R.T. -0.103 min
Lab File: 03122021.D
Acq: 12 Mar 2020 13:06

Tgt Ion: 45 Resp: 9577

Ion	Ratio	Lower	Upper
45	100		
46	35.7	17.7	57.7

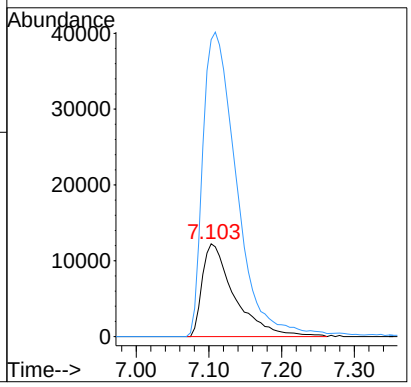


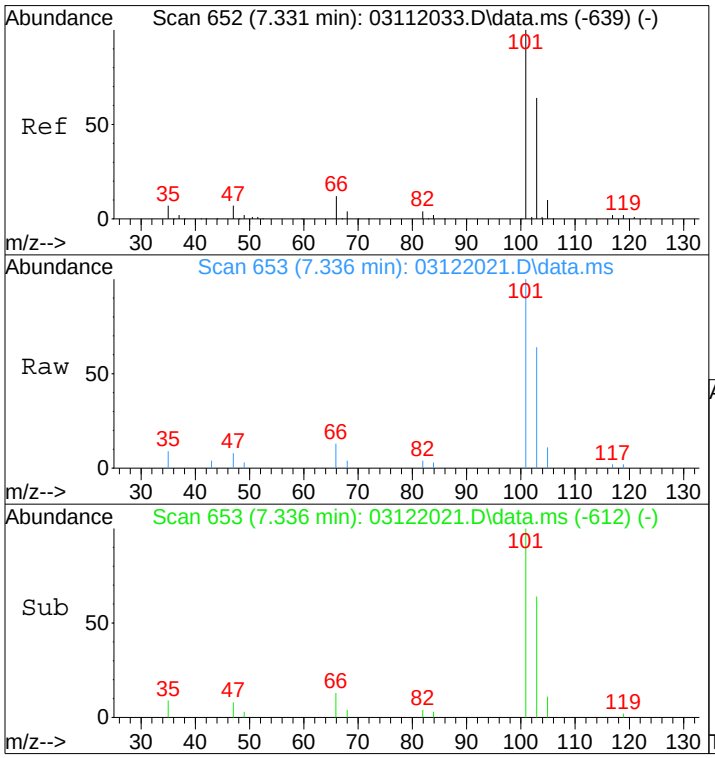


#13
Acetone
Concen: 3.80 ng
RT: 7.10 min Scan# 612
Delta R.T. -0.034 min
Lab File: 03122021.D
Acq: 12 Mar 2020 13:06

Tgt Ion: 58 Resp: 37834

Ion	Ratio	Lower	Upper
58	100		
43	344.4	260.2	320.2#

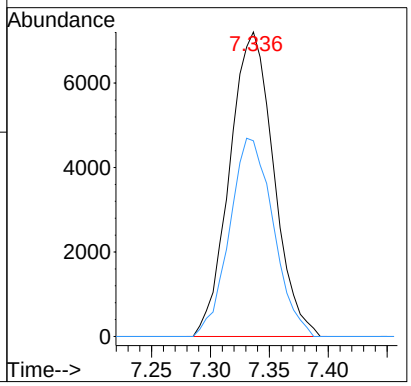


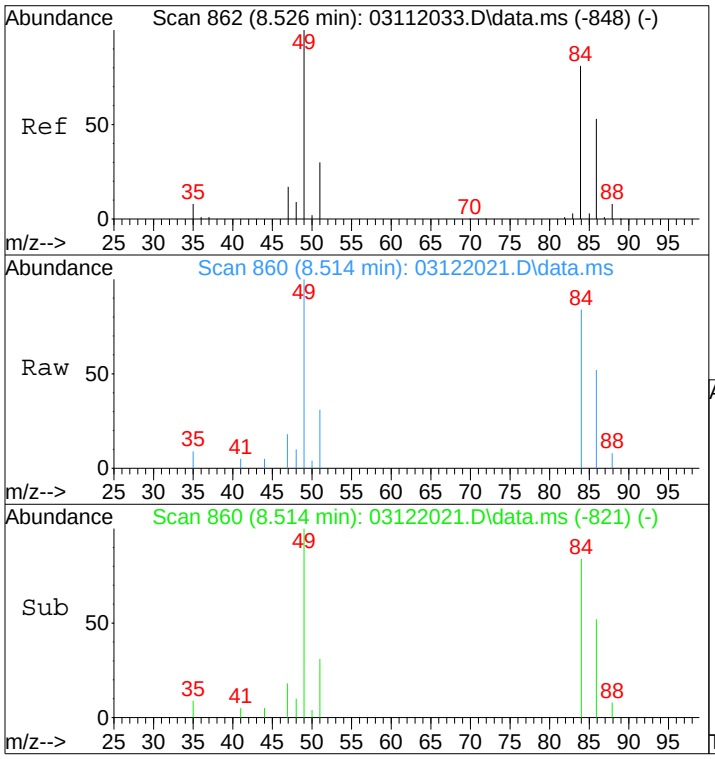


#14
Trichlorofluoromethane
Concen: 0.96 ng
RT: 7.34 min Scan# 653
Delta R.T. -0.017 min
Lab File: 03122021.D
Acq: 12 Mar 2020 13:06

Tgt Ion:101 Resp: 18745

Ion	Ratio	Lower	Upper
101	100		
103	64.7	44.8	84.8

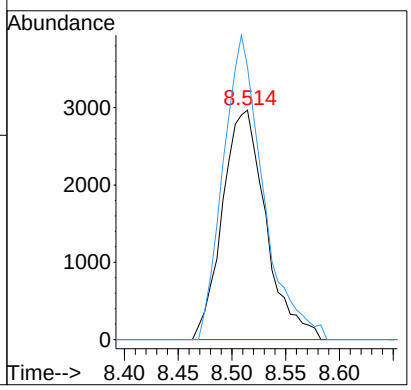


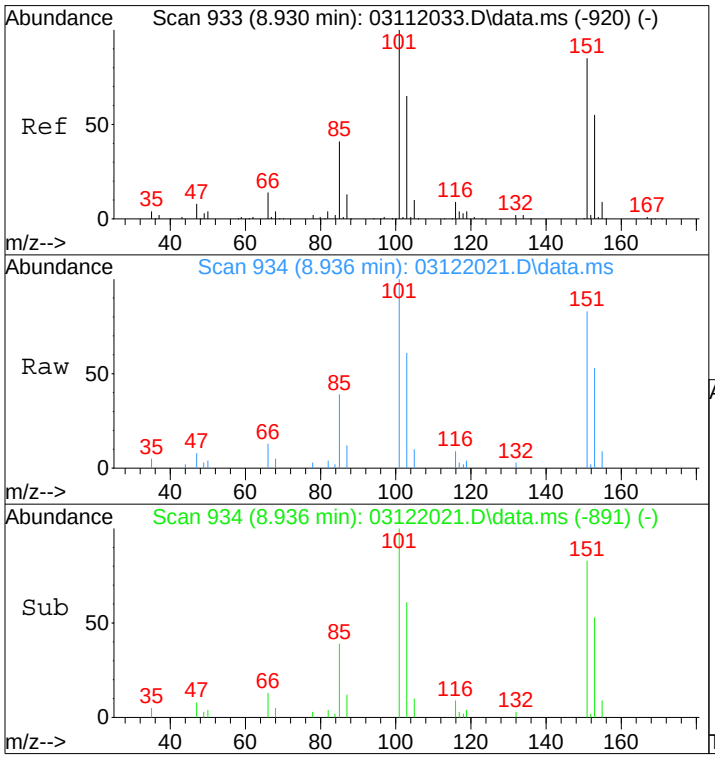


#19
Methylene Chloride
Concen: 0.68 ng
RT: 8.51 min Scan# 860
Delta R.T. -0.029 min
Lab File: 03122021.D
Acq: 12 Mar 2020 13:06

Tgt Ion: 84 Resp: 8366

Ion	Ratio	Lower	Upper
84	100		
49	122.2	100.8	150.8

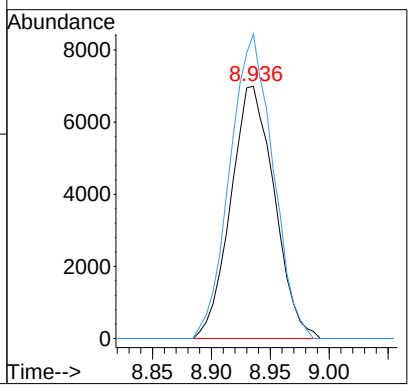


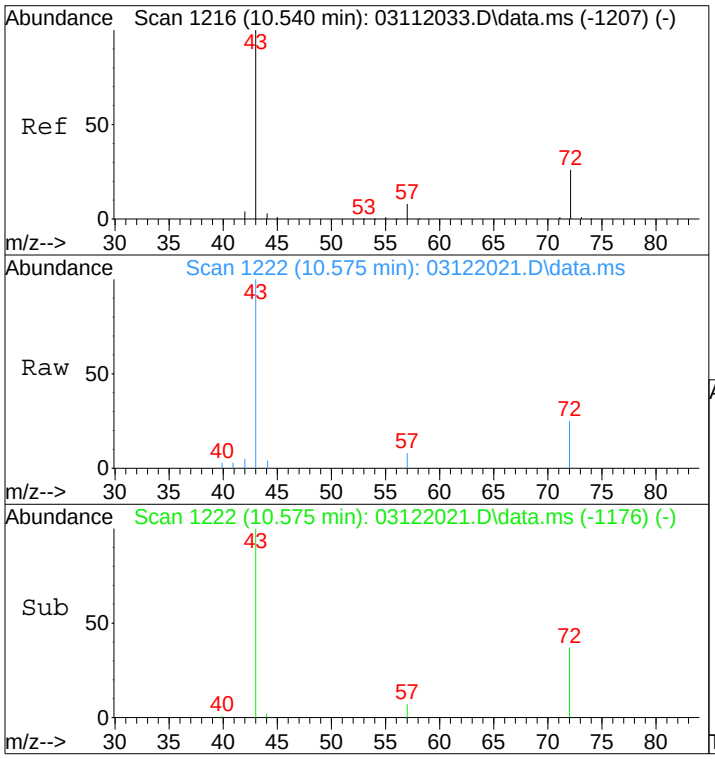


#21
Trichlorotrifluoroethane
Concen: 1.69 ng
RT: 8.94 min Scan# 934
Delta R.T. -0.006 min
Lab File: 03122021.D
Acq: 12 Mar 2020 13:06

Tgt Ion:151 Resp: 18009

Ion	Ratio	Lower	Upper
151	100		
101	119.3	97.6	137.6

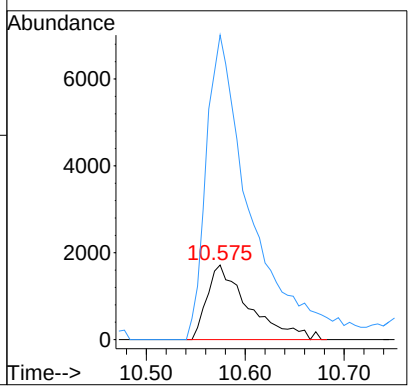


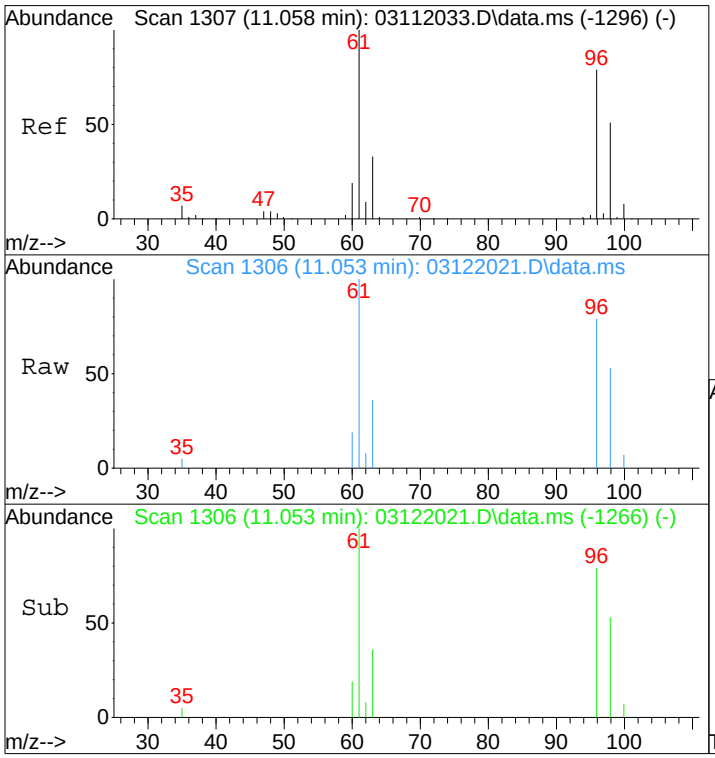


#27
2-Butanone (MEK)
Concen: 0.63 ng
RT: 10.57 min Scan# 1222
Delta R.T. 0.011 min
Lab File: 03122021.D
Acq: 12 Mar 2020 13:06

Tgt Ion: 72 Resp: 5022

Ion	Ratio	Lower	Upper
72	100		
43	444.5	360.3	400.3#

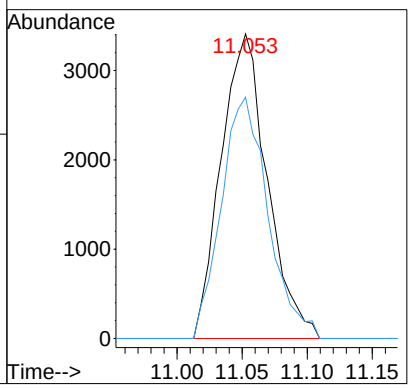


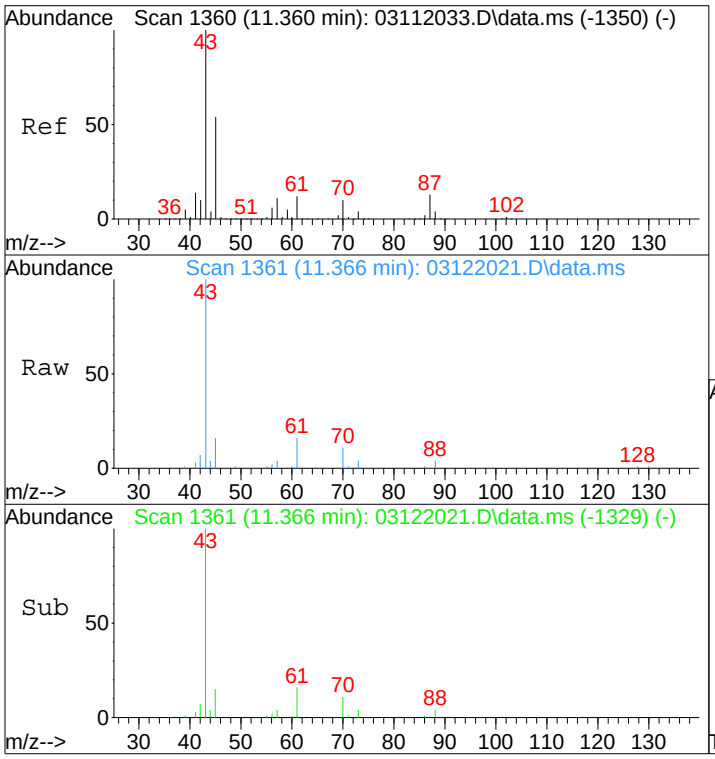


#28
cis-1,2-Dichloroethene
Concen: 0.52 ng
RT: 11.05 min Scan# 1306
Delta R.T. -0.023 min
Lab File: 03122021.D
Acq: 12 Mar 2020 13:06

Tgt Ion: 61 Resp: 8410

Ion	Ratio	Lower	Upper
61	100		
96	80.2	59.2	99.2

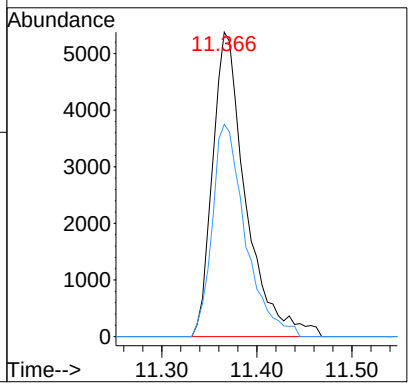


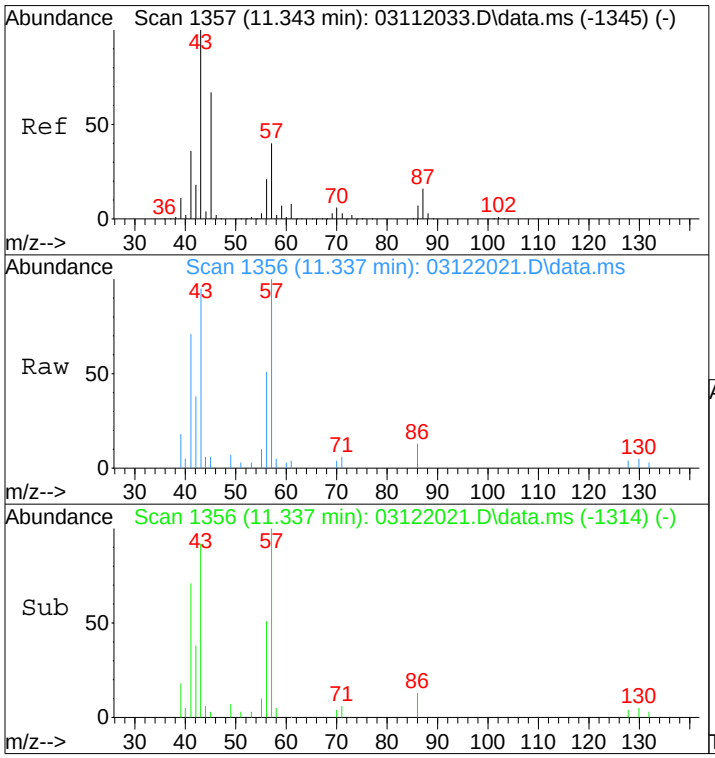


#30
Ethyl Acetate
Concen: 2.94 ng
RT: 11.37 min Scan# 1361
Delta R.T. -0.017 min
Lab File: 03122021.D
Acq: 12 Mar 2020 13:06

Tgt Ion: 61 Resp: 13003

Ion	Ratio	Lower	Upper
61	100		
70	69.7	60.2	100.2

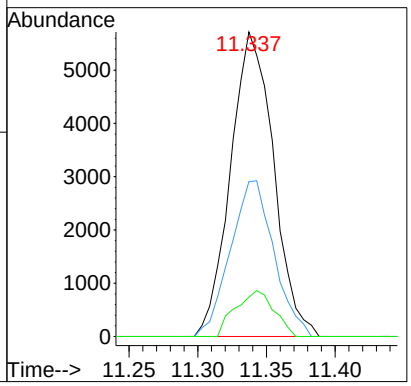


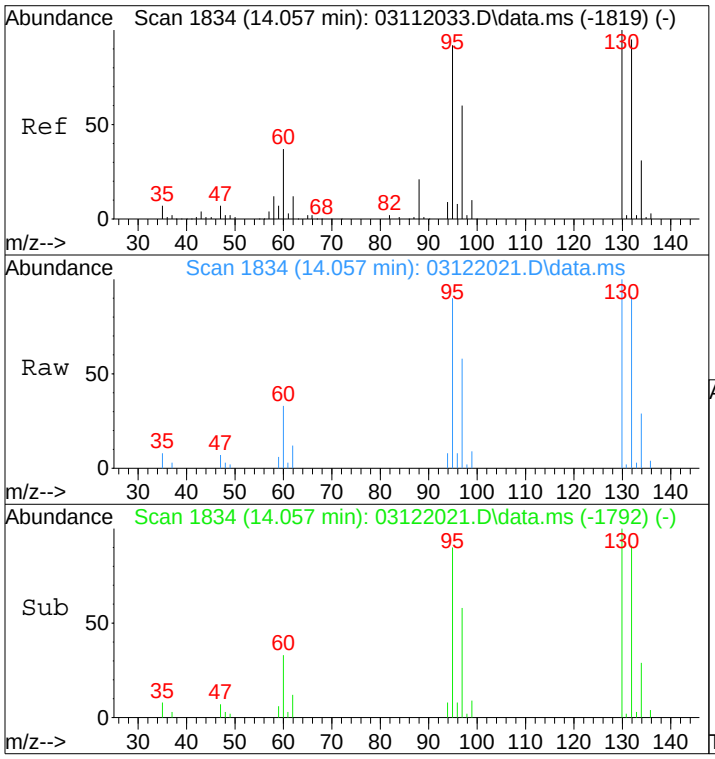


#31
n-Hexane
Concen: 0.60 ng
RT: 11.34 min Scan# 1356
Delta R.T. -0.012 min
Lab File: 03122021.D
Acq: 12 Mar 2020 13:06

Tgt Ion: 57 Resp: 12440

Ion	Ratio	Lower	Upper
57	100		
56	51.8	41.0	61.4
86	13.5	12.7	19.1

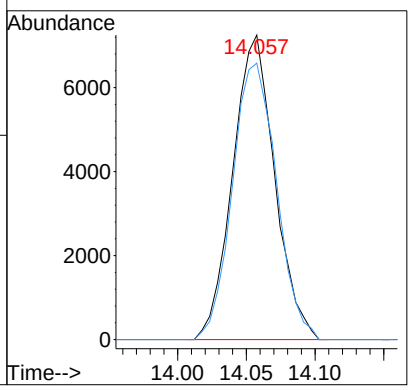




#47
Trichloroethene
Concen: 1.10 ng
RT: 14.06 min Scan# 1834
Delta R.T. -0.012 min
Lab File: 03122021.D
Acq: 12 Mar 2020 13:06

Tgt Ion:130 Resp: 15427

Ion	Ratio	Lower	Upper
130	100		
132	95.3	75.8	115.8



Quantitation Report (QT Reviewed)

Data File : I:\MS13\DATA\2020 03\12\03122003.D Vial: 1
Acq On : 12 Mar 2020 1:29 Operator: WA
Sample : MB R13031220 1000mL Inst : MS13
Misc : S31-01272001/AC01837

Quant Time: Mar 12 11:38:15 2020
Quant Method : I:\MS13\METHODS\R13031120.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Mar 12 06:29:07 2020
Response via : Initial Calibration
DataAcq Meth:TO15.M

WA 3/12/20

Internal Standards	R.T.	QIon	Response	Conc	Units		Dev(Min)
1) Bromochloromethane (IS1)	11.22	130	126898	12.500	ng		-0.03
37) 1,4-Difluorobenzene (IS2)	13.35	114	594173	12.500	ng		-0.01
56) Chlorobenzene-d5 (IS3)	17.67	82	260127	12.500	ng		0.00
System Monitoring Compounds							
33) 1,2-Dichloroethane-d4(...	12.08	65	180893	12.879	ng		-0.03
Spiked Amount 12.500	Range 70 - 130		Recovery = 103.04%				
57) Toluene-d8 (SS2)	15.80	98	660874	12.537	ng		0.00
Spiked Amount 12.500	Range 70 - 130		Recovery = 100.32%				
73) Bromofluorobenzene (SS3)	19.05	174	182744	12.208	ng		0.00
Spiked Amount 12.500	Range 70 - 130		Recovery = 97.68%				
Target Compounds							Qvalue
2) Propene	4.23	42	696	N.D.			
3) Dichlorodifluoromethan...	4.26	85	337	N.D.			
4) Chloromethane	0.00	50	0	N.D.			
5) 1,2-Dichloro-1,1,2,2-t...	0.00	135	0	N.D.			
6) Vinyl Chloride	0.00	62	0	N.D.			
7) 1,3-Butadiene	0.00	54	0	N.D.			
8) Bromomethane	0.00	94	0	N.D.			
9) Chloroethane	0.00	64	0	N.D.			
10) Ethanol	6.47	45	2693	0.272	ng		96
11) Acetonitrile	6.75	41	1110	N.D.			
12) Acrolein	0.00	56	0	N.D.			
13) Acetone	7.19	58	1806	0.181	ng	#	20
14) Trichlorofluoromethane	0.00	101	0	N.D.			
15) 2-Propanol (Isopropanol)	7.72	45	893	N.D.			
16) Acrylonitrile	0.00	53	0	N.D.			
17) 1,1-Dichloroethene	0.00	96	0	N.D.			
18) 2-Methyl-2-Propanol (t...	0.00	59	0	N.D.			
19) Methylene Chloride	0.00	84	0	N.D.			
20) 3-Chloro-1-propene (Al...	0.00	41	0	N.D.			
21) Trichlorotrifluoroethane	0.00	151	0	N.D.			
22) Carbon Disulfide	0.00	76	0	N.D.	d		
23) trans-1,2-Dichloroethene	0.00	61	0	N.D.			
24) 1,1-Dichloroethane	0.00	63	0	N.D.			
25) Methyl tert-Butyl Ether	0.00	73	0	N.D.			
26) Vinyl Acetate	0.00	86	0	N.D.			
27) 2-Butanone (MEK)	0.00	72	0	N.D.			
28) cis-1,2-Dichloroethene	0.00	61	0	N.D.			
29) Diisopropyl Ether	0.00	87	0	N.D.			
30) Ethyl Acetate	0.00	61	0	N.D.			
31) n-Hexane	0.00	57	0	N.D.			
32) Chloroform	0.00	83	0	N.D.			
34) Tetrahydrofuran (THF)	11.91	72	179	N.D.			
35) Ethyl tert-Butyl Ether	0.00	87	0	N.D.			
36) 1,2-Dichloroethane	0.00	62	0	N.D.			
38) 1,1,1-Trichloroethane	0.00	97	0	N.D.			
39) Isopropyl Acetate	0.00	61	0	N.D.			
40) 1-Butanol	13.06	56	404	N.D.			
41) Benzene	12.96	78	2293	N.D.			
42) Carbon Tetrachloride	0.00	117	0	N.D.			
43) Cyclohexane	13.34	84	304	N.D.			
44) tert-Amyl Methyl Ether	0.00	73	0	N.D.			
45) 1,2-Dichloropropane	0.00	63	0	N.D.			
46) Bromodichloromethane	0.00	83	0	N.D.			
47) Trichloroethene	0.00	130	0	N.D.			
48) 1,4-Dioxane	0.00	88	0	N.D.			
49) 2,2,4-Trimethylpentane...	0.00	57	0	N.D.			
50) Methyl Methacrylate	0.00	100	0	N.D.			

Data File : I:\MS13\DATA\2020 03\12\03122003.D Vial: 1
Acq On : 12 Mar 2020 1:29 Operator: WA
Sample : MB R13031220 1000mL Inst : MS13
Misc : S31-01272001/AC01837

Quant Time: Mar 12 11:38:15 2020
Quant Method : I:\MS13\METHODS\R13031120.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Mar 12 06:29:07 2020
Response via : Initial Calibration
DataAcq Meth:TO15.M

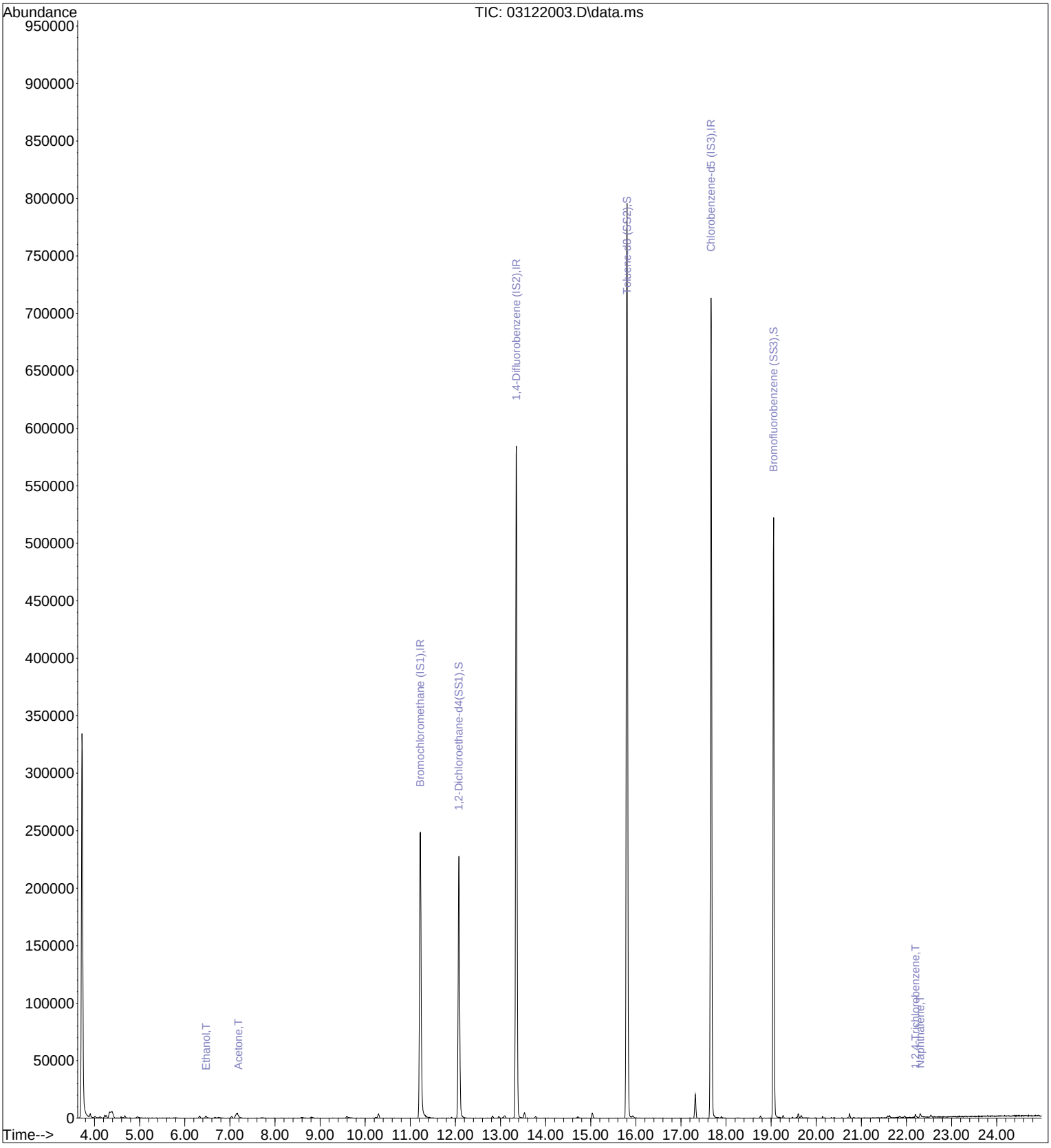
Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
51) n-Heptane	0.00	71	0	N.D.	
52) cis-1,3-Dichloropropene	0.00	75	0	N.D.	
53) 4-Methyl-2-pentanone	0.00	58	0	N.D.	
54) trans-1,3-Dichloropropene	0.00	75	0	N.D.	
55) 1,1,2-Trichloroethane	0.00	97	0	N.D.	
58) Toluene	15.91	91	517	N.D.	
59) 2-Hexanone	0.00	43	0	N.D.	
60) Dibromochloromethane	0.00	129	0	N.D.	
61) 1,2-Dibromoethane	0.00	107	0	N.D.	
62) n-Butyl Acetate	0.00	43	0	N.D.	
63) n-Octane	0.00	57	0	N.D.	
64) Tetrachloroethene	0.00	166	0	N.D.	
65) Chlorobenzene	17.71	112	111	N.D.	
66) Ethylbenzene	17.90	91	703	N.D.	
67) m- & p-Xylenes	18.26	91	476	N.D.	
68) Bromoform	0.00	173	0	N.D.	
69) Styrene	0.00	104	0	N.D.	
70) o-Xylene	0.00	91	0	N.D.	
71) n-Nonane	0.00	43	0	N.D.	
72) 1,1,2,2-Tetrachloroethane	0.00	83	0	N.D.	
74) Cumene	19.19	105	253	N.D.	
75) alpha-Pinene	0.00	93	0	N.D.	
76) n-Propylbenzene	0.00	91	0	N.D. d	
77) 3-Ethyltoluene	19.73	105	801	N.D.	
78) 4-Ethyltoluene	19.77	105	485	N.D.	
79) 1,3,5-Trimethylbenzene	19.83	105	549	N.D.	
80) alpha-Methylstyrene	0.00	118	0	N.D.	
81) 2-Ethyltoluene	20.00	105	269	N.D.	
82) 1,2,4-Trimethylbenzene	20.19	105	314	N.D.	
83) n-Decane	0.00	57	0	N.D.	
84) Benzyl Chloride	20.33	91	135	N.D.	
85) 1,3-Dichlorobenzene	20.34	146	415	N.D.	
86) 1,4-Dichlorobenzene	20.40	146	517	N.D.	
87) sec-Butylbenzene	20.56	105	253	N.D.	
88) 4-Isopropyltoluene (p-...	20.57	119	277	N.D.	
89) 1,2,3-Trimethylbenzene	20.56	105	253	N.D.	
90) 1,2-Dichlorobenzene	20.69	146	315	N.D.	
91) d-Limonene	0.00	68	0	N.D.	
92) 1,2-Dibromo-3-Chloropr...	0.00	157	0	N.D.	
93) n-Undecane	0.00	57	0	N.D.	
94) 1,2,4-Trichlorobenzene	22.20	180	1505	0.078 ng #	93
95) Naphthalene	22.30	128	6397	0.111 ng	87
96) n-Dodecane	22.30	57	345	N.D.	
97) Hexachlorobutadiene	22.61	225	289	N.D.	
98) Cyclohexanone	0.00	55	0	N.D.	
99) tert-Butylbenzene	0.00	119	0	N.D.	
100) n-Butylbenzene	20.95	91	346	N.D.	

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data File : I:\MS13\DATA\2020 03\12\03122003.D Vial: 1
Acq On : 12 Mar 2020 1:29 Operator: WA
Sample : MB R13031220 1000mL Inst : MS13
Misc : S31-01272001/AC01837

Quant Time: Mar 12 11:38:15 2020
Quant Method : I:\MS13\METHODS\R13031120.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Mar 12 06:29:07 2020
Response via : Initial Calibration
DataAcq Meth:TO15.M



Quantitation Report (QT Reviewed)

Data File : I:\MS13\DATA\2020 03\12\03122004.D Vial: 1
Acq On : 12 Mar 2020 2:02 Operator: WA
Sample : LCS R13031220 25ng Inst : MS13
Misc : S31-01272001/S31-03022003 (4/1)

Quant Time: Mar 12 09:03:51 2020
Quant Method : I:\MS13\METHODS\R13031120.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Mar 12 06:29:07 2020
Response via : Initial Calibration
DataAcq Meth:TO15.M

VOA 3/12/20

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.24	130	137507	12.500	ng	-0.01
37) 1,4-Difluorobenzene (IS2)	13.36	114	622105	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	17.67	82	269342	12.500	ng	0.00
System Monitoring Compounds						
33) 1,2-Dichloroethane-d4(...	12.09	65	188140	12.361	ng	-0.02
Spiked Amount 12.500	Range 70 - 130		Recovery = 98.88%			
57) Toluene-d8 (SS2)	15.81	98	688951	12.622	ng	0.00
Spiked Amount 12.500	Range 70 - 130		Recovery = 100.96%			
73) Bromofluorobenzene (SS3)	19.05	174	192021	12.389	ng	0.00
Spiked Amount 12.500	Range 70 - 130		Recovery = 99.12%			
Target Compounds						Qvalue
2) Propene	4.15	42	439746	27.209	ng	100
3) Dichlorodifluoromethan...	4.31	85	658332	26.348	ng	100
4) Chloromethane	4.59	50	371170	21.780	ng	99
5) 1,2-Dichloro-1,1,2,2-t...	4.87	135	377034	25.302	ng	100
6) Vinyl Chloride	5.02	62	569088	28.466	ng	100
7) 1,3-Butadiene	5.29	54	414864	30.674	ng	100
8) Bromomethane	5.73	94	320212	27.406	ng	100
9) Chloroethane	6.06	64	283144	26.981	ng	100
10) Ethanol	6.45	45	1418579	132.002	ng	100
11) Acetonitrile	6.70	41	752008	27.325	ng	100
12) Acrolein	6.88	56	244954	30.858	ng	100
13) Acetone	7.09	58	1408331	130.036	ng	100
14) Trichlorofluoromethane	7.33	101	563241	26.379	ng	100
15) 2-Propanol (Isopropanol)	7.59	45	1927869	58.078	ng	100
16) Acrylonitrile	7.85	53	537896	30.823	ng	100
17) 1,1-Dichloroethene	8.29	96	360389	28.312	ng	100
18) 2-Methyl-2-Propanol (t...	8.46	59	1582581	59.363	ng	100
19) Methylene Chloride	8.52	84	366352	27.217	ng	99
20) 3-Chloro-1-propene (Al...	8.67	41	575864	28.516	ng	100
21) Trichlorotrifluoroethane	8.93	151	322855	27.762	ng	99
22) Carbon Disulfide	8.78	76	1326134	25.074	ng	100
23) trans-1,2-Dichloroethene	9.79	61	529573	30.037	ng	100
24) 1,1-Dichloroethane	10.05	63	630138	27.374	ng	100
25) Methyl tert-Butyl Ether	10.14	73	546620	18.388	ng	100
26) Vinyl Acetate	10.30	86	468309	176.720	ng	99
27) 2-Butanone (MEK)	10.55	72	265090	30.324	ng	100
28) cis-1,2-Dichloroethene	11.06	61	495767	28.273	ng	100
29) Diisopropyl Ether	11.35	87	324252	26.400	ng	99
30) Ethyl Acetate	11.36	61	284295	58.936	ng	100
31) n-Hexane	11.34	57	636845	27.982	ng	100
32) Chloroform	11.41	83	588958	27.497	ng	99
34) Tetrahydrofuran (THF)	11.81	72	259959	28.868	ng	99
35) Ethyl tert-Butyl Ether	11.95	87	442703	30.312	ng	99
36) 1,2-Dichloroethane	12.21	62	430431	27.899	ng	100
38) 1,1,1-Trichloroethane	12.48	97	499765	27.483	ng	99
39) Isopropyl Acetate	12.91	61	487877	59.332	ng	98
40) 1-Butanol	12.93	56	741705	73.883	ng	99
41) Benzene	12.96	78	1469458	25.254	ng	100
42) Carbon Tetrachloride	13.12	117	448992	26.824	ng	100
43) Cyclohexane	13.26	84	1125875	54.501	ng	100
44) tert-Amyl Methyl Ether	13.60	73	1049352	29.739	ng	100
45) 1,2-Dichloropropane	13.81	63	380179	27.829	ng	99
46) Bromodichloromethane	14.01	83	465233	28.236	ng	99
47) Trichloroethene	14.06	130	409775	27.552	ng	100
48) 1,4-Dioxane	14.03	88	321517	31.400	ng	99
49) 2,2,4-Trimethylpentane...	14.13	57	1594224	27.347	ng	100
50) Methyl Methacrylate	14.26	100	328678	58.654	ng	99

Quantitation Report (QT Reviewed)

Data File : I:\MS13\DATA\2020 03\12\03122004.D Vial: 1
Acq On : 12 Mar 2020 2:02 Operator: WA
Sample : LCS R13031220 25ng Inst : MS13
Misc : S31-01272001/S31-03022003 (4/1)

Quant Time: Mar 12 09:03:51 2020
Quant Method : I:\MS13\METHODS\R13031120.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Mar 12 06:29:07 2020
Response via : Initial Calibration
DataAcq Meth:TO15.M

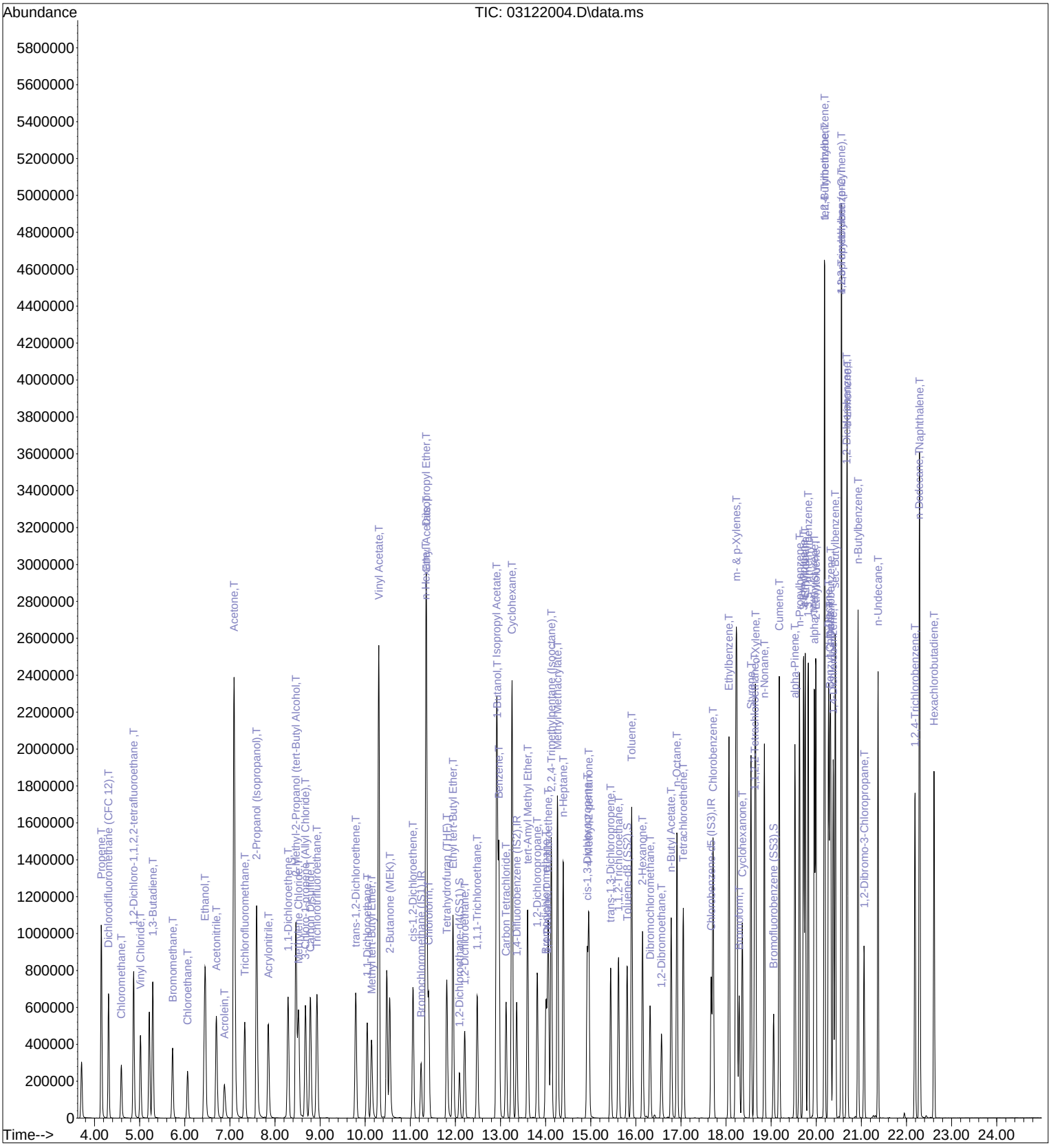
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.39	71	396302	28.312	ng	100
52) cis-1,3-Dichloropropene	14.92	75	641828	29.313	ng	100
53) 4-Methyl-2-pentanone	14.96	58	357062	28.924	ng	100
54) trans-1,3-Dichloropropene	15.44	75	541495	29.629	ng	100
55) 1,1,2-Trichloroethane	15.62	97	357470	28.083	ng	99
58) Toluene	15.91	91	1513889	27.353	ng	100
59) 2-Hexanone	16.15	43	819109	30.010	ng	100
60) Dibromochloromethane	16.32	129	416746	29.305	ng	99
61) 1,2-Dibromoethane	16.57	107	401105	29.944	ng	99
62) n-Butyl Acetate	16.78	43	920117	31.716	ng	100
63) n-Octane	16.91	57	331463	28.856	ng	100
64) Tetrachloroethene	17.05	166	439929	26.721	ng	100
65) Chlorobenzene	17.71	112	1016760	26.829	ng	100
66) Ethylbenzene	18.06	91	1684442	28.554	ng	100
67) m- & p-Xylenes	18.23	91	2594617	56.110	ng	100
68) Bromoform	18.29	173	374657	30.543	ng	100
69) Styrene	18.55	104	1094891	31.237	ng	100
70) o-Xylene	18.66	91	1308469	28.099	ng	100
71) n-Nonane	18.85	43	739798	28.544	ng	100
72) 1,1,2,2-Tetrachloroethane	18.63	83	634097	28.609	ng	100
74) Cumene	19.18	105	1687775	27.901	ng	100
75) alpha-Pinene	19.53	93	856272	30.086	ng	100
76) n-Propylbenzene	19.63	91	2001707	28.412	ng	100
77) 3-Ethyltoluene	19.72	105	1745745	29.260	ng	100
78) 4-Ethyltoluene	19.75	105	1552347	27.160	ng	100
79) 1,3,5-Trimethylbenzene	19.82	105	1399195	27.619	ng	100
80) alpha-Methylstyrene	19.96	118	785424	31.493	ng	100
81) 2-Ethyltoluene	19.99	105	1651071	27.990	ng	100
82) 1,2,4-Trimethylbenzene	20.19	105	1407833	28.696	ng	100
83) n-Decane	20.27	57	775495	28.003	ng	100
84) Benzyl Chloride	20.30	91	1198736	33.384	ng	100
85) 1,3-Dichlorobenzene	20.32	146	866861	28.508	ng	100
86) 1,4-Dichlorobenzene	20.37	146	877933	28.631	ng	100
87) sec-Butylbenzene	20.42	105	1885507	28.131	ng	100
88) 4-Isopropyltoluene (p-...	20.56	119	1743423	28.617	ng	100
89) 1,2,3-Trimethylbenzene	20.56	105	1385352	28.039	ng	100
90) 1,2-Dichlorobenzene	20.68	146	833615	28.744	ng	100
91) d-Limonene	20.69	68	555285	31.464	ng	100
92) 1,2-Dibromo-3-Chloropr...	21.06	157	303786	29.384	ng	99
93) n-Undecane	21.37	57	783915	29.890	ng	99
94) 1,2,4-Trichlorobenzene	22.19	180	637021	31.721	ng	100
95) Naphthalene	22.29	128	1902437	31.744	ng	100
96) n-Dodecane	22.28	57	581418	26.820	ng	100
97) Hexachlorobutadiene	22.61	225	410704	27.276	ng	100
98) Cyclohexanone	18.36	55	503343	31.093	ng	99
99) tert-Butylbenzene	20.19	119	1372795	27.927	ng	100
100) n-Butylbenzene	20.93	91	1484754	29.234	ng	100

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data File : I:\MS13\DATA\2020 03\12\03122004.D Vial: 1
Acq On : 12 Mar 2020 2:02 Operator: WA
Sample : LCS R13031220 25ng Inst : MS13
Misc : S31-01272001/S31-03022003 (4/1)

Quant Time: Mar 12 09:03:51 2020
Quant Method : I:\MS13\METHODS\R13031120.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Mar 12 06:29:07 2020
Response via : Initial Calibration
DataAcq Meth:TO15.M



Response Factor Report MS13

Method Path : I:\MS13\METHODS\
Method File : R13031120.M
Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
Last Update : Thu Mar 12 06:29:07 2020
Response Via : Initial Calibration

Calibration Files
0.1 =03112028.D 0.2 =03112029.D 0.5 =03112030.D 1.0 =03112031.D 5.0 =03112032.D 25 =03112033.D 50 =03112034.D
100 =03112035.D

		Compound	0.1	0.2	0.5	1.0	5.0	25	50	100	Avg	%RSD
1)	IR	Bromochloromethane...	----------	----------	----------	ISTD	----------	----------	----------	----------		
2)	T	Propene	1.450	1.374	1.583	1.456	1.528	1.479	1.404	1.480	1.469	4.50
3)	T	Dichlorodifluo...	2.269	2.202	2.537	2.304	2.336	2.279	2.146	2.099	2.271	5.92
4)	T	Chloromethane	1.293	1.703	1.979	1.784	1.420	1.496	1.170		1.549	18.49
5)	T	1,2-Dichloro-1...	1.409	1.319	1.476	1.342	1.351	1.343	1.292	1.305	1.355	4.46
6)	T	Vinyl Chloride	1.475	1.565	2.055	1.887	1.927	1.939	1.857	1.834	1.817	10.83
7)	T	1,3-Butadiene	0.931	1.016	1.284	1.193	1.310	1.403	1.357	1.343	1.229	13.92
8)	T	Bromomethane	0.852	0.939	1.175	1.107	1.127	1.139	1.069	1.089	1.062	10.38
9)	T	Chloroethane		0.877	1.036	0.942	0.986	0.978	0.933	0.927	0.954	5.34
10)	T	Ethanol	1.046	1.046	1.030	0.950	0.948	0.992	0.915	0.888	0.977	6.21
11)	T	Acetonitrile	2.427	2.504	2.654	2.469	2.568	2.537	2.426	2.430	2.502	3.25
12)	T	Acrolein	0.493	0.537	0.739	0.716	0.800	0.873	0.816	0.800	0.722	18.95
13)	T	Acetone	1.117	1.027	1.089	1.008	1.016	0.956	0.868	0.795	0.985	11.01
14)	T	Trichlorofluor...	1.930	1.917	2.129	1.924	1.952	1.963	1.859	1.853	1.941	4.40
15)	T	2-Propanol (Is...	2.780	2.875	3.154	2.934	3.153	3.363	3.115	2.767	3.018	7.00
16)	T	Acrylonitrile	0.935	1.366	1.642	1.624	1.806	1.841	1.746	1.732	1.586	19.03
17)	T	1,1-Dichloroet...	1.079	0.984	1.274	1.154	1.198	1.218	1.170	1.180	1.157	7.71
18)	T	2-Methyl-2-Pro...	2.256	2.518	2.722	2.611	2.527	2.853	2.253	1.646	2.423	15.51
19)	T	Methylene Chlo...	1.173	1.146	1.318	1.224	1.259	1.253	1.208	1.207	1.224	4.38
20)	T	3-Chloro-1-pro...	1.558	1.662	1.927	1.826	1.946	1.983	1.913	1.872	1.836	8.16
21)	T	Trichlorotrifl...	0.892	1.031	1.168	1.052	1.099	1.092	1.057	1.067	1.057	7.46
22)	T	Carbon Disulfide	6.055	5.047	5.077	4.639	4.583	4.509	4.311	4.242	4.808	12.23
23)	T	trans-1,2-Dich...	1.272	1.358	1.703	1.612	1.727	1.766	1.701	1.683	1.603	11.49
24)	T	1,1-Dichloroet...	1.870	1.974	2.297	2.139	2.165	2.173	2.075	2.048	2.093	6.29
25)	T	Methyl tert-Bu...	2.916	2.978	3.515	3.413	2.784	1.810	1.501		2.702	28.39
26)	T	Vinyl Acetate		0.206	0.179	0.184	0.210	0.316	0.301	0.289	0.241	24.41
27)	T	2-Butanone (MEK)		0.500	0.727	0.804	0.879	0.905	0.874	0.874	0.795	18.05
28)	T	cis-1,2-Dichlo...	1.443	1.479	1.690	1.579	1.662	1.679	1.612	1.608	1.594	5.71
29)	T	Diisopropyl Ether	1.093	0.994	1.305	1.232	1.245	1.087	1.019	0.957	1.116	11.57
30)	T	Ethyl Acetate		0.302	0.477	0.483	0.510	0.471	0.430	0.396	0.439	16.15
31)	T	n-Hexane	2.003	1.974	2.326	2.187	2.215	2.120	1.939	1.788	2.069	8.44
32)	T	Chloroform	1.832	1.825	2.166	1.935	1.999	1.994	1.912	1.914	1.947	5.62
33)	S	1,2-Dichloroet...	1.386	1.390	1.381	1.388	1.394	1.379	1.362	1.389	1.384	0.71
34)	T	Tetrahydrofura...	0.796	0.746	0.880	0.795	0.838	0.849	0.823	0.822	0.819	4.93
35)	T	Ethyl tert-But...	1.015	1.165	1.385	1.332	1.417	1.469	1.418	1.419	1.328	11.81
36)	T	1,2-Dichloroet...	1.335	1.297	1.522	1.380	1.445	1.456	1.392	1.394	1.402	5.07
37)	IR	1,4-Difluorobenzen...	----------	----------	----------	ISTD	----------	----------	----------	----------		
38)	T	1,1,1-Trichlor...	0.361	0.350	0.400	0.368	0.369	0.373	0.358	0.344	0.365	4.65
39)	T	Isopropyl Acetate	0.122	0.154	0.175	0.168	0.183	0.186	0.174	0.159	0.165	12.52
40)	T	1-Butanol		0.175	0.120	0.131	0.160	0.293	0.279	0.255	0.202	35.67
41)	T	Benzene	1.375	1.201	1.292	1.170	1.156	1.136	1.062	0.960	1.169	10.97
42)	T	Carbon Tetrach...	0.320	0.314	0.364	0.330	0.339	0.353	0.340	0.329	0.336	4.92

WDA 3/12/20

00968487

Method Path : I:\MS13\METHODS\
Method File : R13031120.M
Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

43)	T	Cyclohexane	0.405	0.397	0.464	0.429	0.432	0.431	0.400	0.363	0.415	7.31
44)	T	tert-Amyl Meth...	0.622	0.615	0.748	0.686	0.750	0.783	0.749	0.718	0.709	8.80
45)	T	1,2-Dichloropr...	0.266	0.264	0.301	0.269	0.281	0.285	0.271	0.260	0.274	4.98
46)	T	Bromodichlorom...	0.296	0.301	0.358	0.329	0.341	0.353	0.340	0.331	0.331	6.74
47)	T	Trichloroethene	0.298	0.286	0.310	0.289	0.303	0.310	0.300	0.296	0.299	2.94
48)	T	1,4-Dioxane	0.154	0.156	0.214	0.206	0.220	0.240	0.231	0.224	0.206	15.93
49)	T	2,2,4-Trimethy...	1.147	1.131	1.300	1.208	1.216	1.204	1.127	1.037	1.171	6.71
50)	T	Methyl Methacr...			0.101	0.104	0.115	0.123	0.118	0.114	0.113	7.38
51)	T	n-Heptane	0.255	0.261	0.313	0.286	0.292	0.296	0.281	0.267	0.281	6.99
52)	T	cis-1,3-Dichlo...			0.415	0.412	0.446	0.474	0.456	0.438	0.440	5.48
53)	T	4-Methyl-2-pen...			0.224	0.230	0.253	0.273	0.261	0.248	0.248	7.48
54)	T	trans-1,3-Dich...			0.305	0.319	0.376	0.412	0.400	0.391	0.367	12.21
55)	T	1,1,2-Trichlor...	0.225	0.229	0.281	0.266	0.263	0.270	0.259	0.253	0.256	7.65
56)	IR	Chlorobenzene-d5 (...	----------ISTD----------									
57)	S	Toluene-d8 (SS2)	2.533	2.538	2.538	2.519	2.537	2.532	2.533	2.534	2.533	0.24
58)	T	Toluene	2.613	2.594	2.787	2.547	2.608	2.603	2.468	2.328	2.569	5.12
59)	T	2-Hexanone			1.141	1.135	1.311	1.414	1.336	1.264	1.267	8.78
60)	T	Dibromochlorom...	0.548	0.567	0.708	0.647	0.685	0.725	0.703	0.696	0.660	10.19
61)	T	1,2-Dibromoethane	0.497	0.527	0.649	0.624	0.663	0.692	0.668	0.654	0.622	11.38
62)	T	n-Butyl Acetate		0.868	1.267	1.272	1.537	1.576	1.498	1.407	1.346	18.11
63)	T	n-Octane	0.474	0.489	0.581	0.548	0.571	0.567	0.533	0.501	0.533	7.61
64)	T	Tetrachloroethene	0.751	0.713	0.829	0.753	0.758	0.784	0.763	0.761	0.764	4.29
65)	T	Chlorobenzene	1.768	1.653	1.822	1.700	1.734	1.749	2.045	1.601	1.759	7.64
66)	T	Ethylbenzene	2.611	2.534	2.951	2.753	2.890	2.891	2.727	2.545	2.738	5.98
67)	T	m- & p-Xylenes	2.114	2.046	2.351	2.208	2.213	2.216	2.091	1.930	2.146	6.00
68)	T	Bromoform	0.457	0.477	0.564	0.544	0.588	0.645	0.639	0.640	0.569	12.90
69)	T	Styrene	1.229	1.365	1.675	1.603	1.760	1.869	1.797	1.715	1.627	13.62
70)	T	o-Xylene	2.005	2.085	2.364	2.163	2.246	2.262	2.147	2.017	2.161	5.78
71)	T	n-Nonane	1.099	1.110	1.339	1.268	1.309	1.284	1.171	1.042	1.203	9.26
72)	T	1,1,2,2-Tetrac...	0.964	0.977	1.141	1.026	1.055	1.082	1.027	0.957	1.029	6.16
73)	S	Bromofluoroben...	0.717	0.707	0.706	0.720	0.722	0.726	0.729	0.728	0.719	1.25
74)	T	Cumene	2.787	2.740	3.017	2.819	2.905	2.929	2.739	2.525	2.807	5.35
75)	T	alpha-Pinene	1.196	1.186	1.271	1.224	1.382	1.503	1.442	1.363	1.321	9.01
76)	T	n-Propylbenzene	3.041	3.060	3.623	3.385	3.465	3.449	3.221	2.913	3.270	7.62
77)	T	3-Ethyltoluene	2.411	2.526	3.099	2.916	2.775	3.031	2.753	2.639	2.769	8.67
78)	T	4-Ethyltoluene	2.583	2.596	2.829	2.583	2.890	2.723	2.671	2.347	2.653	6.35
79)	T	1,3,5-Trimethy...	2.315	2.329	2.565	2.340	2.381	2.423	2.305	2.152	2.351	4.97
80)	T	alpha-Methylst...	0.973	1.034	1.097	1.059	1.168	1.363	1.311	1.254	1.157	12.13
81)	T	2-Ethyltoluene	2.640	2.658	3.035	2.770	2.804	2.842	2.676	2.475	2.738	6.07
82)	T	1,2,4-Trimethy...	2.142	2.208	2.445	2.297	2.375	2.442	2.274	2.031	2.277	6.39
83)	T	n-Decane	1.192	1.236	1.449	1.334	1.368	1.352	1.246	1.104	1.285	8.61
84)	T	Benzyl Chloride				1.055	1.377	2.009	1.989	1.902	1.666	25.72
85)	T	1,3-Dichlorobe...	1.336	1.315	1.512	1.365	1.421	1.486	1.446	1.408	1.411	4.95
86)	T	1,4-Dichlorobe...	1.364	1.333	1.529	1.406	1.429	1.489	1.440	1.395	1.423	4.47
87)	T	sec-Butylbenzene	3.029	3.015	3.389	3.131	3.220	3.256	3.063	2.783	3.111	5.91
88)	T	4-Isopropyltol...	2.668	2.786	3.120	2.922	2.972	3.031	2.764	2.355	2.827	8.57
89)	T	1,2,3-Trimethy...	2.163	2.198	2.507	2.314	2.396	2.451	2.290	2.024	2.293	7.00
90)	T	1,2-Dichlorobe...	1.361	1.255	1.407	1.316	1.362	1.424	1.370	1.272	1.346	4.48
91)	T	d-Limonene	0.687	0.786	0.794	0.781	0.858	0.967	0.894	0.784	0.819	10.40
92)	T	1,2-Dibromo-3-...			0.399	0.412	0.460	0.542	0.533	0.534	0.480	13.58
93)	T	n-Undecane	1.001	1.055	1.280	1.239	1.349	1.396	1.282	1.135	1.217	11.53
94)	T	1,2,4-Trichlor...	0.708	0.766	0.867	0.881	0.978	1.100	1.084	1.073	0.932	16.13

00968487

Method Path : I:\MS13\METHODS\
Method File : R13031120.M
Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

95)	T	Naphthalene		2.384	2.522	2.460	2.765	3.294	3.170	2.874	2.781	12.71
96)	T	n-Dodecane	0.690	0.887	0.887	0.947	1.121	1.306	1.186	1.025	1.006	19.43
97)	T	Hexachlorobuta...	0.715	0.682	0.718	0.651	0.665	0.724	0.714	0.721	0.699	4.09
98)	T	Cyclohexanone		0.636	0.592	0.591	0.661	0.961	0.931	0.886	0.751	22.21
99)	T	tert-Butylbenzene	2.229	2.263	2.499	2.299	2.364	2.397	2.226	1.972	2.281	6.82
100)	T	n-Butylbenzene	2.067	2.169	2.521	2.384	2.514	2.585	2.417	2.199	2.357	8.07

(#) = Out of Range

Primary Source Standards Concentrations (Working & Initial Calibration)

1ng/L Std. ID: | 40ng/L Std. ID:
4ng/L Std. ID: S34-03102004 | 200ng/L Std. ID: S34-03112002
20ng/L Std. ID: S34-03062003 | 1000ng/L Std. ID:

3/12/20

Dilution Factors:		1	5	25	50	250	1000	Working STD Conc.(ng/L):	4	4	20	20	20	200	200	200
	Source Std.		Primary Working Standards					Injection (L):	0.025	0.050	0.0250	0.050	0.25	0.125	0.25	0.50
Compounds	mg/m³	1000ng/L	200ng/L	40ng/L	20ng/L	4ng/L	1ng/L	ICAL Points:	0.1ng	0.2ng	0.5ng	1ng	5ng	25ng	50ng	100ng
Propene	1.06	1060	212	42.4	21.2	4.24	1.06		0.106	0.212	0.530	1.06	5.30	26.50	53.0	106
Dichlorodifluoromethane	1.06	1060	212	42.4	21.2	4.24	1.06		0.106	0.212	0.530	1.06	5.30	26.50	53.0	106
Chloromethane	1.06	1060	212	42.4	21.2	4.24	1.06		0.106	0.212	0.530	1.06	5.30	26.50	53.0	106
Freon-114	1.05	1050	210	42.0	21.0	4.20	1.05		0.105	0.210	0.525	1.05	5.25	26.25	52.5	105
Vinyl Chloride	1.08	1080	216	43.2	21.6	4.32	1.08		0.108	0.216	0.540	1.08	5.40	27.00	54.0	108
1,3-Butadiene	1.06	1060	212	42.4	21.2	4.24	1.06		0.106	0.212	0.530	1.06	5.30	26.50	53.0	106
Bromomethane	1.08	1080	216	43.2	21.6	4.32	1.08		0.108	0.216	0.540	1.08	5.40	27.00	54.0	108
Chloroethane	1.08	1080	216	43.2	21.6	4.32	1.08		0.108	0.216	0.540	1.08	5.40	27.00	54.0	108
Ethanol	5.21	5210	1042	208.4	104.2	20.84	5.21		0.521	1.042	2.605	5.21	26.05	130.25	260.5	521
Acetonitrile	1.05	1050	210	42.0	21.0	4.20	1.05		0.105	0.210	0.525	1.05	5.25	26.25	52.5	105
Acrolein	1.03	1030	206	41.2	20.6	4.12	1.03		0.103	0.206	0.515	1.03	5.15	25.75	51.5	103
Acetone	5.33	5330	1066	213.2	106.6	21.32	5.33		0.533	1.066	2.665	5.33	26.65	133.25	266.5	533
Trichlorofluoromethane	1.06	1060	212	42.4	21.2	4.24	1.06		0.106	0.212	0.530	1.06	5.30	26.50	53.0	106
Isopropanol	2.10	2100	420	84.0	42.0	8.40	2.10		0.210	0.420	1.050	2.10	10.50	52.50	105.0	210
Acrylonitrile	1.05	1050	210	42.0	21.0	4.20	1.05		0.105	0.210	0.525	1.05	5.25	26.25	52.5	105
1,1-Dichloroethene	1.08	1080	216	43.2	21.6	4.32	1.08		0.108	0.216	0.540	1.08	5.40	27.00	54.0	108
tert-Butanol	2.16	2160	432	86.4	43.2	8.64	2.16		0.216	0.432	1.080	2.16	10.80	54.00	108.0	216
Methylene Chloride	1.06	1060	212	42.4	21.2	4.24	1.06		0.106	0.212	0.530	1.06	5.30	26.50	53.0	106
Allyl Chloride	1.08	1080	216	43.2	21.6	4.32	1.08		0.108	0.216	0.540	1.08	5.40	27.00	54.0	108
Trichlorotrifluoroethane	1.08	1080	216	43.2	21.6	4.32	1.08		0.108	0.216	0.540	1.08	5.40	27.00	54.0	108
Carbon Disulfide	1.07	1070	214	42.8	21.4	4.28	1.07		0.107	0.214	0.535	1.07	5.35	26.75	53.5	107
trans-1,2-Dichloroethene	1.08	1080	216	43.2	21.6	4.32	1.08		0.108	0.216	0.540	1.08	5.40	27.00	54.0	108
1,1-Dichloroethane	1.09	1090	218	43.6	21.8	4.36	1.09		0.109	0.218	0.545	1.09	5.45	27.25	54.5	109
Methyl tert-Butyl Ether	1.08	1080	216	43.2	21.6	4.32	1.08		0.108	0.216	0.540	1.08	5.40	27.00	54.0	108
Vinyl Acetate	5.35	5350	1070	214.0	107.0	21.40	5.35		0.535	1.070	2.675	5.35	26.75	133.75	267.5	535
2-Butanone	1.06	1060	212	42.4	21.2	4.24	1.06		0.106	0.212	0.530	1.06	5.30	26.50	53.0	106
cis-1,2-Dichloroethene	1.06	1060	212	42.4	21.2	4.24	1.06		0.106	0.212	0.530	1.06	5.30	26.50	53.0	106
Diisopropyl Ether	1.08	1080	216	43.2	21.6	4.32	1.08		0.108	0.216	0.540	1.08	5.40	27.00	54.0	108
Ethyl Acetate	2.17	2170	434	86.8	43.4	8.68	2.17		0.217	0.434	1.085	2.17	10.85	54.25	108.5	217
n-Hexane	1.08	1080	216	43.2	21.6	4.32	1.08		0.108	0.216	0.540	1.08	5.40	27.00	54.0	108
Chloroform	1.07	1070	214	42.8	21.4	4.28	1.07		0.107	0.214	0.535	1.07	5.35	26.75	53.5	107
Tetrahydrofuran	1.09	1090	218	43.6	21.8	4.36	1.09		0.109	0.218	0.545	1.09	5.45	27.25	54.5	109
Ethyl tert-Butyl Ether	1.08	1080	216	43.2	21.6	4.32	1.08		0.108	0.216	0.540	1.08	5.40	27.00	54.0	108
1,2-Dichloroethane	1.08	1080	216	43.2	21.6	4.32	1.08		0.108	0.216	0.540	1.08	5.40	27.00	54.0	108
1,1,1-Trichloroethane	1.07	1070	214	42.8	21.4	4.28	1.07		0.107	0.214	0.535	1.07	5.35	26.75	53.5	107
Isopropyl Acetate	2.11	2110	422	84.4	42.2	8.44	2.11		0.211	0.422	1.055	2.11	10.55	52.75	105.5	211
1-Butanol	2.08	2080	416	83.2	41.6	8.32	2.08		0.208	0.416	1.040	2.08	10.40	52.00	104.0	208
Benzene	1.06	1060	212	42.4	21.2	4.24	1.06		0.106	0.212	0.530	1.06	5.30	26.50	53.0	106
Carbon Tetrachloride	1.05	1050	210	42.0	21.0	4.20	1.05		0.105	0.210	0.525	1.05	5.25	26.25	52.5	105
Cyclohexane	2.12	2120	424	84.8	42.4	8.48	2.12		0.212	0.424	1.060	2.12	10.60	53.00	106.0	212
tert-Amyl Methyl Ether	1.08	1080	216	43.2	21.6	4.32	1.08		0.108	0.216	0.540	1.08	5.40	27.00	54.0	108
1,2-Dichloropropane	1.08	1080	216	43.2	21.6	4.32	1.08		0.108	0.216	0.540	1.08	5.40	27.00	54.0	108
Bromodichloromethane	1.08	1080	216	43.2	21.6	4.32	1.08		0.108	0.216	0.540	1.08	5.40	27.00	54.0	108
Trichloroethene	1.07	1070	214	42.8	21.4	4.28	1.07		0.107	0.214	0.535	1.07	5.35	26.75	53.5	107
1,4-Dioxane	1.08	1080	216	43.2	21.6	4.32	1.08		0.108	0.216	0.540	1.08	5.40	27.00	54.0	108
Isooctane	1.07	1070	214	42.8	21.4	4.28	1.07		0.107	0.214	0.535	1.07	5.35	26.75	53.5	107
Methyl Methacrylate	2.15	2150	430	86.0	43.0	8.60	2.15		0.215	0.430	1.075	2.15	10.75	53.75	107.5	215
n-Heptane	1.08	1080	216	43.2	21.6	4.32	1.08		0.108	0.216	0.540	1.08	5.40	27.00	54.0	108

Date Updated: 03/10/20
Version: 2

Q:\TO15 Std. Concentrations\MS13 Std. Conc\2020\R13031120.M\ICAL Conc. (Primary Source)

Primary Source Standards Concentrations (Working & Initial Calibration)

1ng/L Std. ID:
4ng/L Std. ID: S34-03102004
20ng/L Std. ID: S34-03062003
40ng/L Std. ID:
200ng/L Std. ID: S34-03112002
1000ng/L Std. ID:

Dilution Factors:		1	5	25	50	250	1000	Working STD Conc.(ng/L):	4	4	20	20	20	200	200	200
	Source Std.			Primary Working Standards				Injection (L):	0.025	0.050	0.0250	0.050	0.25	0.125	0.25	0.50
Compounds	mg/m³	1000ng/L	200ng/L	40ng/L	20ng/L	4ng/L	1ng/L	ICAL Points:	0.1ng	0.2ng	0.5ng	1ng	5ng	25ng	50ng	100ng
cis-1,3-Dichloropropene	1.04	1040	208	41.6	20.8	4.16	1.04		0.104	0.208	0.520	1.04	5.20	26.00	52.0	104
4-Methyl-2-pentanone	1.06	1060	212	42.4	21.2	4.24	1.06		0.106	0.212	0.530	1.06	5.30	26.50	53.0	106
trans-1,3-Dichloropropene	1.06	1060	212	42.4	21.2	4.24	1.06		0.106	0.212	0.530	1.06	5.30	26.50	53.0	106
1,1,2-Trichloroethane	1.07	1070	214	42.8	21.4	4.28	1.07		0.107	0.214	0.535	1.07	5.35	26.75	53.5	107
Toluene	1.07	1070	214	42.8	21.4	4.28	1.07		0.107	0.214	0.535	1.07	5.35	26.75	53.5	107
2-Hexanone	1.07	1070	214	42.8	21.4	4.28	1.07		0.107	0.214	0.535	1.07	5.35	26.75	53.5	107
Dibromochloromethane	1.07	1070	214	42.8	21.4	4.28	1.07		0.107	0.214	0.535	1.07	5.35	26.75	53.5	107
1,2-Dibromoethane	1.07	1070	214	42.8	21.4	4.28	1.07		0.107	0.214	0.535	1.07	5.35	26.75	53.5	107
n-Butyl Acetate	1.09	1090	218	43.6	21.8	4.36	1.09		0.109	0.218	0.545	1.09	5.45	27.25	54.5	109
n-Octane	1.08	1080	216	43.2	21.6	4.32	1.08		0.108	0.216	0.540	1.08	5.40	27.00	54.0	108
Tetrachloroethene	1.04	1040	208	41.6	20.8	4.16	1.04		0.104	0.208	0.520	1.04	5.20	26.00	52.0	104
Chlorobenzene	1.07	1070	214	42.8	21.4	4.28	1.07		0.107	0.214	0.535	1.07	5.35	26.75	53.5	107
Ethylbenzene	1.07	1070	214	42.8	21.4	4.28	1.07		0.107	0.214	0.535	1.07	5.35	26.75	53.5	107
m-&p-Xylene	2.14	2140	428	85.6	42.8	8.56	2.14		0.214	0.428	1.070	2.14	10.70	53.50	107.0	214
Bromoform	1.07	1070	214	42.8	21.4	4.28	1.07		0.107	0.214	0.535	1.07	5.35	26.75	53.5	107
Styrene	1.06	1060	212	42.4	21.2	4.24	1.06		0.106	0.212	0.530	1.06	5.30	26.50	53.0	106
o-Xylene	1.07	1070	214	42.8	21.4	4.28	1.07		0.107	0.214	0.535	1.07	5.35	26.75	53.5	107
n-Nonane	1.07	1070	214	42.8	21.4	4.28	1.07		0.107	0.214	0.535	1.07	5.35	26.75	53.5	107
1,1,2,2-Tetrachloroethane	1.07	1070	214	42.8	21.4	4.28	1.07		0.107	0.214	0.535	1.07	5.35	26.75	53.5	107
Cumene	1.08	1080	216	43.2	21.6	4.32	1.08		0.108	0.216	0.540	1.08	5.40	27.00	54.0	108
alpha-Pinene	1.07	1070	214	42.8	21.4	4.28	1.07		0.107	0.214	0.535	1.07	5.35	26.75	53.5	107
n-Propylbenzene	1.08	1080	216	43.2	21.6	4.32	1.08		0.108	0.216	0.540	1.08	5.40	27.00	54.0	108
3-Ethyltoluene	1.06	1060	212	42.4	21.2	4.24	1.06		0.106	0.212	0.530	1.06	5.30	26.50	53.0	106
4-Ethyltoluene	1.08	1080	216	43.2	21.6	4.32	1.08		0.108	0.216	0.540	1.08	5.40	27.00	54.0	108
1,3,5-Trimethylbenzene	1.06	1060	212	42.4	21.2	4.24	1.06		0.106	0.212	0.530	1.06	5.30	26.50	53.0	106
alpha-Methylstyrene	1.07	1070	214	42.8	21.4	4.28	1.07		0.107	0.214	0.535	1.07	5.35	26.75	53.5	107
2-Ethyltoluene	1.08	1080	216	43.2	21.6	4.32	1.08		0.108	0.216	0.540	1.08	5.40	27.00	54.0	108
1,2,4-Trimethylbenzene	1.07	1070	214	42.8	21.4	4.28	1.07		0.107	0.214	0.535	1.07	5.35	26.75	53.5	107
n-Decane	1.07	1070	214	42.8	21.4	4.28	1.07		0.107	0.214	0.535	1.07	5.35	26.75	53.5	107
Benzyl Chloride	1.08	1080	216	43.2	21.6	4.32	1.08		0.108	0.216	0.540	1.08	5.40	27.00	54.0	108
1,3-Dichlorobenzene	1.07	1070	214	42.8	21.4	4.28	1.07		0.107	0.214	0.535	1.07	5.35	26.75	53.5	107
1,4-Dichlorobenzene	1.07	1070	214	42.8	21.4	4.28	1.07		0.107	0.214	0.535	1.07	5.35	26.75	53.5	107
sec-Butylbenzene	1.07	1070	214	42.8	21.4	4.28	1.07		0.107	0.214	0.535	1.07	5.35	26.75	53.5	107
p-Isopropyltoluene	1.09	1090	218	43.6	21.8	4.36	1.09		0.109	0.218	0.545	1.09	5.45	27.25	54.5	109
1,2,3-Trimethylbenzene	1.09	1090	218	43.6	21.8	4.36	1.09		0.109	0.218	0.545	1.09	5.45	27.25	54.5	109
1,2-Dichlorobenzene	1.07	1070	214	42.8	21.4	4.28	1.07		0.107	0.214	0.535	1.07	5.35	26.75	53.5	107
d-Limonene	1.08	1080	216	43.2	21.6	4.32	1.08		0.108	0.216	0.540	1.08	5.40	27.00	54.0	108
1,2-Dibromo-3-chloropropane	1.05	1050	210	42.0	21.0	4.20	1.05		0.105	0.210	0.525	1.05	5.25	26.25	52.5	105
n-Undecane	1.08	1080	216	43.2	21.6	4.32	1.08		0.108	0.216	0.540	1.08	5.40	27.00	54.0	108
1,2,4-Trichlorobenzene	1.07	1070	214	42.8	21.4	4.28	1.07		0.107	0.214	0.535	1.07	5.35	26.75	53.5	107
Naphthalene	1.03	1030	206	41.2	20.6	4.12	1.03		0.103	0.206	0.515	1.03	5.15	25.75	51.5	103
n-Dodecane	1.04	1040	208	41.6	20.8	4.16	1.04		0.104	0.208	0.520	1.04	5.20	26.00	52.0	104
Hexachloro-1,3-butadiene	1.06	1060	212	42.4	21.2	4.24	1.06		0.106	0.212	0.530	1.06	5.30	26.50	53.0	106
Methacrylonitrile	1.06	1060	212	42.4	21.2	4.24	1.06		0.106	0.212	0.530	1.06	5.30	26.50	53.0	106
Cyclohexanone	1.00	1000	200	40.0	20.0	4.00	1.00		0.100	0.200	0.500	1.00	5.00	25.00	50.0	100
tert-Butylbenzene	1.07	1070	214	42.8	21.4	4.28	1.07		0.107	0.214	0.535	1.07	5.35	26.75	53.5	107
n-Butylbenzene	1.07	1070	214	42.8	21.4	4.28	1.07		0.107	0.214	0.535	1.07	5.35	26.75	53.5	107

Q:\TO15 Std. Concentrations\MS13 Std. Conc\2020\R13031120.M\ICAL Conc. (Primary Source)

Calibration Status Report MS13

Method : I:\MS13\METHODS\R13031120.M (RTE Integrator)
Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
Last Update : Thu Mar 12 06:29:07 2020
Response via : Initial Calibration

#	ID	Conc	ISTD Conc	Path\File
1	0.1	0	13	I:\MS13\DATA\2020_03\11\03112028.D
2	0.2	0	13	I:\MS13\DATA\2020_03\11\03112029.D
3	0.5	1	13	I:\MS13\DATA\2020_03\11\03112030.D
4	1.0	1	13	I:\MS13\DATA\2020_03\11\03112031.D
5	5.0	5	13	I:\MS13\DATA\2020_03\11\03112032.D
6	25	27	13	I:\MS13\DATA\2020_03\11\03112033.D
7	50	53	13	I:\MS13\DATA\2020_03\11\03112034.D
8	100	106	13	I:\MS13\DATA\2020_03\11\03112035.D

3/12/20

#	ID	Update Time	Quant Time	Acquisition Time
1	0.1	Mar 12 06:27 2020	Mar 12 06:20 2020	11 Mar 2020 18:10
2	0.2	Mar 12 06:28 2020	Mar 12 06:16 2020	11 Mar 2020 18:43
3	0.5	Mar 12 06:28 2020	Mar 12 06:16 2020	11 Mar 2020 19:17
4	1.0	Mar 12 06:28 2020	Mar 12 06:16 2020	11 Mar 2020 19:51
5	5.0	Mar 12 06:28 2020	Mar 12 06:16 2020	11 Mar 2020 20:25
6	25	Mar 12 06:28 2020	Mar 12 06:16 2020	11 Mar 2020 20:59
7	50	Mar 12 06:28 2020	Mar 12 06:16 2020	11 Mar 2020 21:33
8	100	Mar 12 06:29 2020	Mar 12 06:16 2020	11 Mar 2020 22:07

R13031120.M Thu Mar 12 15:43:38 2020

Quantitation Report (QT Reviewed)

Data File : I:\MS13\DATA\2020 03\11\03112028.D Vial: 14
Acq On : 11 Mar 2020 18:10 Operator: WA
Sample : 0.1ng R13031120 ICAL Std Inst : MS13
Misc : S31-01272001/S34-03102004 (4/8)

Quant Time: Mar 12 06:20:51 2020
Quant Method : I:\MS13\METHODS\R13031120.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Mar 12 06:15:40 2020 3/12/20
Response via : Initial Calibration
DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units		Dev(Min)
1) Bromochloromethane (IS1)	11.22	130	143313	12.500	ng		-0.02
37) 1,4-Difluorobenzene (IS2)	13.35	114	644261	12.500	ng		0.00
56) Chlorobenzene-d5 (IS3)	17.67	82	281687	12.500	ng		0.00
System Monitoring Compounds							
33) 1,2-Dichloroethane-d4(...	12.08	65	198672	11.917	ng		-0.01
Spiked Amount 12.500	Range 70 - 130		Recovery = 95.36%				
57) Toluene-d8 (SS2)	15.80	98	713593	12.619	ng		0.00
Spiked Amount 12.500	Range 70 - 130		Recovery = 100.96%				
73) Bromofluorobenzene (SS3)	19.05	174	201923	13.701	ng		0.00
Spiked Amount 12.500	Range 70 - 130		Recovery = 109.60%				
Target Compounds							Qvalue
2) Propene	4.22	42	1762	0.081	ng		97
3) Dichlorodifluoromethan...	4.37	85	2757	0.091	ng	#	88
4) Chloromethane	4.67	50	1571	0.068	ng	#	56
5) 1,2-Dichloro-1,1,2,2-t...	4.91	135	1696	0.104	ng		97
6) Vinyl Chloride	5.08	62	1826	0.070	ng		79
7) 1,3-Butadiene	5.36	54	1131	0.063	ng		96
8) Bromomethane	5.79	94	1055	0.076	ng		93
9) Chloroethane	0.00	64	0	N.D.	d		
10) Ethanol	6.45	45	6248	0.450	ng		92
11) Acetonitrile	6.73	41	2922	0.083	ng	#	46
12) Acrolein	6.93	56	582	0.055	ng	#	75
13) Acetone	7.14	58	6825	0.518	ng		93
14) Trichlorofluoromethane	7.34	101	2345	0.093	ng		97
15) 2-Propanol (Isopropanol)	7.67	45	6693	0.156	ng		95
16) Acrylonitrile	7.89	53	1125	0.049	ng	#	72
17) 1,1-Dichloroethene	8.30	96	1336	0.089	ng		94
18) 2-Methyl-2-Propanol (t...	8.55	59	5588	0.161	ng		86
19) Methylene Chloride	8.51	84	1426	0.088	ng		96
20) 3-Chloro-1-propene (Al...	8.69	41	1929	0.072	ng		74
21) Trichlorotrifluoroethane	8.94	151	1104	0.085	ng		89
22) Carbon Disulfide	8.82	76	7428	0.123	ng		84
23) trans-1,2-Dichloroethene	9.80	61	1575	0.071	ng		94
24) 1,1-Dichloroethane	10.04	63	2337	0.081	ng		95
25) Methyl tert-Butyl Ether	10.20	73	3611	0.098	ng		83
26) Vinyl Acetate	10.33	86	867	0.246	ng	#	1
27) 2-Butanone (MEK)	0.00	72	0	N.D.	d		
28) cis-1,2-Dichloroethene	11.05	61	1754	0.079	ng		96
29) Diisopropyl Ether	11.38	87	1353	0.093	ng	#	1
30) Ethyl Acetate	0.00	61	0	N.D.	d		
31) n-Hexane	11.34	57	2480	0.087	ng	#	93
32) Chloroform	11.40	83	2247	0.086	ng		98
34) Tetrahydrofuran (THF)	11.88	72	995	0.090	ng	#	81
35) Ethyl tert-Butyl Ether	11.98	87	1257	0.070	ng	#	80
36) 1,2-Dichloroethane	12.20	62	1653	0.087	ng		83
38) 1,1,1-Trichloroethane	12.48	97	1991	0.093	ng		96
39) Isopropyl Acetate	12.94	61	1324	0.129	ng	#	61
40) 1-Butanol	13.04	56	941	0.062	ng	#	78
41) Benzene	12.96	78	7514	0.109	ng		92
42) Carbon Tetrachloride	13.12	117	1733	0.090	ng		99
43) Cyclohexane	13.25	84	4427	0.179	ng		95
44) tert-Amyl Methyl Ether	13.63	73	3463	0.080	ng		96
45) 1,2-Dichloropropane	13.82	63	1478	0.089	ng		95
46) Bromodichloromethane	14.00	83	1649	0.085	ng		97
47) Trichloroethene	14.06	130	1641	0.099	ng		87
48) 1,4-Dioxane	14.11	88	859	0.072	ng		78
49) 2,2,4-Trimethylpentane...	14.13	57	6326	0.086	ng		99
50) Methyl Methacrylate	14.29	100	467	0.080	ng	#	1

Quantitation Report (QT Reviewed)

Data File : I:\MS13\DATA\2020 03\11\03112028.D Vial: 14
Acq On : 11 Mar 2020 18:10 Operator: WA
Sample : 0.1ng R13031120 ICAL Std Inst : MS13
Misc : S31-01272001/S34-03102004 (4/8)

Quant Time: Mar 12 06:20:51 2020
Quant Method : I:\MS13\METHODS\R13031120.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Mar 12 06:15:40 2020
Response via : Initial Calibration
DataAcq Meth:TO15.M

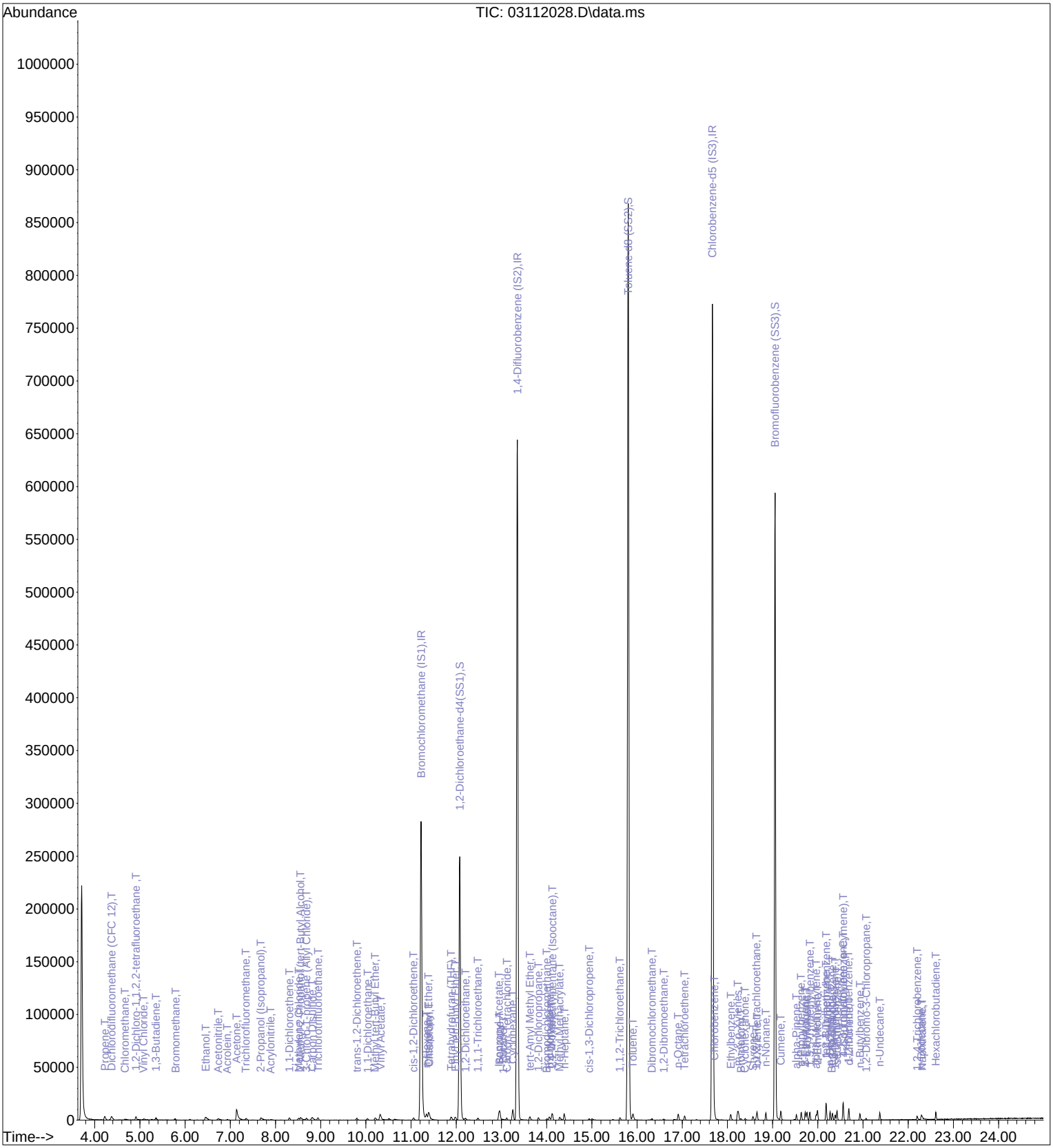
Internal Standards	R.T.	QIon	Response	Conc Units		Dev(Min)
51) n-Heptane	14.39	71	1417	0.084 ng		93
52) cis-1,3-Dichloropropene	14.94	75	1474	0.060 ng		84
53) 4-Methyl-2-pentanone	0.00	58	0	N.D. d		
54) trans-1,3-Dichloropropene	0.00	75	0	N.D. d		
55) 1,1,2-Trichloroethane	15.62	97	1243	0.083 ng		94
58) Toluene	15.91	91	6301	0.099 ng		98
59) 2-Hexanone	0.00	43	0	N.D. d		
60) Dibromochloromethane	16.33	129	1321	0.085 ng		98
61) 1,2-Dibromoethane	16.59	107	1199	0.079 ng		97
62) n-Butyl Acetate	0.00	43	0	N.D. d		
63) n-Octane	16.91	57	1154	0.081 ng		95
64) Tetrachloroethene	17.05	166	1761	0.099 ng		97
65) Chlorobenzene	17.71	112	4262	0.100 ng		99
66) Ethylbenzene	18.08	91	6295	0.092 ng		96
67) m- & p-Xylenes	18.23	91	10194	0.191 ng		94
68) Bromoform	18.30	173	1101	0.084 ng		80
69) Styrene	18.56	104	2935	0.072 ng		93
70) o-Xylene	18.66	91	4835	0.089 ng		97
71) n-Nonane	18.85	43	2651	0.081 ng		97
72) 1,1,2,2-Tetrachloroethane	18.64	83	2325	0.092 ng		93
74) Cumene	19.18	105	6783	0.098 ng		97
75) alpha-Pinene	19.53	93	2885	0.086 ng		91
76) n-Propylbenzene	19.63	91	7402	0.091 ng		94
77) 3-Ethyltoluene	19.72	105	5760	0.085 ng		100
78) 4-Ethyltoluene	19.75	105	6286	0.096 ng		100
79) 1,3,5-Trimethylbenzene	19.82	105	5529	0.096 ng		97
80) alpha-Methylstyrene	19.96	118	2347	0.082 ng		94
81) 2-Ethyltoluene	19.99	105	6424	0.096 ng		96
82) 1,2,4-Trimethylbenzene	20.19	105	5166	0.094 ng		97
83) n-Decane	20.27	57	2874	0.089 ng		94
84) Benzyl Chloride	20.31	91	1656	0.038 ng		74
85) 1,3-Dichlorobenzene	20.32	146	3222	0.095 ng		94
86) 1,4-Dichlorobenzene	20.39	146	3290	0.095 ng		95
87) sec-Butylbenzene	20.43	105	7303	0.096 ng		98
88) 4-Isopropyltoluene (p-...	20.56	119	6554	0.098 ng		97
89) 1,2,3-Trimethylbenzene	20.56	105	5313	0.097 ng		95
90) 1,2-Dichlorobenzene	20.68	146	3282	0.102 ng		92
91) d-Limonene	20.69	68	1673	0.079 ng		98
92) 1,2-Dibromo-3-Chloropr...	21.07	157	738	0.064 ng		96
93) n-Undecane	21.37	57	2437	0.071 ng		88
94) 1,2,4-Trichlorobenzene	22.20	180	1706	0.070 ng	#	95
95) Naphthalene	22.31	128	4550	0.067 ng		89
96) n-Dodecane	22.29	57	1616	0.052 ng		87
97) Hexachlorobutadiene	22.61	225	1708	0.107 ng		95
98) Cyclohexanone	18.39	55	1189	0.059 ng		94
99) tert-Butylbenzene	20.18	119	5374	0.099 ng		93
100) n-Butylbenzene	20.93	91	4983	0.085 ng		91

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data File : I:\MS13\DATA\2020 03\11\03112028.D Vial: 14
Acq On : 11 Mar 2020 18:10 Operator: WA
Sample : 0.1ng R13031120 ICAL Std Inst : MS13
Misc : S31-01272001/S34-03102004 (4/8)

Quant Time: Mar 12 06:20:51 2020
Quant Method : I:\MS13\METHODS\R13031120.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Mar 12 06:15:40 2020
Response via : Initial Calibration
DataAcq Meth:TO15.M



Quantitation Report (QT Reviewed)

Data File : I:\MS13\DATA\2020 03\11\03112029.D Vial: 14
Acq On : 11 Mar 2020 18:43 Operator: WA
Sample : 0.2ng R13031120 ICAL Std Inst : MS13
Misc : S31-01272001/S34-03102004 (4/8)

Quant Time: Mar 12 06:16:09 2020
Quant Method : I:\MS13\METHODS\R13031120.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Mar 12 06:15:40 2020
Response via : Initial Calibration
DataAcq Meth:TO15.M

WA 3/12/20

Internal Standards	R.T.	QIon	Response	Conc	Units		Dev(Min)
1) Bromochloromethane (IS1)	11.22	130	143501	12.500	ng		-0.02
37) 1,4-Difluorobenzene (IS2)	13.35	114	643329	12.500	ng		0.00
56) Chlorobenzene-d5 (IS3)	17.67	82	282241	12.500	ng		0.00
System Monitoring Compounds							
33) 1,2-Dichloroethane-d4(...	12.08	65	199405	11.945	ng		-0.01
Spiked Amount 12.500	Range 70 - 130		Recovery = 95.60%				
57) Toluene-d8 (SS2)	15.80	98	716190	12.640	ng		0.00
Spiked Amount 12.500	Range 70 - 130		Recovery = 101.12%				
73) Bromofluorobenzene (SS3)	19.05	174	199514	13.511	ng		0.00
Spiked Amount 12.500	Range 70 - 130		Recovery = 108.08%				
Target Compounds							Qvalue
2) Propene	4.22	42	3345	0.154	ng		94
3) Dichlorodifluoromethan...	4.37	85	5359	0.176	ng		96
4) Chloromethane	4.66	50	4144	0.178	ng		86
5) 1,2-Dichloro-1,1,2,2-t...	4.91	135	3181	0.195	ng		94
6) Vinyl Chloride	5.09	62	3881	0.149	ng		89
7) 1,3-Butadiene	5.35	54	2472	0.137	ng		97
8) Bromomethane	5.77	94	2328	0.167	ng		98
9) Chloroethane	6.10	64	2174	0.173	ng		85
10) Ethanol	6.45	45	12512	0.900	ng		98
11) Acetonitrile	6.72	41	6037	0.171	ng	#	62
12) Acrolein	6.92	56	1269	0.120	ng		99
13) Acetone	7.13	58	12567	0.953	ng		94
14) Trichlorofluoromethane	7.36	101	4666	0.186	ng		99
15) 2-Propanol (Isopropanol)	7.66	45	13863	0.322	ng		93
16) Acrylonitrile	7.88	53	3292	0.144	ng		88
17) 1,1-Dichloroethene	8.30	96	2441	0.163	ng		92
18) 2-Methyl-2-Propanol (t...	8.54	59	12489	0.359	ng		95
19) Methylene Chloride	8.51	84	2790	0.172	ng		99
20) 3-Chloro-1-propene (Al...	8.69	41	4121	0.153	ng		89
21) Trichlorotrifluoroethane	8.95	151	2556	0.197	ng		100
22) Carbon Disulfide	8.81	76	12398	0.204	ng		95
23) trans-1,2-Dichloroethene	9.79	61	3368	0.152	ng		99
24) 1,1-Dichloroethane	10.03	63	4941	0.171	ng		96
25) Methyl tert-Butyl Ether	10.19	73	7384	0.200	ng		95
26) Vinyl Acetate	10.31	86	2535	0.719	ng	#	48
27) 2-Butanone (MEK)	10.62	72	1217	0.113	ng	#	1
28) cis-1,2-Dichloroethene	11.05	61	3599	0.162	ng		98
29) Diisopropyl Ether	11.38	87	2466	0.170	ng	#	94
30) Ethyl Acetate	11.39	61	1507	0.271	ng		87
31) n-Hexane	11.34	57	4896	0.171	ng		98
32) Chloroform	11.39	83	4483	0.172	ng		100
34) Tetrahydrofuran (THF)	11.88	72	1867	0.168	ng	#	87
35) Ethyl tert-Butyl Ether	11.97	87	2889	0.161	ng		96
36) 1,2-Dichloroethane	12.21	62	3215	0.170	ng		95
38) 1,1,1-Trichloroethane	12.48	97	3857	0.180	ng		97
39) Isopropyl Acetate	12.93	61	3348	0.328	ng		98
40) 1-Butanol	12.99	56	3741	0.246	ng	#	77
41) Benzene	12.96	78	13100	0.191	ng		98
42) Carbon Tetrachloride	13.12	117	3395	0.176	ng		100
43) Cyclohexane	13.25	84	8658	0.352	ng		95
44) tert-Amyl Methyl Ether	13.62	73	6840	0.159	ng		94
45) 1,2-Dichloropropane	13.82	63	2932	0.176	ng		94
46) Bromodichloromethane	14.00	83	3349	0.173	ng		96
47) Trichloroethene	14.06	130	3145	0.190	ng		100
48) 1,4-Dioxane	14.09	88	1737	0.146	ng	#	71
49) 2,2,4-Trimethylpentane...	14.13	57	12462	0.170	ng		99
50) Methyl Methacrylate	14.28	100	1549	0.266	ng	#	68

Data File : I:\MS13\DATA\2020 03\11\03112029.D Vial: 14
Acq On : 11 Mar 2020 18:43 Operator: WA
Sample : 0.2ng R13031120 ICAL Std Inst : MS13
Misc : S31-01272001/S34-03102004 (4/8)

Quant Time: Mar 12 06:16:09 2020
Quant Method : I:\MS13\METHODS\R13031120.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Mar 12 06:15:40 2020
Response via : Initial Calibration
DataAcq Meth:TO15.M

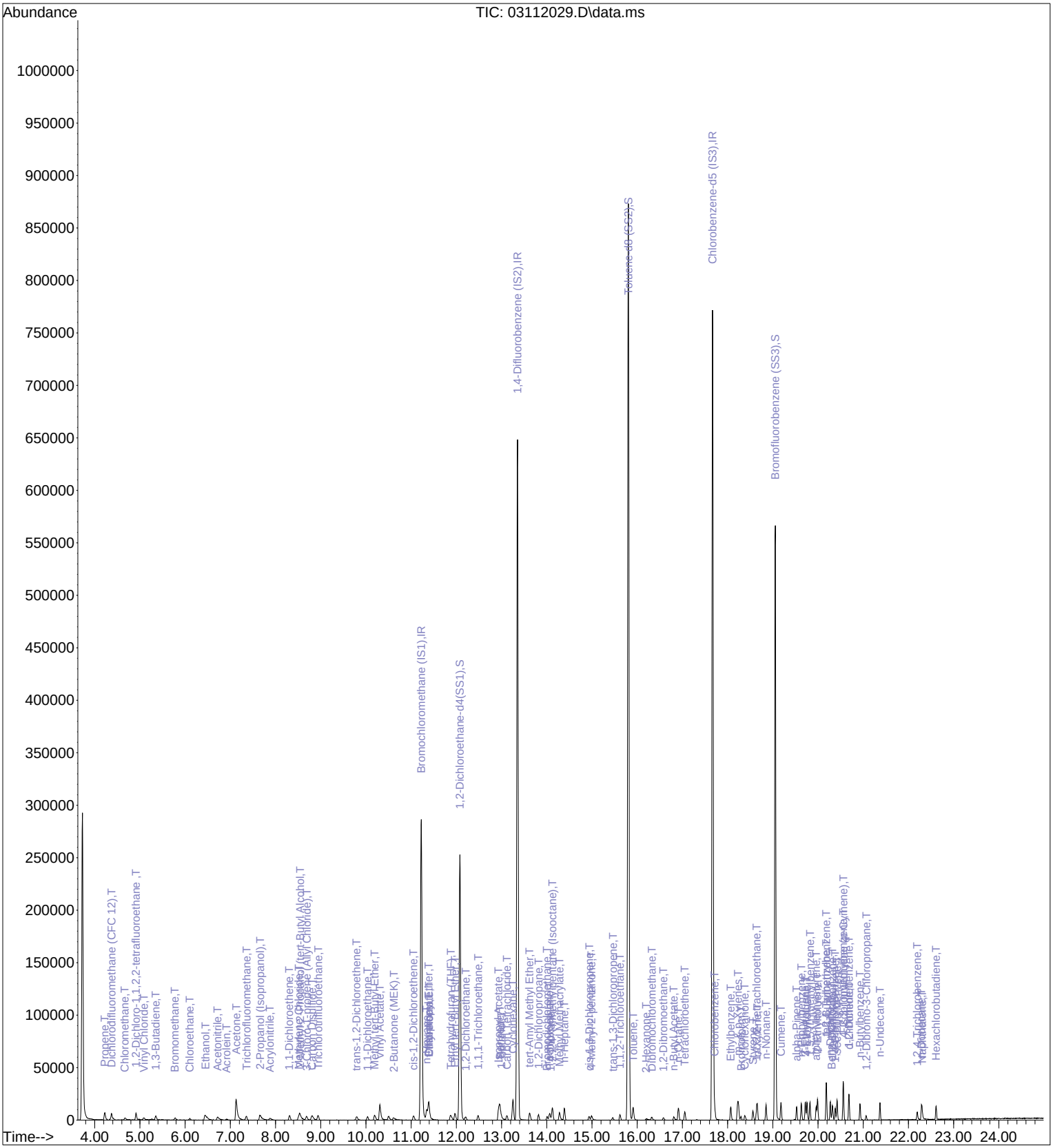
Internal Standards	R.T.	QIon	Response	Conc	Units		Dev(Min)
51) n-Heptane	14.39	71	2897	0.171	ng		98
52) cis-1,3-Dichloropropene	14.94	75	3655	0.148	ng		93
53) 4-Methyl-2-pentanone	14.99	58	1734	0.118	ng	#	67
54) trans-1,3-Dichloropropene	15.46	75	2352	0.112	ng		89
55) 1,1,2-Trichloroethane	15.62	97	2517	0.168	ng		98
58) Toluene	15.91	91	12532	0.196	ng		95
59) 2-Hexanone	16.20	43	4068	0.126	ng		77
60) Dibromochloromethane	16.32	129	2742	0.175	ng		99
61) 1,2-Dibromoethane	16.58	107	2546	0.166	ng		97
62) n-Butyl Acetate	16.81	43	4272	0.120	ng		89
63) n-Octane	16.91	57	2386	0.168	ng		93
64) Tetrachloroethene	17.05	166	3350	0.188	ng		98
65) Chlorobenzene	17.71	112	7985	0.187	ng		99
66) Ethylbenzene	18.07	91	12243	0.179	ng		97
67) m- & p-Xylenes	18.23	91	19768	0.369	ng		95
68) Bromoform	18.30	173	2307	0.175	ng		91
69) Styrene	18.56	104	6532	0.160	ng		96
70) o-Xylene	18.66	91	10076	0.184	ng		92
71) n-Nonane	18.85	43	5364	0.164	ng		96
72) 1,1,2,2-Tetrachloroethane	18.64	83	4720	0.187	ng		96
74) Cumene	19.18	105	13362	0.193	ng		97
75) alpha-Pinene	19.53	93	5729	0.170	ng		100
76) n-Propylbenzene	19.63	91	14925	0.182	ng		98
77) 3-Ethyltoluene	19.72	105	12092	0.177	ng		99
78) 4-Ethyltoluene	19.75	105	12661	0.194	ng		96
79) 1,3,5-Trimethylbenzene	19.82	105	11147	0.193	ng		94
80) alpha-Methylstyrene	19.96	118	4995	0.174	ng		94
81) 2-Ethyltoluene	19.99	105	12965	0.193	ng		98
82) 1,2,4-Trimethylbenzene	20.18	105	10669	0.194	ng		100
83) n-Decane	20.27	57	5974	0.185	ng		95
84) Benzyl Chloride	20.30	91	4406	0.100	ng		87
85) 1,3-Dichlorobenzene	20.32	146	6353	0.188	ng		96
86) 1,4-Dichlorobenzene	20.38	146	6443	0.187	ng		99
87) sec-Butylbenzene	20.42	105	14566	0.191	ng		97
88) 4-Isopropyltoluene (p-...	20.56	119	13712	0.204	ng		97
89) 1,2,3-Trimethylbenzene	20.56	105	10818	0.197	ng		100
90) 1,2-Dichlorobenzene	20.68	146	6066	0.189	ng		98
91) d-Limonene	20.69	68	3835	0.181	ng		95
92) 1,2-Dibromo-3-Chloropr...	21.07	157	1598	0.137	ng		81
93) n-Undecane	21.37	57	5145	0.150	ng		98
94) 1,2,4-Trichlorobenzene	22.20	180	3701	0.152	ng		99
95) Naphthalene	22.30	128	11091	0.163	ng		91
96) n-Dodecane	22.29	57	4167	0.134	ng		93
97) Hexachlorobutadiene	22.61	225	3263	0.203	ng		92
98) Cyclohexanone	18.38	55	2871	0.142	ng		96
99) tert-Butylbenzene	20.18	119	10936	0.201	ng		99
100) n-Butylbenzene	20.93	91	10479	0.179	ng		93

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data File : I:\MS13\DATA\2020 03\11\03112029.D Vial: 14
Acq On : 11 Mar 2020 18:43 Operator: WA
Sample : 0.2ng R13031120 ICAL Std Inst : MS13
Misc : S31-01272001/S34-03102004 (4/8)

Quant Time: Mar 12 06:16:09 2020
Quant Method : I:\MS13\METHODS\R13031120.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Mar 12 06:15:40 2020
Response via : Initial Calibration
DataAcq Meth:TO15.M



Quantitation Report (QT Reviewed)

Data File : I:\MS13\DATA\2020 03\11\03112030.D Vial: 15
Acq On : 11 Mar 2020 19:17 Operator: WA
Sample : 0.5ng R13031120 ICAL Std Inst : MS13
Misc : S31-01272001/S34-03062003 (4/4)

Quant Time: Mar 12 06:16:11 2020
Quant Method : I:\MS13\METHODS\R13031120.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Mar 12 06:15:40 2020
Response via : Initial Calibration
DataAcq Meth:TO15.M

VOA 3/12/20

Internal Standards	R.T.	QIon	Response	Conc	Units		Dev(Min)
1) Bromochloromethane (IS1)	11.22	130	143662	12.500	ng		-0.02
37) 1,4-Difluorobenzene (IS2)	13.35	114	645966	12.500	ng		0.00
56) Chlorobenzene-d5 (IS3)	17.67	82	283320	12.500	ng		0.00
System Monitoring Compounds							
33) 1,2-Dichloroethane-d4(...	12.08	65	198440	11.874	ng		-0.01
Spiked Amount 12.500	Range 70 - 130		Recovery = 94.96%				
57) Toluene-d8 (SS2)	15.80	98	719160	12.644	ng		0.00
Spiked Amount 12.500	Range 70 - 130		Recovery = 101.12%				
73) Bromofluorobenzene (SS3)	19.05	174	199937	13.488	ng		0.00
Spiked Amount 12.500	Range 70 - 130		Recovery = 107.92%				
Target Compounds							Qvalue
2) Propene	4.20	42	9645	0.443	ng		98
3) Dichlorodifluoromethan...	4.35	85	15456	0.507	ng		99
4) Chloromethane	4.63	50	12053	0.517	ng		95
5) 1,2-Dichloro-1,1,2,2-t...	4.90	135	8904	0.544	ng		99
6) Vinyl Chloride	5.05	62	12755	0.491	ng		95
7) 1,3-Butadiene	5.32	54	7820	0.433	ng		96
8) Bromomethane	5.75	94	7294	0.522	ng		100
9) Chloroethane	6.08	64	6427	0.511	ng		94
10) Ethanol	6.41	45	30834	2.216	ng		100
11) Acetonitrile	6.70	41	16013	0.453	ng		86
12) Acrolein	6.90	56	4374	0.414	ng		98
13) Acetone	7.10	58	33357	2.526	ng		96
14) Trichlorofluoromethane	7.34	101	12966	0.515	ng		98
15) 2-Propanol (Isopropanol)	7.62	45	38061	0.883	ng		93
16) Acrylonitrile	7.85	53	9906	0.432	ng		98
17) 1,1-Dichloroethene	8.29	96	7909	0.528	ng		97
18) 2-Methyl-2-Propanol (t...	8.49	59	33791	0.971	ng		96
19) Methylene Chloride	8.50	84	8030	0.496	ng		98
20) 3-Chloro-1-propene (Al...	8.67	41	11957	0.445	ng		92
21) Trichlorotrifluoroethane	8.94	151	7251	0.559	ng		100
22) Carbon Disulfide	8.79	76	31217	0.514	ng		98
23) trans-1,2-Dichloroethene	9.78	61	10570	0.477	ng		99
24) 1,1-Dichloroethane	10.03	63	14387	0.496	ng		98
25) Methyl tert-Butyl Ether	10.17	73	21812	0.590	ng		99
26) Vinyl Acetate	10.30	86	5514	1.562	ng	#	54
27) 2-Butanone (MEK)	10.58	72	4427	0.411	ng	#	43
28) cis-1,2-Dichloroethene	11.05	61	10294	0.464	ng		100
29) Diisopropyl Ether	11.37	87	8097	0.556	ng	#	90
30) Ethyl Acetate	11.37	61	5954	1.068	ng		95
31) n-Hexane	11.34	57	14437	0.503	ng		98
32) Chloroform	11.39	83	13319	0.510	ng		97
34) Tetrahydrofuran (THF)	11.86	72	5511	0.496	ng		99
35) Ethyl tert-Butyl Ether	11.96	87	8594	0.480	ng		95
36) 1,2-Dichloroethane	12.20	62	9447	0.498	ng		97
38) 1,1,1-Trichloroethane	12.48	97	11058	0.514	ng		98
39) Isopropyl Acetate	12.93	61	9564	0.933	ng		99
40) 1-Butanol	12.98	56	6463	0.423	ng	#	73
41) Benzene	12.96	78	35396	0.513	ng		98
42) Carbon Tetrachloride	13.12	117	9879	0.511	ng		100
43) Cyclohexane	13.25	84	25399	1.027	ng		97
44) tert-Amyl Methyl Ether	13.61	73	20860	0.482	ng		97
45) 1,2-Dichloropropane	13.81	63	8403	0.503	ng		100
46) Bromodichloromethane	14.00	83	9991	0.514	ng		99
47) Trichloroethene	14.06	130	8573	0.515	ng		100
48) 1,4-Dioxane	14.06	88	5965	0.500	ng		95
49) 2,2,4-Trimethylpentane...	14.12	57	35946	0.489	ng		100
50) Methyl Methacrylate	14.27	100	5629	0.964	ng	#	86

Quantitation Report (QT Reviewed)

Data File : I:\MS13\DATA\2020 03\11\03112030.D Vial: 15
Acq On : 11 Mar 2020 19:17 Operator: WA
Sample : 0.5ng R13031120 ICAL Std Inst : MS13
Misc : S31-01272001/S34-03062003 (4/4)

Quant Time: Mar 12 06:16:11 2020
Quant Method : I:\MS13\METHODS\R13031120.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Mar 12 06:15:40 2020
Response via : Initial Calibration
DataAcq Meth:TO15.M

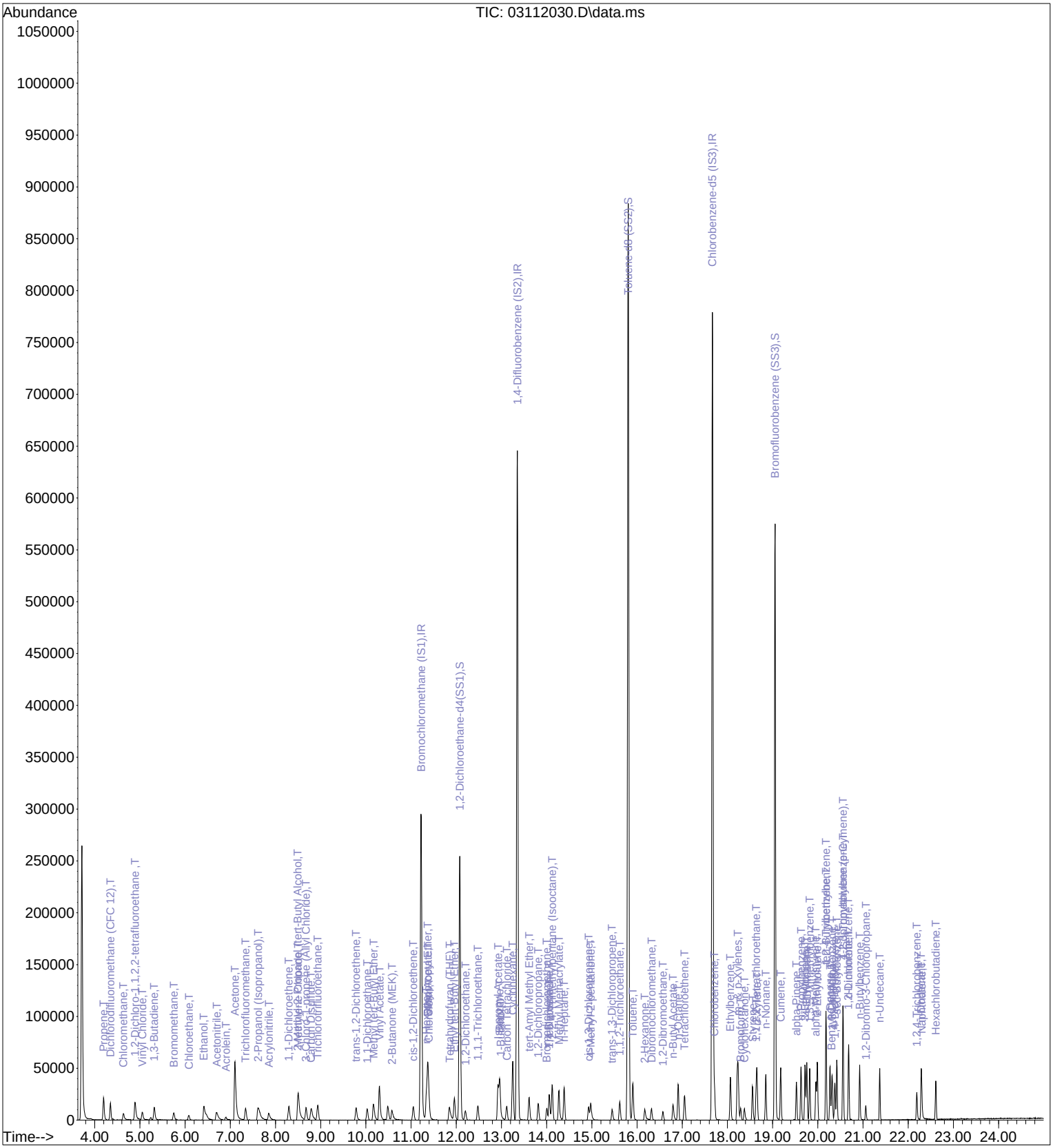
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.39	71	8742	0.515	ng	98
52) cis-1,3-Dichloropropene	14.93	75	11144	0.449	ng	100
53) 4-Methyl-2-pentanone	14.97	58	6124	0.416	ng	81
54) trans-1,3-Dichloropropene	15.45	75	8347	0.395	ng	98
55) 1,1,2-Trichloroethane	15.62	97	7772	0.518	ng	99
58) Toluene	15.91	91	33796	0.527	ng	100
59) 2-Hexanone	16.17	43	13830	0.427	ng	88
60) Dibromochloromethane	16.32	129	8591	0.548	ng	97
61) 1,2-Dibromoethane	16.57	107	7869	0.512	ng	100
62) n-Butyl Acetate	16.79	43	15647	0.437	ng	99
63) n-Octane	16.91	57	7107	0.497	ng	99
64) Tetrachloroethene	17.05	166	9772	0.545	ng	98
65) Chlorobenzene	17.71	112	22089	0.515	ng	97
66) Ethylbenzene	18.06	91	35785	0.520	ng	98
67) m- & p-Xylenes	18.23	91	57017	1.060	ng	97
68) Bromoform	18.29	173	6843	0.518	ng	98
69) Styrene	18.56	104	20120	0.491	ng	98
70) o-Xylene	18.66	91	28664	0.522	ng	97
71) n-Nonane	18.85	43	16238	0.496	ng	96
72) 1,1,2,2-Tetrachloroethane	18.63	83	13836	0.545	ng	96
74) Cumene	19.18	105	36922	0.532	ng	99
75) alpha-Pinene	19.53	93	15410	0.456	ng	93
76) n-Propylbenzene	19.63	91	44348	0.540	ng	98
77) 3-Ethyltoluene	19.72	105	37233	0.543	ng	99
78) 4-Ethyltoluene	19.75	105	34621	0.528	ng	100
79) 1,3,5-Trimethylbenzene	19.82	105	30812	0.533	ng	98
80) alpha-Methylstyrene	19.95	118	13302	0.462	ng	97
81) 2-Ethyltoluene	19.99	105	37147	0.550	ng	97
82) 1,2,4-Trimethylbenzene	20.18	105	29643	0.537	ng	99
83) n-Decane	20.27	57	17569	0.542	ng	98
84) Benzyl Chloride	20.30	91	12274	0.279	ng	96
85) 1,3-Dichlorobenzene	20.32	146	18337	0.540	ng	100
86) 1,4-Dichlorobenzene	20.38	146	18537	0.535	ng	100
87) sec-Butylbenzene	20.42	105	41095	0.537	ng	99
88) 4-Isopropyltoluene (p-...	20.56	119	38543	0.570	ng	98
89) 1,2,3-Trimethylbenzene	20.56	105	30972	0.562	ng	99
90) 1,2-Dichlorobenzene	20.68	146	17063	0.530	ng	99
91) d-Limonene	20.68	68	9724	0.458	ng	97
92) 1,2-Dibromo-3-Chloropr...	21.06	157	4744	0.406	ng	89
93) n-Undecane	21.37	57	15671	0.454	ng	95
94) 1,2,4-Trichlorobenzene	22.19	180	10515	0.431	ng	98
95) Naphthalene	22.30	128	29440	0.432	ng	96
96) n-Dodecane	22.29	57	10455	0.334	ng	97
97) Hexachlorobutadiene	22.61	225	8631	0.536	ng	97
98) Cyclohexanone	18.38	55	6711	0.330	ng	100
99) tert-Butylbenzene	20.18	119	30309	0.554	ng	99
100) n-Butylbenzene	20.93	91	30575	0.521	ng	96

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data File : I:\MS13\DATA\2020 03\11\03112030.D Vial: 15
Acq On : 11 Mar 2020 19:17 Operator: WA
Sample : 0.5ng R13031120 ICAL Std Inst : MS13
Misc : S31-01272001/S34-03062003 (4/4)

Quant Time: Mar 12 06:16:11 2020
Quant Method : I:\MS13\METHODS\R13031120.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Mar 12 06:15:40 2020
Response via : Initial Calibration
DataAcq Meth:TO15.M



Quantitation Report (QT Reviewed)

Data File : I:\MS13\DATA\2020 03\11\03112031.D Vial: 15
Acq On : 11 Mar 2020 19:51 Operator: WA
Sample : 1.0ng R13031120 ICAL Std Inst : MS13
Misc : S31-01272001/S34-03062003 (4/4)

Quant Time: Mar 12 06:16:13 2020
Quant Method : I:\MS13\METHODS\R13031120.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Mar 12 06:15:40 2020
Response via : Initial Calibration
DataAcq Meth:TO15.M

WA 3/12/20

Internal Standards	R.T.	QIon	Response	Conc	Units		Dev(Min)
1) Bromochloromethane (IS1)	11.22	130	144849	12.500	ng		-0.02
37) 1,4-Difluorobenzene (IS2)	13.35	114	648142	12.500	ng		0.00
56) Chlorobenzene-d5 (IS3)	17.67	82	285318	12.500	ng		0.00
System Monitoring Compounds							
33) 1,2-Dichloroethane-d4(...	12.08	65	200989	11.928	ng		-0.01
Spiked Amount 12.500	Range 70 - 130		Recovery = 95.44%				
57) Toluene-d8 (SS2)	15.80	98	718843	12.550	ng		0.00
Spiked Amount 12.500	Range 70 - 130		Recovery = 100.40%				
73) Bromofluorobenzene (SS3)	19.05	174	205459	13.764	ng		0.00
Spiked Amount 12.500	Range 70 - 130		Recovery = 110.08%				
Target Compounds							Qvalue
2) Propene	4.18	42	17880	0.815	ng		99
3) Dichlorodifluoromethan...	4.34	85	28303	0.921	ng		99
4) Chloromethane	4.62	50	21912	0.932	ng		94
5) 1,2-Dichloro-1,1,2,2-t...	4.88	135	16334	0.989	ng		99
6) Vinyl Chloride	5.04	62	23621	0.901	ng		95
7) 1,3-Butadiene	5.30	54	14652	0.805	ng		99
8) Bromomethane	5.74	94	13855	0.984	ng		99
9) Chloroethane	6.07	64	11792	0.929	ng		100
10) Ethanol	6.41	45	57341	4.087	ng		100
11) Acetonitrile	6.69	41	30037	0.843	ng		89
12) Acrolein	6.89	56	8543	0.802	ng		97
13) Acetone	7.09	58	62258	4.676	ng		99
14) Trichlorofluoromethane	7.33	101	23638	0.931	ng		99
15) 2-Propanol (Isopropanol)	7.59	45	71395	1.642	ng		94
16) Acrylonitrile	7.85	53	19762	0.856	ng		98
17) 1,1-Dichloroethene	8.29	96	14438	0.956	ng		99
18) 2-Methyl-2-Propanol (t...	8.48	59	65357	1.862	ng		97
19) Methylene Chloride	8.50	84	15038	0.921	ng		99
20) 3-Chloro-1-propene (Al...	8.67	41	22851	0.843	ng		95
21) Trichlorotrifluoroethane	8.93	151	13160	1.006	ng		98
22) Carbon Disulfide	8.78	76	57519	0.939	ng		98
23) trans-1,2-Dichloroethene	9.78	61	20177	0.903	ng		99
24) 1,1-Dichloroethane	10.03	63	27013	0.924	ng		98
25) Methyl tert-Butyl Ether	10.16	73	42710	1.146	ng		99
26) Vinyl Acetate	10.30	86	11411	3.205	ng	#	67
27) 2-Butanone (MEK)	10.56	72	9875	0.908	ng		96
28) cis-1,2-Dichloroethene	11.05	61	19393	0.867	ng		99
29) Diisopropyl Ether	11.36	87	15421	1.051	ng	#	89
30) Ethyl Acetate	11.37	61	12153	2.163	ng		93
31) n-Hexane	11.34	57	27365	0.945	ng		100
32) Chloroform	11.39	83	23996	0.911	ng		99
34) Tetrahydrofuran (THF)	11.83	72	10042	0.896	ng	#	90
35) Ethyl tert-Butyl Ether	11.95	87	16672	0.923	ng		98
36) 1,2-Dichloroethane	12.20	62	17265	0.903	ng		100
38) 1,1,1-Trichloroethane	12.48	97	20417	0.946	ng		98
39) Isopropyl Acetate	12.92	61	18390	1.787	ng		94
40) 1-Butanol	12.96	56	14141	0.923	ng	#	77
41) Benzene	12.95	78	64293	0.930	ng		98
42) Carbon Tetrachloride	13.11	117	17992	0.928	ng		98
43) Cyclohexane	13.25	84	47197	1.902	ng		98
44) tert-Amyl Methyl Ether	13.61	73	38427	0.885	ng		96
45) 1,2-Dichloropropane	13.81	63	15068	0.899	ng		98
46) Bromodichloromethane	14.00	83	18400	0.944	ng		98
47) Trichloroethene	14.06	130	16042	0.961	ng		100
48) 1,4-Dioxane	14.05	88	11550	0.965	ng		96
49) 2,2,4-Trimethylpentane...	14.12	57	67008	0.909	ng		99
50) Methyl Methacrylate	14.27	100	11609	1.982	ng		96

Data File : I:\MS13\DATA\2020 03\11\03112031.D Vial: 15
Acq On : 11 Mar 2020 19:51 Operator: WA
Sample : 1.0ng R13031120 ICAL Std Inst : MS13
Misc : S31-01272001/S34-03062003 (4/4)

Quant Time: Mar 12 06:16:13 2020
Quant Method : I:\MS13\METHODS\R13031120.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Mar 12 06:15:40 2020
Response via : Initial Calibration
DataAcq Meth:TO15.M

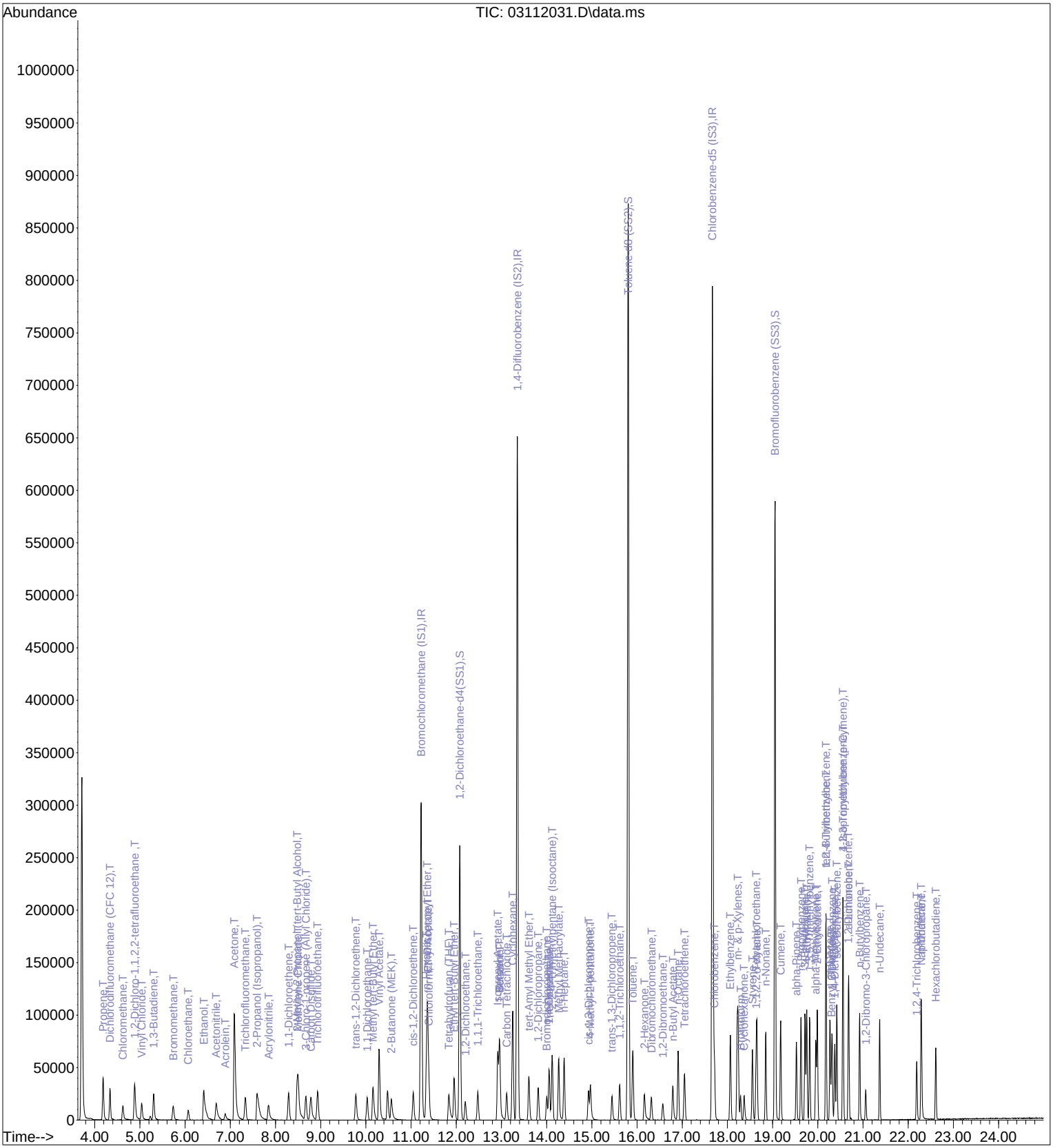
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.39	71	16008	0.941	ng	99
52) cis-1,3-Dichloropropene	14.93	75	22195	0.891	ng	97
53) 4-Methyl-2-pentanone	14.97	58	12662	0.856	ng	93
54) trans-1,3-Dichloropropene	15.44	75	17508	0.825	ng	97
55) 1,1,2-Trichloroethane	15.62	97	14751	0.980	ng	98
58) Toluene	15.91	91	62216	0.964	ng	99
59) 2-Hexanone	16.16	43	27713	0.849	ng	95
60) Dibromochloromethane	16.32	129	15799	1.000	ng	100
61) 1,2-Dibromoethane	16.57	107	15236	0.985	ng	99
62) n-Butyl Acetate	16.79	43	31641	0.877	ng	99
63) n-Octane	16.91	57	13521	0.939	ng	97
64) Tetrachloroethene	17.05	166	17868	0.990	ng	100
65) Chlorobenzene	17.71	112	41514	0.962	ng	99
66) Ethylbenzene	18.06	91	67242	0.971	ng	98
67) m- & p-Xylenes	18.23	91	107856	1.992	ng	97
68) Bromoform	18.29	173	13281	0.998	ng	99
69) Styrene	18.55	104	38789	0.940	ng	99
70) o-Xylene	18.65	91	52824	0.955	ng	99
71) n-Nonane	18.85	43	30958	0.938	ng	98
72) 1,1,2,2-Tetrachloroethane	18.63	83	25055	0.980	ng	99
74) Cumene	19.18	105	69492	0.995	ng	99
75) alpha-Pinene	19.53	93	29895	0.878	ng	93
76) n-Propylbenzene	19.63	91	83449	1.008	ng	98
77) 3-Ethyltoluene	19.71	105	70555	1.022	ng	99
78) 4-Ethyltoluene	19.75	105	63687	0.964	ng	99
79) 1,3,5-Trimethylbenzene	19.82	105	56622	0.972	ng	98
80) alpha-Methylstyrene	19.95	118	25861	0.891	ng	97
81) 2-Ethyltoluene	19.99	105	68289	1.005	ng	98
82) 1,2,4-Trimethylbenzene	20.18	105	56112	1.010	ng	99
83) n-Decane	20.27	57	32570	0.997	ng	98
84) Benzyl Chloride	20.30	91	26008	0.586	ng	97
85) 1,3-Dichlorobenzene	20.32	146	33347	0.976	ng	99
86) 1,4-Dichlorobenzene	20.37	146	34330	0.984	ng	100
87) sec-Butylbenzene	20.42	105	76467	0.991	ng	99
88) 4-Isopropyltoluene (p-...	20.56	119	72709	1.068	ng	99
89) 1,2,3-Trimethylbenzene	20.56	105	57582	1.037	ng	100
90) 1,2-Dichlorobenzene	20.68	146	32130	0.991	ng	100
91) d-Limonene	20.68	68	19241	0.900	ng	97
92) 1,2-Dibromo-3-Chloropr...	21.06	157	9868	0.839	ng	94
93) n-Undecane	21.37	57	30545	0.879	ng	99
94) 1,2,4-Trichlorobenzene	22.19	180	21510	0.875	ng	99
95) Naphthalene	22.29	128	57839	0.842	ng	98
96) n-Dodecane	22.29	57	22488	0.713	ng	96
97) Hexachlorobutadiene	22.61	225	15758	0.972	ng	98
98) Cyclohexanone	18.37	55	13493	0.659	ng	97
99) tert-Butylbenzene	20.18	119	56152	1.020	ng	99
100) n-Butylbenzene	20.93	91	58229	0.986	ng	98

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data File : I:\MS13\DATA\2020 03\11\03112031.D Vial: 15
Acq On : 11 Mar 2020 19:51 Operator: WA
Sample : 1.0ng R13031120 ICAL Std Inst : MS13
Misc : S31-01272001/S34-03062003 (4/4)

Quant Time: Mar 12 06:16:13 2020
Quant Method : I:\MS13\METHODS\R13031120.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Mar 12 06:15:40 2020
Response via : Initial Calibration
DataAcq Meth:TO15.M



Quantitation Report (QT Reviewed)

Data File : I:\MS13\DATA\2020 03\11\03112032.D Vial: 15
Acq On : 11 Mar 2020 20:25 Operator: WA
Sample : 5.0ng R13031120 ICAL Std Inst : MS13
Misc : S31-01272001/S34-03062003 (4/4)

Quant Time: Mar 12 06:16:15 2020
Quant Method : I:\MS13\METHODS\R13031120.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Mar 12 06:15:40 2020
Response via : Initial Calibration
DataAcq Meth:TO15.M

3/12/20

Internal Standards	R.T.	QIon	Response	Conc	Units		Dev(Min)
1) Bromochloromethane (IS1)	11.23	130	129614	12.500	ng		-0.01
37) 1,4-Difluorobenzene (IS2)	13.35	114	581349	12.500	ng		0.00
56) Chlorobenzene-d5 (IS3)	17.67	82	254496	12.500	ng		0.00
System Monitoring Compounds							
33) 1,2-Dichloroethane-d4(...	12.08	65	180622	11.980	ng		0.00
Spiked Amount 12.500	Range 70 - 130		Recovery = 95.84%				
57) Toluene-d8 (SS2)	15.80	98	645584	12.636	ng		0.00
Spiked Amount 12.500	Range 70 - 130		Recovery = 101.12%				
73) Bromofluorobenzene (SS3)	19.05	174	183836	13.807	ng		0.00
Spiked Amount 12.500	Range 70 - 130		Recovery = 110.48%				
Target Compounds							Qvalue
2) Propene	4.17	42	83970	4.278	ng		99
3) Dichlorodifluoromethan...	4.33	85	128363	4.668	ng		99
4) Chloromethane	4.60	50	78052	3.712	ng		100
5) 1,2-Dichloro-1,1,2,2-t...	4.88	135	73520	4.977	ng		100
6) Vinyl Chloride	5.03	62	107874	4.599	ng		99
7) 1,3-Butadiene	5.29	54	71986	4.421	ng		99
8) Bromomethane	5.73	94	63092	5.006	ng		100
9) Chloroethane	6.06	64	55195	4.862	ng		100
10) Ethanol	6.42	45	256161	20.403	ng		100
11) Acetonitrile	6.68	41	139771	4.381	ng		98
12) Acrolein	6.88	56	42727	4.482	ng		100
13) Acetone	7.08	58	280879	23.574	ng		98
14) Trichlorofluoromethane	7.33	101	107258	4.721	ng		99
15) 2-Propanol (Isopropanol)	7.58	45	343281	8.825	ng		97
16) Acrylonitrile	7.84	53	98291	4.756	ng		99
17) 1,1-Dichloroethene	8.29	96	67079	4.962	ng		99
18) 2-Methyl-2-Propanol (t...	8.45	59	283004	9.011	ng		98
19) Methylene Chloride	8.51	84	69164	4.733	ng		100
20) 3-Chloro-1-propene (Al...	8.67	41	108980	4.494	ng		98
21) Trichlorotrifluoroethane	8.93	151	61516	5.253	ng		99
22) Carbon Disulfide	8.78	76	254242	4.637	ng		100
23) trans-1,2-Dichloroethene	9.78	61	96679	4.837	ng		100
24) 1,1-Dichloroethane	10.03	63	122335	4.677	ng		100
25) Methyl tert-Butyl Ether	10.14	73	155861	4.674	ng		99
26) Vinyl Acetate	10.29	86	58295	18.299	ng	#	80
27) 2-Butanone (MEK)	10.55	72	48305	4.966	ng		95
28) cis-1,2-Dichloroethene	11.05	61	91360	4.562	ng		99
29) Diisopropyl Ether	11.35	87	69731	5.309	ng	#	91
30) Ethyl Acetate	11.36	61	57380	11.412	ng		96
31) n-Hexane	11.34	57	124024	4.785	ng		100
32) Chloroform	11.39	83	110888	4.704	ng		100
34) Tetrahydrofuran (THF)	11.82	72	47360	4.725	ng		99
35) Ethyl tert-Butyl Ether	11.95	87	79359	4.909	ng		97
36) 1,2-Dichloroethane	12.20	62	80905	4.727	ng		100
38) 1,1,1-Trichloroethane	12.48	97	91775	4.742	ng		99
39) Isopropyl Acetate	12.91	61	89963	9.748	ng	#	92
40) 1-Butanol	12.93	56	77423	5.634	ng	#	66
41) Benzene	12.96	78	285064	4.595	ng		99
42) Carbon Tetrachloride	13.12	117	82880	4.767	ng		100
43) Cyclohexane	13.25	84	212938	9.567	ng		98
44) tert-Amyl Methyl Ether	13.60	73	188379	4.838	ng		98
45) 1,2-Dichloropropane	13.81	63	70452	4.685	ng		99
46) Bromodichloromethane	14.00	83	85730	4.902	ng		100
47) Trichloroethene	14.06	130	75323	5.030	ng		99
48) 1,4-Dioxane	14.03	88	55285	5.152	ng		100
49) 2,2,4-Trimethylpentane...	14.13	57	302627	4.575	ng		99
50) Methyl Methacrylate	14.26	100	57521	10.948	ng		96

Quantitation Report (QT Reviewed)

Data File : I:\MS13\DATA\2020 03\11\03112032.D Vial: 15
Acq On : 11 Mar 2020 20:25 Operator: WA
Sample : 5.0ng R13031120 ICAL Std Inst : MS13
Misc : S31-01272001/S34-03062003 (4/4)

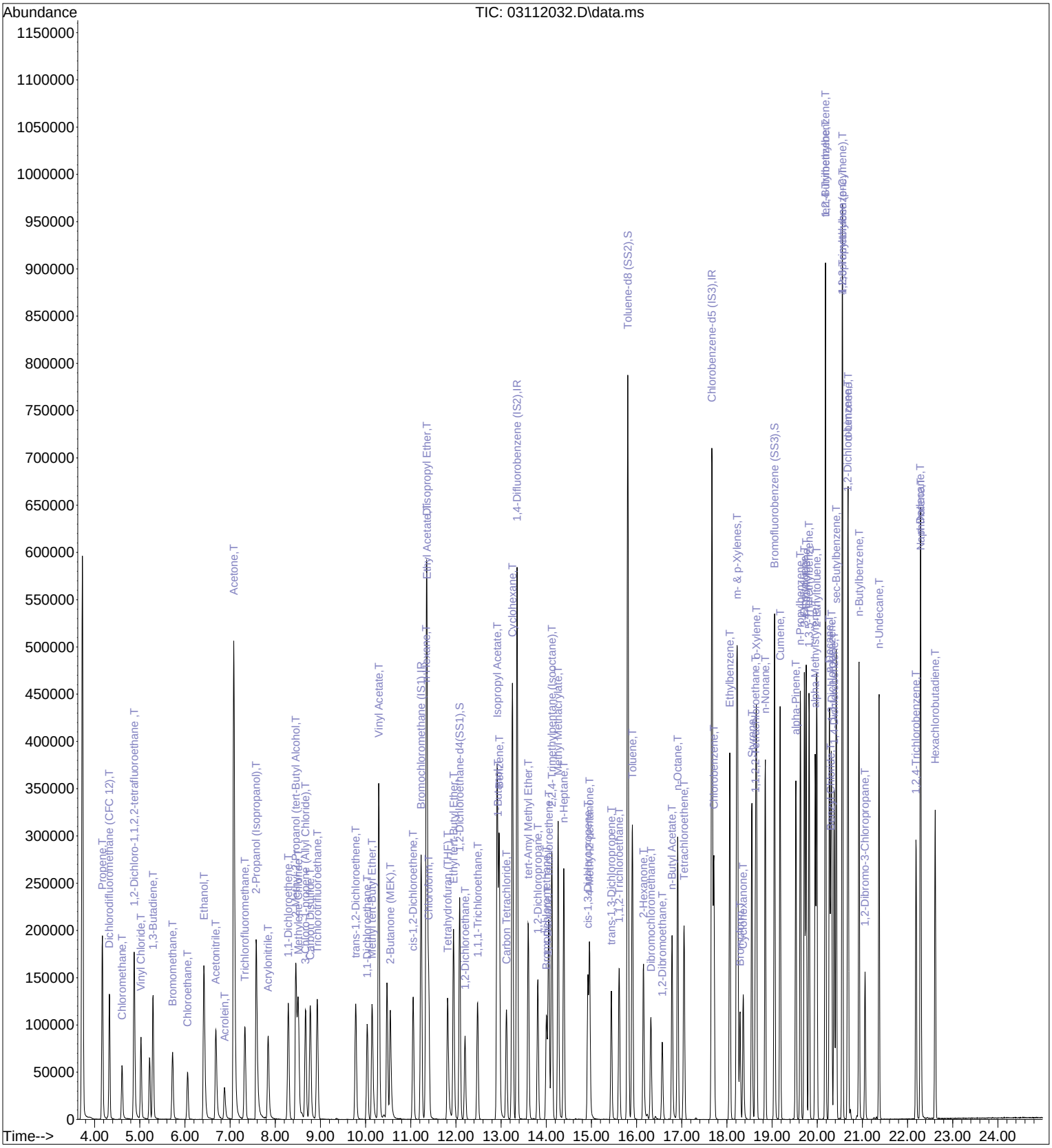
Quant Time: Mar 12 06:16:15 2020
Quant Method : I:\MS13\METHODS\R13031120.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Mar 12 06:15:40 2020
Response via : Initial Calibration
DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.39	71	73342	4.804	ng	99
52) cis-1,3-Dichloropropene	14.92	75	107840	4.826	ng	100
53) 4-Methyl-2-pentanone	14.96	58	62333	4.701	ng	95
54) trans-1,3-Dichloropropene	15.44	75	92768	4.874	ng	100
55) 1,1,2-Trichloroethane	15.61	97	65533	4.854	ng	99
58) Toluene	15.91	91	284030	4.934	ng	99
59) 2-Hexanone	16.15	43	142854	4.905	ng	98
60) Dibromochloromethane	16.32	129	74647	5.299	ng	99
61) 1,2-Dibromoethane	16.57	107	72183	5.233	ng	99
62) n-Butyl Acetate	16.78	43	170569	5.302	ng	100
63) n-Octane	16.91	57	62818	4.892	ng	98
64) Tetrachloroethene	17.05	166	80242	4.984	ng	98
65) Chlorobenzene	17.71	112	188872	4.905	ng	100
66) Ethylbenzene	18.06	91	314822	5.096	ng	98
67) m- & p-Xylenes	18.22	91	482008	9.978	ng	100
68) Bromoform	18.29	173	64061	5.396	ng	99
69) Styrene	18.55	104	189967	5.159	ng	100
70) o-Xylene	18.65	91	244607	4.958	ng	99
71) n-Nonane	18.85	43	142633	4.847	ng	98
72) 1,1,2,2-Tetrachloroethane	18.63	83	114881	5.037	ng	100
74) Cumene	19.18	105	319384	5.128	ng	99
75) alpha-Pinene	19.53	93	150516	4.958	ng	96
76) n-Propylbenzene	19.62	91	380912	5.161	ng	99
77) 3-Ethyltoluene	19.71	105	299481	4.864	ng	95
78) 4-Ethyltoluene	19.75	105	317690	5.389	ng	94
79) 1,3,5-Trimethylbenzene	19.82	105	256941	4.946	ng	99
80) alpha-Methylstyrene	19.95	118	127246	4.917	ng	99
81) 2-Ethyltoluene	19.99	105	308321	5.086	ng	99
82) 1,2,4-Trimethylbenzene	20.18	105	258679	5.221	ng	100
83) n-Decane	20.27	57	149020	5.116	ng	98
84) Benzyl Chloride	20.29	91	151345	3.826	ng	99
85) 1,3-Dichlorobenzene	20.32	146	154745	5.075	ng	100
86) 1,4-Dichlorobenzene	20.37	146	155632	5.000	ng	99
87) sec-Butylbenzene	20.42	105	350712	5.098	ng	99
88) 4-Isopropyltoluene (p-...	20.56	119	329782	5.431	ng	99
89) 1,2,3-Trimethylbenzene	20.56	105	265906	5.371	ng	100
90) 1,2-Dichlorobenzene	20.68	146	148401	5.130	ng	100
91) d-Limonene	20.68	68	94349	4.948	ng	98
92) 1,2-Dibromo-3-Chloropr...	21.06	157	49137	4.686	ng	97
93) n-Undecane	21.37	57	148334	4.783	ng	99
94) 1,2,4-Trichlorobenzene	22.18	180	106482	4.858	ng	99
95) Naphthalene	22.29	128	289920	4.734	ng	100
96) n-Dodecane	22.28	57	118636	4.217	ng	98
97) Hexachlorobutadiene	22.61	225	71727	4.960	ng	100
98) Cyclohexanone	18.36	55	67324	3.687	ng	99
99) tert-Butylbenzene	20.18	119	257528	5.245	ng	99
100) n-Butylbenzene	20.93	91	273832	5.197	ng	98

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Data File : I:\MS13\DATA\2020 03\11\03112032.D Vial: 15
Acq On : 11 Mar 2020 20:25 Operator: WA
Sample : 5.0ng R13031120 ICAL Std Inst : MS13
Misc : S31-01272001/S34-03062003 (4/4)

Quant Time: Mar 12 06:16:15 2020
Quant Method : I:\MS13\METHODS\R13031120.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Mar 12 06:15:40 2020
Response via : Initial Calibration
DataAcq Meth:TO15.M



Quantitation Report (QT Reviewed)

Data File : I:\MS13\DATA\2020 03\11\03112033.D Vial: 16
Acq On : 11 Mar 2020 20:59 Operator: WA
Sample : 25ng R13031120 ICAL Std Inst : MS13
Misc : S31-01272001/S34-03112002 (4/9)

Quant Time: Mar 12 06:16:16 2020
Quant Method : I:\MS13\METHODS\R13031120.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Mar 12 06:15:40 2020 3/12/20
Response via : Initial Calibration
DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.24	130	133494	12.500	ng	0.00
37) 1,4-Difluorobenzene (IS2)	13.36	114	595001	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	17.67	82	260222	12.500	ng	0.00
System Monitoring Compounds						
33) 1,2-Dichloroethane-d4(...	12.09	65	184075	11.854	ng	0.00
Spiked Amount 12.500	Range 70 - 130		Recovery = 94.80%			
57) Toluene-d8 (SS2)	15.80	98	659010	12.615	ng	0.00
Spiked Amount 12.500	Range 70 - 130		Recovery = 100.88%			
73) Bromofluorobenzene (SS3)	19.05	174	188855	13.872	ng	0.00
Spiked Amount 12.500	Range 70 - 130		Recovery = 110.96%			
Target Compounds						Qvalue
2) Propene	4.16	42	418577	20.704	ng	100
3) Dichlorodifluoromethan...	4.32	85	644930	22.770	ng	100
4) Chloromethane	4.60	50	423403	19.550	ng	100
5) 1,2-Dichloro-1,1,2,2-t...	4.87	135	376506	24.748	ng	100
6) Vinyl Chloride	5.03	62	559150	23.144	ng	100
7) 1,3-Butadiene	5.29	54	397136	23.680	ng	100
8) Bromomethane	5.73	94	328403	25.298	ng	100
9) Chloroethane	6.07	64	282033	24.119	ng	100
10) Ethanol	6.45	45	1379313	106.669	ng	100
11) Acetonitrile	6.70	41	711273	21.648	ng	100
12) Acrolein	6.88	56	239950	24.437	ng	100
13) Acetone	7.09	58	1360611	110.876	ng	100
14) Trichlorofluoromethane	7.33	101	555664	23.749	ng	100
15) 2-Propanol (Isopropanol)	7.59	45	1885328	47.061	ng	100
16) Acrylonitrile	7.85	53	516176	24.251	ng	100
17) 1,1-Dichloroethene	8.29	96	351123	25.218	ng	100
18) 2-Methyl-2-Propanol (t...	8.46	59	1645210	50.861	ng	100
19) Methylene Chloride	8.53	84	354737	23.570	ng	100
20) 3-Chloro-1-propene (Al...	8.68	41	571709	22.891	ng	100
21) Trichlorotrifluoroethane	8.93	151	314951	26.112	ng	100
22) Carbon Disulfide	8.79	76	1288196	22.813	ng	100
23) trans-1,2-Dichloroethene	9.79	61	509084	24.731	ng	100
24) 1,1-Dichloroethane	10.05	63	632332	23.473	ng	100
25) Methyl tert-Butyl Ether	10.14	73	521998	15.198	ng	100
26) Vinyl Acetate	10.30	86	451108	137.486	ng	100
27) 2-Butanone (MEK)	10.54	72	256246	25.577	ng	100
28) cis-1,2-Dichloroethene	11.06	61	475290	23.044	ng	100
29) Diisopropyl Ether	11.35	87	313398	23.166	ng	100
30) Ethyl Acetate	11.36	61	272662	52.652	ng	100
31) n-Hexane	11.34	57	611225	22.897	ng	100
32) Chloroform	11.41	83	569774	23.468	ng	100
34) Tetrahydrofuran (THF)	11.81	72	247066	23.933	ng	100
35) Ethyl tert-Butyl Ether	11.95	87	423649	25.447	ng	100
36) 1,2-Dichloroethane	12.21	62	419712	23.812	ng	100
38) 1,1,1-Trichloroethane	12.48	97	474993	23.981	ng	100
39) Isopropyl Acetate	12.91	61	467389	49.484	ng	100
40) 1-Butanol	12.93	56	724596	51.520	ng	100
41) Benzene	12.96	78	1433454	22.577	ng	100
42) Carbon Tetrachloride	13.12	117	441300	24.802	ng	100
43) Cyclohexane	13.25	84	1086689	47.704	ng	100
44) tert-Amyl Methyl Ether	13.60	73	1006524	25.256	ng	100
45) 1,2-Dichloropropane	13.81	63	366291	23.798	ng	100
46) Bromodichloromethane	14.01	83	453377	25.327	ng	100
47) Trichloroethene	14.06	130	394428	25.734	ng	100
48) 1,4-Dioxane	14.03	88	308137	28.054	ng	100
49) 2,2,4-Trimethylpentane...	14.13	57	1533675	22.653	ng	100
50) Methyl Methacrylate	14.26	100	314544	58.495	ng	100

Quantitation Report (QT Reviewed)

Data File : I:\MS13\DATA\2020 03\11\03112033.D Vial: 16
Acq On : 11 Mar 2020 20:59 Operator: WA
Sample : 25ng R13031120 ICAL Std Inst : MS13
Misc : S31-01272001/S34-03112002 (4/9)

Quant Time: Mar 12 06:16:16 2020
Quant Method : I:\MS13\METHODS\R13031120.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Mar 12 06:15:40 2020
Response via : Initial Calibration
DataAcq Meth:TO15.M

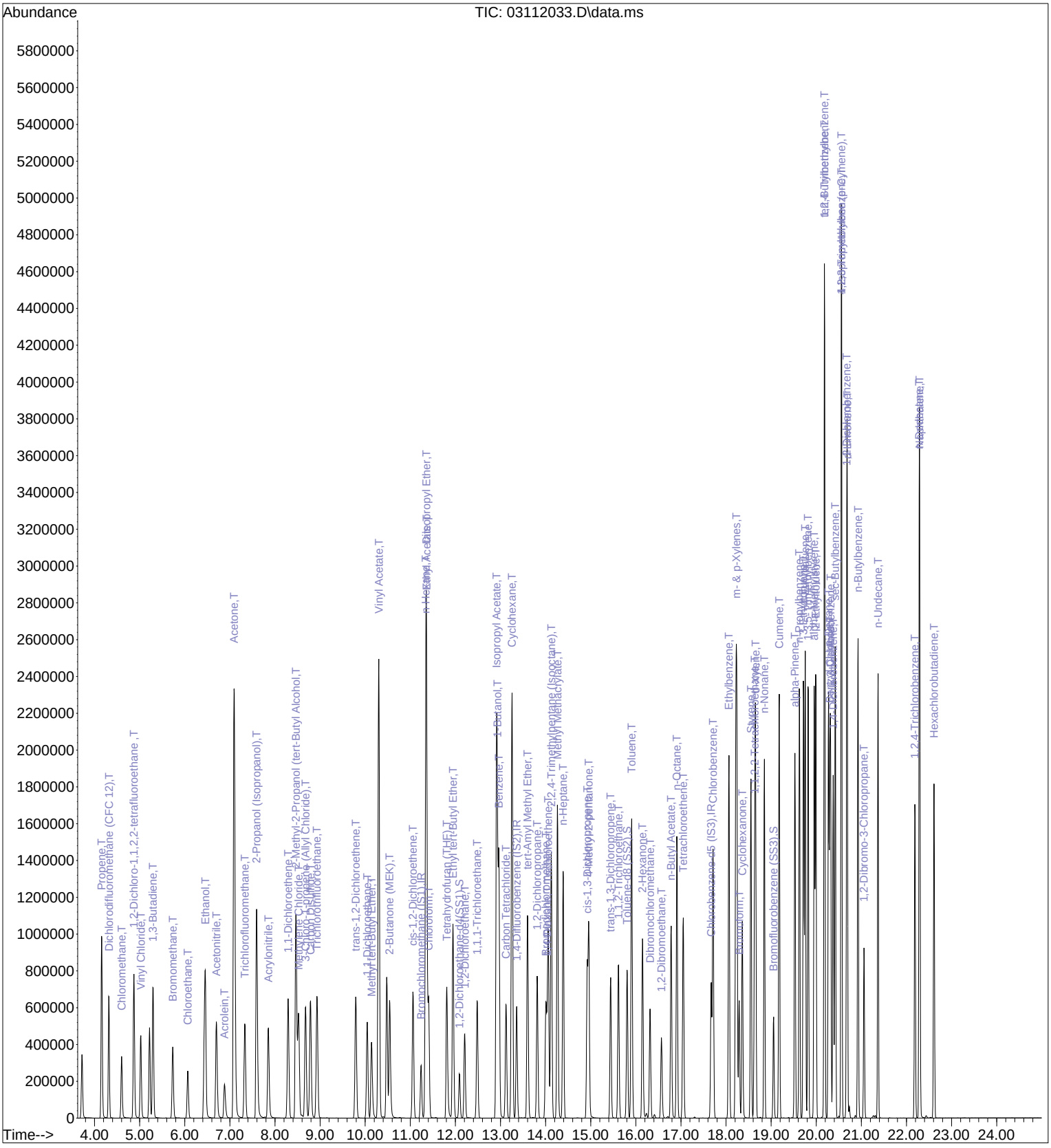
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.39	71	379779	24.307	ng	100
52) cis-1,3-Dichloropropene	14.92	75	586902	25.660	ng	100
53) 4-Methyl-2-pentanone	14.96	58	344502	25.383	ng	100
54) trans-1,3-Dichloropropene	15.44	75	520161	26.700	ng	100
55) 1,1,2-Trichloroethane	15.62	97	343726	24.877	ng	100
58) Toluene	15.91	91	1449701	24.632	ng	100
59) 2-Hexanone	16.15	43	787554	26.449	ng	100
60) Dibromochloromethane	16.32	129	403529	28.013	ng	100
61) 1,2-Dibromoethane	16.57	107	385308	27.321	ng	100
62) n-Butyl Acetate	16.78	43	894108	27.181	ng	100
63) n-Octane	16.91	57	318540	24.262	ng	100
64) Tetrachloroethene	17.05	166	424237	25.770	ng	100
65) Chlorobenzene	17.71	112	974145	24.744	ng	100
66) Ethylbenzene	18.06	91	1610053	25.490	ng	100
67) m- & p-Xylenes	18.23	91	2468450	49.976	ng	100
68) Bromoform	18.29	173	359277	29.598	ng	100
69) Styrene	18.55	104	1031232	27.389	ng	100
70) o-Xylene	18.66	91	1259711	24.973	ng	100
71) n-Nonane	18.85	43	715045	23.764	ng	100
72) 1,1,2,2-Tetrachloroethane	18.63	83	602621	25.843	ng	100
74) Cumene	19.18	105	1646217	25.848	ng	100
75) alpha-Pinene	19.53	93	837017	26.965	ng	100
76) n-Propylbenzene	19.62	91	1938611	25.688	ng	100
77) 3-Ethyltoluene	19.71	105	1671996	26.559	ng	100
78) 4-Ethyltoluene	19.75	105	1530376	25.389	ng	100
79) 1,3,5-Trimethylbenzene	19.82	105	1336641	25.164	ng	100
80) alpha-Methylstyrene	19.95	118	759164	28.692	ng	100
81) 2-Ethyltoluene	19.99	105	1597378	25.769	ng	100
82) 1,2,4-Trimethylbenzene	20.18	105	1359669	26.837	ng	100
83) n-Decane	20.27	57	753126	25.286	ng	100
84) Benzyl Chloride	20.30	91	1129340	27.918	ng	100
85) 1,3-Dichlorobenzene	20.32	146	827715	26.549	ng	100
86) 1,4-Dichlorobenzene	20.37	146	829069	26.048	ng	100
87) sec-Butylbenzene	20.42	105	1813299	25.779	ng	100
88) 4-Isopropyltoluene (p-...	20.56	119	1719484	27.694	ng	100
89) 1,2,3-Trimethylbenzene	20.56	105	1390375	27.467	ng	100
90) 1,2-Dichlorobenzene	20.68	146	792904	26.805	ng	100
91) d-Limonene	20.69	68	543744	27.888	ng	100
92) 1,2-Dibromo-3-Chloropr...	21.06	157	296269	27.632	ng	100
93) n-Undecane	21.37	57	784716	24.748	ng	100
94) 1,2,4-Trichlorobenzene	22.18	180	612425	27.327	ng	100
95) Naphthalene	22.29	128	1765695	28.197	ng	100
96) n-Dodecane	22.28	57	706729	24.569	ng	100
97) Hexachlorobutadiene	22.61	225	399279	27.002	ng	100
98) Cyclohexanone	18.36	55	500096	26.786	ng	100
99) tert-Butylbenzene	20.18	119	1334816	26.585	ng	100
100) n-Butylbenzene	20.93	91	1439781	26.723	ng	100

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data File : I:\MS13\DATA\2020 03\11\03112033.D Vial: 16
Acq On : 11 Mar 2020 20:59 Operator: WA
Sample : 25ng R13031120 ICAL Std Inst : MS13
Misc : S31-01272001/S34-03112002 (4/9)

Quant Time: Mar 12 06:16:16 2020
Quant Method : I:\MS13\METHODS\R13031120.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Mar 12 06:15:40 2020
Response via : Initial Calibration
DataAcq Meth:TO15.M



Quantitation Report (QT Reviewed)

Data File : I:\MS13\DATA\2020 03\11\03112034.D Vial: 16
Acq On : 11 Mar 2020 21:33 Operator: WA
Sample : 50ng R13031120 ICAL Std Inst : MS13
Misc : S31-01272001/S34-03112002 (4/9)

Quant Time: Mar 12 06:16:19 2020
Quant Method : I:\MS13\METHODS\R13031120.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Mar 12 06:15:40 2020 3/12/20
Response via : Initial Calibration
DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units		Dev(Min)
1) Bromochloromethane (IS1)	11.25	130	138210	12.500	ng		0.00
37) 1,4-Difluorobenzene (IS2)	13.36	114	616694	12.500	ng		0.00
56) Chlorobenzene-d5 (IS3)	17.67	82	270013	12.500	ng		0.00
System Monitoring Compounds							
33) 1,2-Dichloroethane-d4(...	12.09	65	188249	11.709	ng		0.00
Spiked Amount 12.500	Range 70 - 130		Recovery = 93.68%				
57) Toluene-d8 (SS2)	15.81	98	683931	12.617	ng		0.00
Spiked Amount 12.500	Range 70 - 130		Recovery = 100.96%				
73) Bromofluorobenzene (SS3)	19.05	174	196721	13.925	ng		0.00
Spiked Amount 12.500	Range 70 - 130		Recovery = 111.44%				
Target Compounds							Qvalue
2) Propene	4.16	42	822548	39.297	ng		99
3) Dichlorodifluoromethan...	4.32	85	1257356	42.877	ng		100
4) Chloromethane	4.60	50	685652	30.578	ng		99
5) 1,2-Dichloro-1,1,2,2-t...	4.88	135	749925	47.610	ng		100
6) Vinyl Chloride	5.03	62	1108484	44.317	ng		100
7) 1,3-Butadiene	5.30	54	795060	45.789	ng		100
8) Bromomethane	5.75	94	638312	47.494	ng		100
9) Chloroethane	6.08	64	556878	45.999	ng		100
10) Ethanol	6.48	45	2636892	196.965	ng		99
11) Acetonitrile	6.72	41	1408027	41.391	ng		100
12) Acrolein	6.89	56	464898	45.731	ng		100
13) Acetone	7.11	58	2557610	201.307	ng		98
14) Trichlorofluoromethane	7.34	101	1089575	44.979	ng		99
15) 2-Propanol (Isopropanol)	7.62	45	3616133	87.184	ng		100
16) Acrylonitrile	7.87	53	1013677	45.999	ng		99
17) 1,1-Dichloroethene	8.30	96	698775	48.474	ng		99
18) 2-Methyl-2-Propanol (t...	8.48	59	2690319	80.332	ng		100
19) Methylene Chloride	8.53	84	707736	45.420	ng		99
20) 3-Chloro-1-propene (Al...	8.69	41	1142332	44.177	ng		99
21) Trichlorotrifluoroethane	8.94	151	631060	50.536	ng		98
22) Carbon Disulfide	8.79	76	2550056	43.619	ng		100
23) trans-1,2-Dichloroethene	9.79	61	1015382	47.643	ng		99
24) 1,1-Dichloroethane	10.05	63	1250216	44.827	ng		99
25) Methyl tert-Butyl Ether	10.14	73	895963	25.196	ng		100
26) Vinyl Acetate	10.31	86	891558	262.453	ng	#	83
27) 2-Butanone (MEK)	10.55	72	511935	49.354	ng		98
28) cis-1,2-Dichloroethene	11.06	61	944574	44.235	ng		100
29) Diisopropyl Ether	11.36	87	608150	43.419	ng	#	90
30) Ethyl Acetate	11.37	61	515793	96.203	ng		98
31) n-Hexane	11.34	57	1157684	41.889	ng		99
32) Chloroform	11.41	83	1130909	44.991	ng		100
34) Tetrahydrofuran (THF)	11.81	72	495727	46.382	ng		98
35) Ethyl tert-Butyl Ether	11.95	87	846919	49.134	ng		99
36) 1,2-Dichloroethane	12.21	62	831195	45.547	ng		100
38) 1,1,1-Trichloroethane	12.49	97	944056	45.985	ng		99
39) Isopropyl Acetate	12.91	61	903493	92.292	ng		97
40) 1-Butanol	12.94	56	1429335	98.054	ng		99
41) Benzene	12.97	78	2777091	42.200	ng		100
42) Carbon Tetrachloride	13.12	117	880696	47.755	ng		100
43) Cyclohexane	13.26	84	2090611	88.547	ng		99
44) tert-Amyl Methyl Ether	13.60	73	1996515	48.334	ng		100
45) 1,2-Dichloropropane	13.82	63	722242	45.273	ng		99
46) Bromodichloromethane	14.01	83	904884	48.771	ng		100
47) Trichloroethene	14.06	130	791195	49.805	ng		100
48) 1,4-Dioxane	14.03	88	616728	54.174	ng		99
49) 2,2,4-Trimethylpentane...	14.13	57	2974245	42.385	ng		99
50) Methyl Methacrylate	14.27	100	627030	112.506	ng		98

Quantitation Report (QT Reviewed)

Data File : I:\MS13\DATA\2020 03\11\03112034.D Vial: 16
Acq On : 11 Mar 2020 21:33 Operator: WA
Sample : 50ng R13031120 ICAL Std Inst : MS13
Misc : S31-01272001/S34-03112002 (4/9)

Quant Time: Mar 12 06:16:19 2020
Quant Method : I:\MS13\METHODS\R13031120.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Mar 12 06:15:40 2020
Response via : Initial Calibration
DataAcq Meth:TO15.M

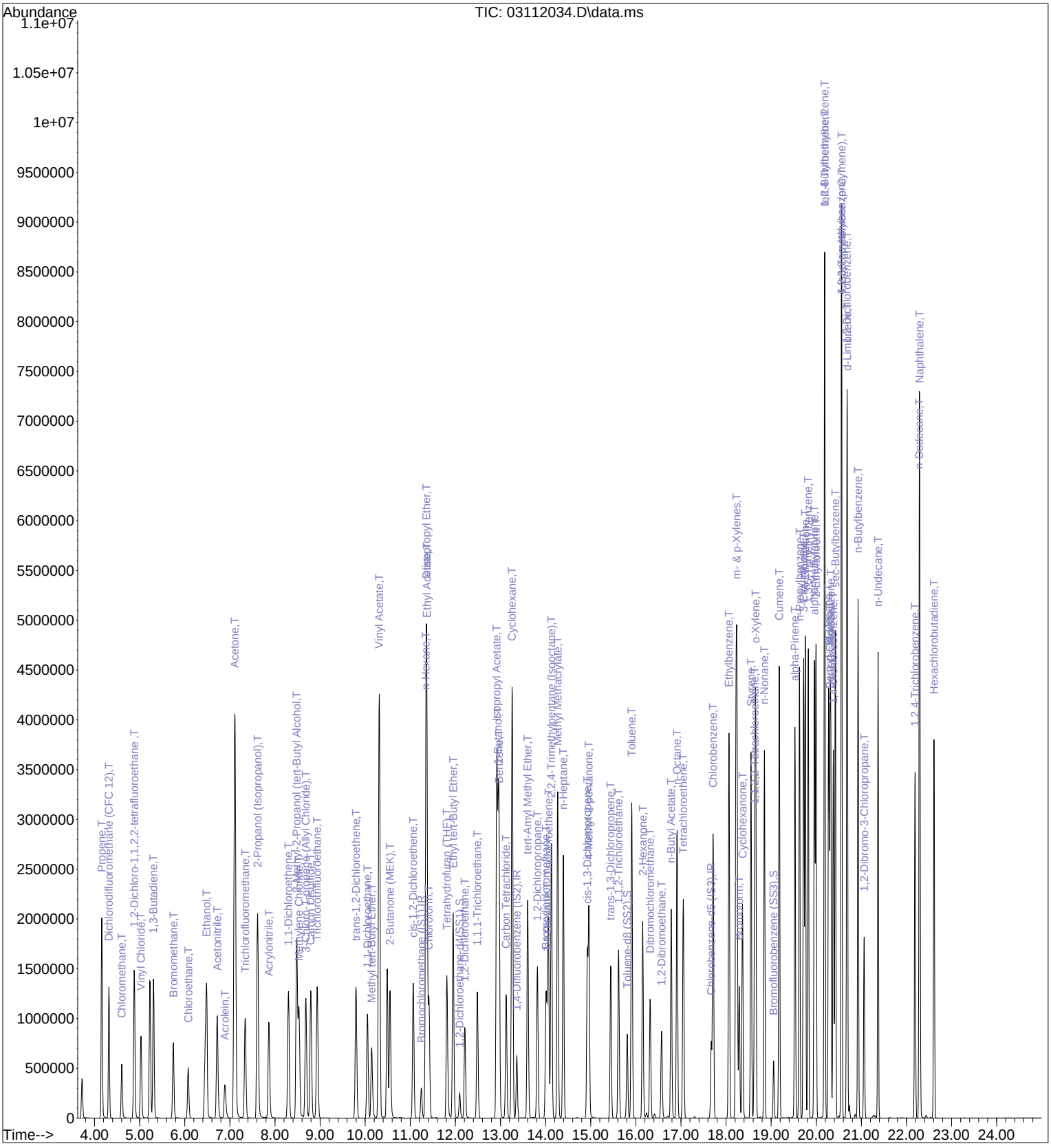
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.39	71	748666	46.230	ng	99
52) cis-1,3-Dichloropropene	14.92	75	1168808	49.304	ng	100
53) 4-Methyl-2-pentanone	14.96	58	681366	48.437	ng	99
54) trans-1,3-Dichloropropene	15.44	75	1045560	51.780	ng	100
55) 1,1,2-Trichloroethane	15.62	97	682405	47.651	ng	100
58) Toluene	15.91	91	2852617	46.711	ng	100
59) 2-Hexanone	16.15	43	1543411	49.953	ng	99
60) Dibromochloromethane	16.32	129	812557	54.362	ng	99
61) 1,2-Dibromoethane	16.57	107	772034	52.758	ng	100
62) n-Butyl Acetate	16.78	43	1763230	51.658	ng	99
63) n-Octane	16.91	57	621845	45.647	ng	99
64) Tetrachloroethene	17.05	166	857225	50.183	ng	100
65) Chlorobenzene	17.71	112	1921331	47.034	ng	99
66) Ethylbenzene	18.06	91	3151012	48.078	ng	99
67) m- & p-Xylenes	18.23	91	4833412	94.308	ng	100
68) Bromoform	18.29	173	738353	58.622	ng	100
69) Styrene	18.55	104	2057843	52.673	ng	99
70) o-Xylene	18.66	91	2480981	47.401	ng	99
71) n-Nonane	18.85	43	1353460	43.349	ng	98
72) 1,1,2,2-Tetrachloroethane	18.63	83	1186976	49.057	ng	100
74) Cumene	19.18	105	3194364	48.338	ng	99
75) alpha-Pinene	19.53	93	1666851	51.752	ng	100
76) n-Propylbenzene	19.63	91	3756769	47.974	ng	99
77) 3-Ethyltoluene	19.72	105	3152318	48.258	ng	99
78) 4-Ethyltoluene	19.75	105	3115227	49.808	ng	99
79) 1,3,5-Trimethylbenzene	19.82	105	2638699	47.875	ng	100
80) alpha-Methylstyrene	19.96	118	1514855	55.176	ng	100
81) 2-Ethyltoluene	19.99	105	3121754	48.534	ng	99
82) 1,2,4-Trimethylbenzene	20.19	105	2628293	49.996	ng	100
83) n-Decane	20.27	57	1440297	46.604	ng	99
84) Benzyl Chloride	20.30	91	2320425	55.283	ng	98
85) 1,3-Dichlorobenzene	20.32	146	1671155	51.658	ng	99
86) 1,4-Dichlorobenzene	20.38	146	1663937	50.383	ng	100
87) sec-Butylbenzene	20.43	105	3539855	48.500	ng	99
88) 4-Isopropyltoluene (p-...	20.56	119	3254298	50.513	ng	98
89) 1,2,3-Trimethylbenzene	20.56	105	2696326	51.335	ng	99
90) 1,2-Dichlorobenzene	20.68	146	1583200	51.582	ng	100
91) d-Limonene	20.69	68	1042443	51.526	ng	97
92) 1,2-Dibromo-3-Chloropr...	21.06	157	604000	54.291	ng	99
93) n-Undecane	21.37	57	1495248	45.446	ng	98
94) 1,2,4-Trichlorobenzene	22.19	180	1253211	53.892	ng	100
95) Naphthalene	22.29	128	3526024	54.267	ng	99
96) n-Dodecane	22.28	57	1332321	44.637	ng	98
97) Hexachlorobutadiene	22.61	225	817789	53.298	ng	100
98) Cyclohexanone	18.37	55	1005989	51.928	ng	99
99) tert-Butylbenzene	20.19	119	2573040	49.388	ng	99
100) n-Butylbenzene	20.93	91	2793446	49.968	ng	99

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data File : I:\MS13\DATA\2020 03\11\03112034.D Vial: 16
Acq On : 11 Mar 2020 21:33 Operator: WA
Sample : 50ng R13031120 ICAL Std Inst : MS13
Misc : S31-01272001/S34-03112002 (4/9)

Quant Time: Mar 12 06:16:19 2020
Quant Method : I:\MS13\METHODS\R13031120.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Mar 12 06:15:40 2020
Response via : Initial Calibration
DataAcq Meth:TO15.M



Quantitation Report (QT Reviewed)

Data File : I:\MS13\DATA\2020 03\11\03112035.D Vial: 16
Acq On : 11 Mar 2020 22:07 Operator: WA
Sample : 100ng R13031120 ICAL Std Inst : MS13
Misc : S31-01272001/S34-03112002 (4/9)

Quant Time: Mar 12 06:16:21 2020
Quant Method : I:\MS13\METHODS\R13031120.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Mar 12 06:15:40 2020
Response via : Initial Calibration
DataAcq Meth:TO15.M

WA 3/12/20

Internal Standards	R.T.	QIon	Response	Conc	Units		Dev(Min)
1) Bromochloromethane (IS1)	11.25	130	136759	12.500	ng		0.01
37) 1,4-Difluorobenzene (IS2)	13.36	114	625830	12.500	ng		0.00
56) Chlorobenzene-d5 (IS3)	17.67	82	272799	12.500	ng		0.00
System Monitoring Compounds							
33) 1,2-Dichloroethane-d4(...	12.11	65	190007	11.944	ng		0.02
Spiked Amount 12.500	Range 70 - 130		Recovery = 95.52%				
57) Toluene-d8 (SS2)	15.81	98	691396	12.625	ng		0.00
Spiked Amount 12.500	Range 70 - 130		Recovery = 100.96%				
73) Bromofluorobenzene (SS3)	19.06	174	198680	13.920	ng		0.00
Spiked Amount 12.500	Range 70 - 130		Recovery = 111.36%				
Target Compounds							Qvalue
2) Propene	4.17	42	1715953	82.849	ng		99
3) Dichlorodifluoromethan...	4.33	85	2433946	83.881	ng		99
4) Chloromethane	4.61	50	941555	42.437	ng		99
5) 1,2-Dichloro-1,1,2,2-t...	4.90	135	1499234	96.192	ng		100
6) Vinyl Chloride	5.04	62	2167366	87.569	ng		99
7) 1,3-Butadiene	5.32	54	1557518	90.652	ng		99
8) Bromomethane	5.76	94	1286745	96.756	ng		100
9) Chloroethane	6.09	64	1094965	91.405	ng		100
10) Ethanol	6.53	45	5063319	382.221	ng		99
11) Acetonitrile	6.75	41	2791420	82.929	ng		100
12) Acrolein	6.90	56	900955	89.566	ng		99
13) Acetone	7.14	58	4634839	368.674	ng		95
14) Trichlorofluoromethane	7.35	101	2149500	89.675	ng		99
15) 2-Propanol (Isopropanol)	7.65	45	6357494	154.904	ng		99
16) Acrylonitrile	7.89	53	1989558	91.240	ng		99
17) 1,1-Dichloroethene	8.31	96	1393956	97.725	ng		98
18) 2-Methyl-2-Propanol (t...	8.51	59	3890898	117.414	ng		100
19) Methylene Chloride	8.54	84	1399700	90.781	ng		96
20) 3-Chloro-1-propene (Al...	8.70	41	2211399	86.429	ng		98
21) Trichlorotrifluoroethane	8.94	151	1260843	102.040	ng		98
22) Carbon Disulfide	8.80	76	4965697	85.840	ng		99
23) trans-1,2-Dichloroethene	9.80	61	1989112	94.322	ng		99
24) 1,1-Dichloroethane	10.06	63	2442841	88.518	ng		99
25) Methyl tert-Butyl Ether	10.15	73	1305520	37.103	ng		100
26) Vinyl Acetate	10.33	86	1692039	503.379	ng	#	61
27) 2-Butanone (MEK)	10.56	72	1013635	98.758	ng		94
28) cis-1,2-Dichloroethene	11.08	61	1864285	88.232	ng		99
29) Diisopropyl Ether	11.37	87	1130955	81.602	ng	#	79
30) Ethyl Acetate	11.38	61	939442	177.079	ng		94
31) n-Hexane	11.35	57	2112161	77.235	ng		98
32) Chloroform	11.42	83	2240124	90.063	ng		100
34) Tetrahydrofuran (THF)	11.82	72	980298	92.692	ng		96
35) Ethyl tert-Butyl Ether	11.96	87	1676761	98.310	ng		96
36) 1,2-Dichloroethane	12.22	62	1647048	91.211	ng		100
38) 1,1,1-Trichloroethane	12.49	97	1844743	88.546	ng		99
39) Isopropyl Acetate	12.93	61	1682726	169.381	ng	#	91
40) 1-Butanol	12.97	56	2650365	179.164	ng		100
41) Benzene	12.97	78	5095449	76.299	ng		99
42) Carbon Tetrachloride	13.13	117	1729793	92.428	ng		100
43) Cyclohexane	13.27	84	3855569	160.916	ng		96
44) tert-Amyl Methyl Ether	13.61	73	3883576	92.647	ng		99
45) 1,2-Dichloropropane	13.82	63	1405113	86.793	ng		99
46) Bromodichloromethane	14.01	83	1787628	94.941	ng		99
47) Trichloroethene	14.07	130	1586206	98.393	ng		100
48) 1,4-Dioxane	14.04	88	1210957	104.820	ng		97
49) 2,2,4-Trimethylpentane...	14.13	57	5554506	78.000	ng		98
50) Methyl Methacrylate	14.28	100	1225959	216.758	ng		93

Data File : I:\MS13\DATA\2020 03\11\03112035.D Vial: 16
Acq On : 11 Mar 2020 22:07 Operator: WA
Sample : 100ng R13031120 ICAL Std Inst : MS13
Misc : S31-01272001/S34-03112002 (4/9)

Quant Time: Mar 12 06:16:21 2020
Quant Method : I:\MS13\METHODS\R13031120.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Mar 12 06:15:40 2020
Response via : Initial Calibration
DataAcq Meth:TO15.M

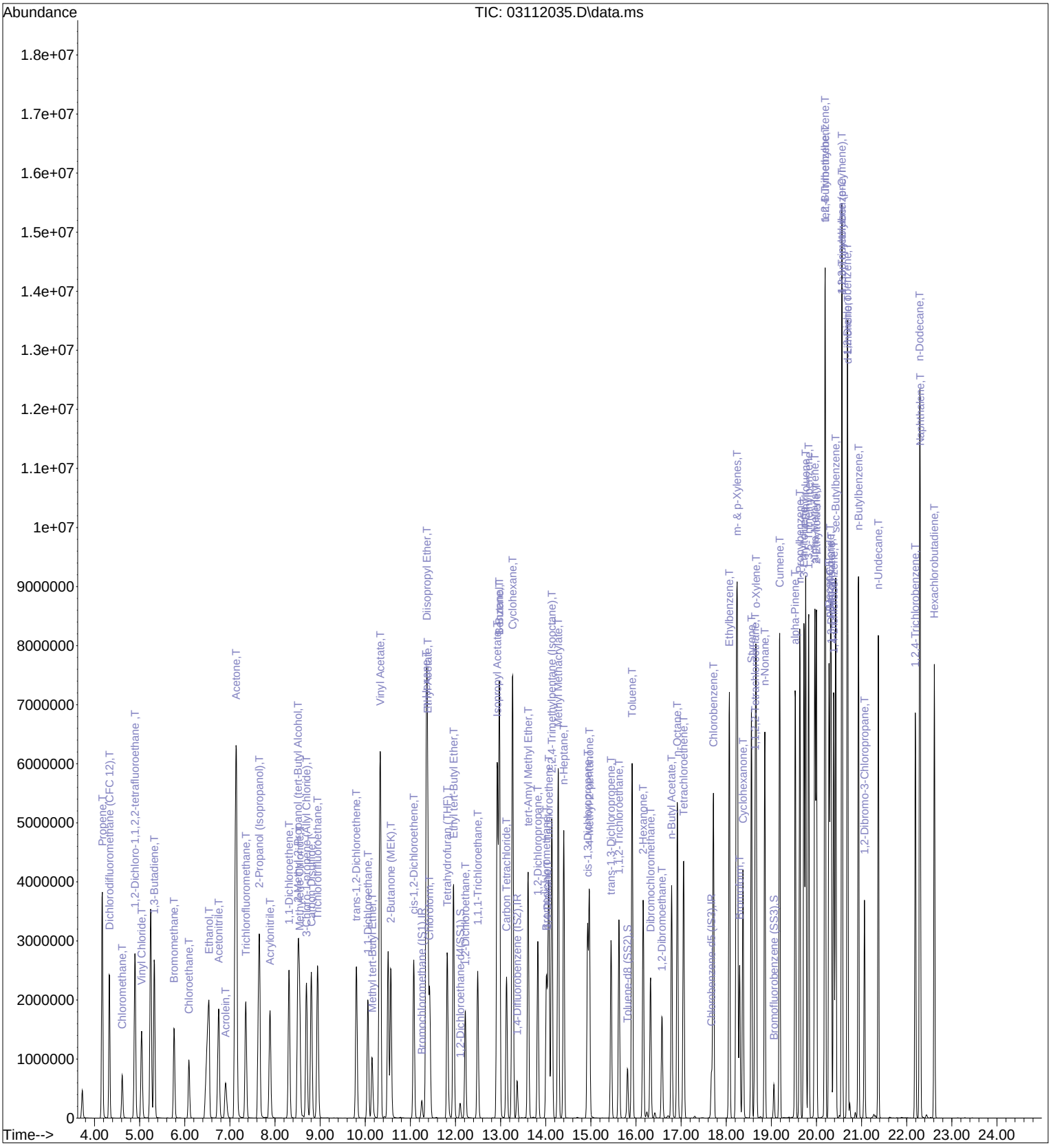
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.40	71	1444722	87.910	ng	98
52) cis-1,3-Dichloropropene	14.93	75	2278893	94.727	ng	99
53) 4-Methyl-2-pentanone	14.97	58	1314645	92.091	ng	96
54) trans-1,3-Dichloropropene	15.45	75	2077394	101.379	ng	100
55) 1,1,2-Trichloroethane	15.62	97	1357175	93.385	ng	99
58) Toluene	15.91	91	5437359	88.126	ng	99
59) 2-Hexanone	16.16	43	2951325	94.546	ng	98
60) Dibromochloromethane	16.32	129	1625637	107.649	ng	99
61) 1,2-Dibromoethane	16.57	107	1526697	103.262	ng	100
62) n-Butyl Acetate	16.79	43	3348008	97.086	ng	98
63) n-Octane	16.91	57	1180753	85.788	ng	97
64) Tetrachloroethene	17.06	166	1727664	100.106	ng	99
65) Chlorobenzene	17.72	112	3738118	90.574	ng	98
66) Ethylbenzene	18.07	91	5943411	89.758	ng	97
67) m- & p-Xylenes	18.24	91	9012999	174.062	ng	99
68) Bromoform	18.30	173	1494227	117.423	ng	99
69) Styrene	18.56	104	3967543	100.517	ng	98
70) o-Xylene	18.66	91	4710915	89.087	ng	99
71) n-Nonane	18.86	43	2432952	77.128	ng	94
72) 1,1,2,2-Tetrachloroethane	18.64	83	2235126	91.433	ng	100
74) Cumene	19.19	105	5950459	89.124	ng	97
75) alpha-Pinene	19.53	93	3182113	97.789	ng	99
76) n-Propylbenzene	19.63	91	6865551	86.778	ng	96
77) 3-Ethyltoluene	19.72	105	6103808	92.487	ng	97
78) 4-Ethyltoluene	19.76	105	5531044	87.531	ng	96
79) 1,3,5-Trimethylbenzene	19.83	105	4977330	89.384	ng	98
80) alpha-Methylstyrene	19.96	118	2928712	105.584	ng	99
81) 2-Ethyltoluene	20.00	105	5833304	89.764	ng	97
82) 1,2,4-Trimethylbenzene	20.19	105	4743728	89.316	ng	100
83) n-Decane	20.28	57	2579027	82.597	ng	96
84) Benzyl Chloride	20.31	91	4483011	105.715	ng	96
85) 1,3-Dichlorobenzene	20.33	146	3287976	100.599	ng	99
86) 1,4-Dichlorobenzene	20.39	146	3258213	97.650	ng	99
87) sec-Butylbenzene	20.43	105	6498129	88.123	ng	96
88) 4-Isopropyltoluene (p-...	20.56	119	5602022	86.066	ng	95
89) 1,2,3-Trimethylbenzene	20.56	105	4813989	90.717	ng	99
90) 1,2-Dichlorobenzene	20.68	146	2970818	95.803	ng	99
91) d-Limonene	20.69	68	1848578	90.439	ng	93
92) 1,2-Dibromo-3-Chloropr...	21.06	157	1223531	108.855	ng	98
93) n-Undecane	21.37	57	2674219	80.449	ng	96
94) 1,2,4-Trichlorobenzene	22.19	180	2505424	106.641	ng	99
95) Naphthalene	22.30	128	6460798	98.418	ng	98
96) n-Dodecane	22.29	57	2326467	77.148	ng	94
97) Hexachlorobutadiene	22.61	225	1668145	107.609	ng	100
98) Cyclohexanone	18.37	55	1934225	98.822	ng	98
99) tert-Butylbenzene	20.19	119	4606070	87.508	ng	97
100) n-Butylbenzene	20.93	91	5135318	90.921	ng	97

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data File : I:\MS13\DATA\2020 03\11\03112035.D Vial: 16
Acq On : 11 Mar 2020 22:07 Operator: WA
Sample : 100ng R13031120 ICAL Std Inst : MS13
Misc : S31-01272001/S34-03112002 (4/9)

Quant Time: Mar 12 06:16:21 2020
Quant Method : I:\MS13\METHODS\R13031120.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Mar 12 06:15:40 2020
Response via : Initial Calibration
DataAcq Meth:TO15.M



Quantitation Report (QT Reviewed)

Data File : I:\MS13\DATA\2020 03\11\03112037.D Vial: 1
Acq On : 11 Mar 2020 23:14 Operator: WA
Sample : 25ng R13031120 ICV Std Inst : MS13
Misc : S31-01272001/S31-03022003 (4/1)

Quant Time: Mar 12 07:34:28 2020
Quant Method : I:\MS13\METHODS\R13031120.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Mar 12 06:29:07 2020 3/12/20
Response via : Initial Calibration
DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.24	130	140052	12.500	ng	-0.01
37) 1,4-Difluorobenzene (IS2)	13.36	114	625112	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	17.67	82	274138	12.500	ng	0.00
System Monitoring Compounds						
33) 1,2-Dichloroethane-d4(...	12.09	65	191125	12.329	ng	-0.02
Spiked Amount 12.500	Range 70 - 130		Recovery = 98.64%			
57) Toluene-d8 (SS2)	15.80	98	693277	12.479	ng	0.00
Spiked Amount 12.500	Range 70 - 130		Recovery = 99.84%			
73) Bromofluorobenzene (SS3)	19.05	174	197807	12.539	ng	0.00
Spiked Amount 12.500	Range 70 - 130		Recovery = 100.32%			
Target Compounds						Qvalue
2) Propene	4.16	42	431147	26.192	ng	100
3) Dichlorodifluoromethan...	4.32	85	659804	25.927	ng	100
4) Chloromethane	4.60	50	439406	25.315	ng	99
5) 1,2-Dichloro-1,1,2,2-t...	4.87	135	379431	25.000	ng	100
6) Vinyl Chloride	5.03	62	566821	27.837	ng	100
7) 1,3-Butadiene	5.30	54	418166	30.356	ng	99
8) Bromomethane	5.74	94	320323	26.918	ng	100
9) Chloroethane	6.07	64	279250	26.127	ng	100
10) Ethanol	6.45	45	1433392	130.957	ng	100
11) Acetonitrile	6.70	41	752185	26.835	ng	100
12) Acrolein	6.88	56	245820	30.405	ng	100
13) Acetone	7.10	58	1407372	127.586	ng	100
14) Trichlorofluoromethane	7.33	101	557070	25.616	ng	99
15) 2-Propanol (Isopropanol)	7.60	45	1947043	57.589	ng	100
16) Acrylonitrile	7.85	53	534444	30.069	ng	100
17) 1,1-Dichloroethene	8.29	96	357874	27.603	ng	100
18) 2-Methyl-2-Propanol (t...	8.47	59	1720721	63.372	ng	100
19) Methylene Chloride	8.53	84	364119	26.559	ng	100
20) 3-Chloro-1-propene (Al...	8.68	41	574900	27.951	ng	100
21) Trichlorotrifluoroethane	8.94	151	320891	27.092	ng	99
22) Carbon Disulfide	8.79	76	1326979	24.634	ng	100
23) trans-1,2-Dichloroethene	9.79	61	526731	29.333	ng	100
24) 1,1-Dichloroethane	10.05	63	630203	26.879	ng	100
25) Methyl tert-Butyl Ether	10.14	73	567214	18.734	ng	100
26) Vinyl Acetate	10.30	86	464558	172.119	ng	99
27) 2-Butanone (MEK)	10.55	72	261513	29.371	ng	97
28) cis-1,2-Dichloroethene	11.06	61	496901	27.823	ng	99
29) Diisopropyl Ether	11.35	87	324522	25.942	ng	99
30) Ethyl Acetate	11.36	61	284066	57.818	ng	100
31) n-Hexane	11.34	57	638431	27.542	ng	100
32) Chloroform	11.41	83	587228	26.918	ng	99
34) Tetrahydrofuran (THF)	11.81	72	257746	28.102	ng	100
35) Ethyl tert-Butyl Ether	11.95	87	437519	29.413	ng	99
36) 1,2-Dichloroethane	12.21	62	427180	27.186	ng	100
38) 1,1,1-Trichloroethane	12.49	97	495407	27.112	ng	99
39) Isopropyl Acetate	12.91	61	486892	58.927	ng	100
40) 1-Butanol	12.93	56	753380	74.685	ng	99
41) Benzene	12.96	78	1466516	25.082	ng	100
42) Carbon Tetrachloride	13.12	117	447198	26.588	ng	100
43) Cyclohexane	13.26	84	1121820	54.043	ng	100
44) tert-Amyl Methyl Ether	13.60	73	1036265	29.226	ng	100
45) 1,2-Dichloropropane	13.81	63	378564	27.578	ng	99
46) Bromodichloromethane	14.01	83	462006	27.906	ng	100
47) Trichloroethene	14.06	130	406507	27.201	ng	100
48) 1,4-Dioxane	14.03	88	320678	31.168	ng	100
49) 2,2,4-Trimethylpentane...	14.13	57	1587950	27.108	ng	100
50) Methyl Methacrylate	14.26	100	325825	57.865	ng	100

Quantitation Report (QT Reviewed)

Data File : I:\MS13\DATA\2020 03\11\03112037.D Vial: 1
Acq On : 11 Mar 2020 23:14 Operator: WA
Sample : 25ng R13031120 ICV Std Inst : MS13
Misc : S31-01272001/S31-03022003 (4/1)

Quant Time: Mar 12 07:34:28 2020
Quant Method : I:\MS13\METHODS\R13031120.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Mar 12 06:29:07 2020
Response via : Initial Calibration
DataAcq Meth:TO15.M

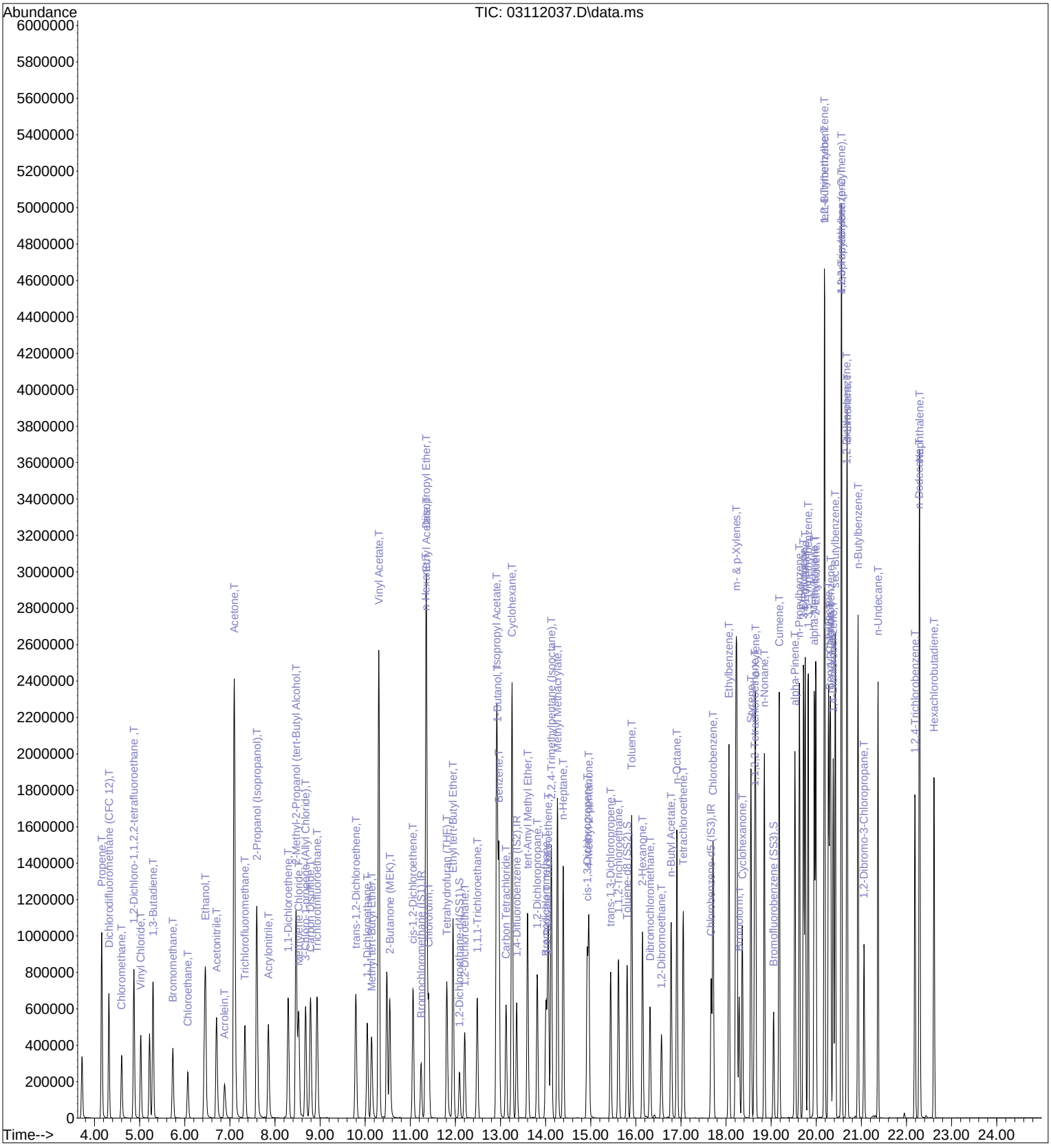
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.39	71	391604	27.842	ng	100
52) cis-1,3-Dichloropropene	14.92	75	641749	29.169	ng	100
53) 4-Methyl-2-pentanone	14.96	58	356965	28.777	ng	99
54) trans-1,3-Dichloropropene	15.44	75	544943	29.674	ng	100
55) 1,1,2-Trichloroethane	15.62	97	356232	27.851	ng	100
58) Toluene	15.91	91	1506687	26.746	ng	100
59) 2-Hexanone	16.15	43	818914	29.478	ng	100
60) Dibromochloromethane	16.32	129	414678	28.649	ng	99
61) 1,2-Dibromoethane	16.57	107	403051	29.562	ng	100
62) n-Butyl Acetate	16.78	43	924524	31.310	ng	100
63) n-Octane	16.91	57	330681	28.285	ng	99
64) Tetrachloroethene	17.05	166	437375	26.101	ng	100
65) Chlorobenzene	17.71	112	1013704	26.281	ng	100
66) Ethylbenzene	18.06	91	1676540	27.923	ng	100
67) m- & p-Xylenes	18.23	91	2568915	54.582	ng	100
68) Bromoform	18.29	173	373815	29.941	ng	100
69) Styrene	18.55	104	1088475	30.511	ng	100
70) o-Xylene	18.66	91	1308912	27.616	ng	100
71) n-Nonane	18.85	43	736960	27.937	ng	100
72) 1,1,2,2-Tetrachloroethane	18.63	83	633336	28.075	ng	99
74) Cumene	19.18	105	1680959	27.302	ng	100
75) alpha-Pinene	19.53	93	847901	29.270	ng	99
76) n-Propylbenzene	19.62	91	1997010	27.850	ng	100
77) 3-Ethyltoluene	19.71	105	1745776	28.749	ng	100
78) 4-Ethyltoluene	19.75	105	1543789	26.538	ng	100
79) 1,3,5-Trimethylbenzene	19.82	105	1388735	26.933	ng	100
80) alpha-Methylstyrene	19.95	118	782459	30.825	ng	100
81) 2-Ethyltoluene	19.99	105	1638150	27.285	ng	100
82) 1,2,4-Trimethylbenzene	20.18	105	1403191	28.101	ng	100
83) n-Decane	20.27	57	772813	27.418	ng	100
84) Benzyl Chloride	20.30	91	1195021	32.699	ng	100
85) 1,3-Dichlorobenzene	20.32	146	866201	27.988	ng	99
86) 1,4-Dichlorobenzene	20.37	146	877782	28.125	ng	100
87) sec-Butylbenzene	20.42	105	1869736	27.408	ng	100
88) 4-Isopropyltoluene (p-...	20.56	119	1744404	28.132	ng	100
89) 1,2,3-Trimethylbenzene	20.56	105	1384596	27.534	ng	100
90) 1,2-Dichlorobenzene	20.68	146	830278	28.128	ng	100
91) d-Limonene	20.69	68	551119	30.682	ng	100
92) 1,2-Dibromo-3-Chloropr...	21.06	157	305198	29.004	ng	99
93) n-Undecane	21.37	57	780669	29.245	ng	100
94) 1,2,4-Trichlorobenzene	22.19	180	639829	31.303	ng	99
95) Naphthalene	22.29	128	1916970	31.427	ng	100
96) n-Dodecane	22.28	57	581563	26.358	ng	100
97) Hexachlorobutadiene	22.61	225	408662	26.666	ng	100
98) Cyclohexanone	18.36	55	502027	30.469	ng	100
99) tert-Butylbenzene	20.18	119	1367564	27.334	ng	100
100) n-Butylbenzene	20.93	91	1489006	28.805	ng	100

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data File : I:\MS13\DATA\2020 03\11\03112037.D Vial: 1
Acq On : 11 Mar 2020 23:14 Operator: WA
Sample : 25ng R13031120 ICV Std Inst : MS13
Misc : S31-01272001/S31-03022003 (4/1)

Quant Time: Mar 12 07:34:28 2020
Quant Method : I:\MS13\METHODS\R13031120.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Mar 12 06:29:07 2020
Response via : Initial Calibration
DataAcq Meth:TO15.M



Initial Calibration Verification/LABORATORY CONTROL SAMPLE CHECK SHEET

Data File Name: **03112037.D** Acq. Method File: **TO15.M** WA 3/12/20
Data File Path: **I:\MS13\DATA\2020_03\11** Sample Name: **25ng R13031120 ICV Std**
Operator: **WA** Misc Info: **S31-01272001/S31-03022003 (**
Date Acquired: **3/11/2020 23:14** Instrument Name: **MS13**

#	Compound Name	Ret. Time	Amt. (ng)	Spike Amt.(ng)	% Rec.	Lower Limit	Upper Limit	* OR Fail	ICV/AZ 70-130%
2)	**Propene**	**4.16**	**26.2**	26.25	100	**51**	**133**	*	*
3)	**Dichlorodifluoromethane (CFC 1**	**4.32**	**25.9**	**26.25**	99	**64**	**115**	*	*
4)	**Chloromethane**	**4.60**	**25.3**	**26.50**	95	**49**	**127**	*	*
5)	**1,2-Dichloro-1,1,2,2-tetrafluoroet**	**4.87**	**25.0**	**25.75**	97	**65**	**114**	*	*
6)	**Vinyl Chloride**	**5.03**	**27.8**	**26.50**	105	**61**	**129**	*	*
7)	**1,3-Butadiene**	**5.30**	**30.4**	**26.50**	115	**54**	**140**	*	*
8)	**Bromomethane**	**5.74**	**26.9**	**26.50**	102	**68**	**120**	*	*
9)	**Chloroethane**	**6.07**	**26.1**	**26.75**	98	**63**	**123**	*	*
10)	**Ethanol**	**6.45**	**131**	**132.50**	99	**49**	**134**	*	*
11)	**Acetonitrile**	**6.70**	**26.8**	**26.75**	100	**50**	**137**	*	*
12)	**Acrolein**	**6.88**	**30.4**	**25.75**	118	**62**	**128**	*	*
13)	**Acetone**	**7.10**	**128**	**133.50**	96	**56**	**125**	*	*
14)	**Trichlorofluoromethane**	**7.33**	**25.6**	**26.50**	97	**64**	**115**	*	*
15)	**2-Propanol (Isopropanol)**	**7.60**	**57.6**	**52.75**	109	**57**	**133**	*	*
16)	**Acrylonitrile**	**7.85**	**30.1**	**26.50**	114	**64**	**136**	*	*
17)	**1,1-Dichloroethene**	**8.29**	**27.6**	**26.75**	103	**68**	**115**	*	*
18)	2-Methyl-2-Propanol (tert-Butyl Alc	8.47	63.4	53.75	118	56	132	*	*
19)	**Methylene Chloride**	**8.53**	**26.6**	**26.25**	101	**68**	**114**	*	*
20)	**3-Chloro-1-propene (Allyl Chloric**	**8.68**	**28.0**	**26.75**	105	**55**	**139**	*	*
21)	**Trichlorotrifluoroethane**	**8.94**	**27.1**	**27.00**	100	**65**	**115**	*	*
22)	**Carbon Disulfide**	**8.79**	**24.6**	**26.50**	93	**68**	**113**	*	*
23)	**trans-1,2-Dichloroethene**	**9.79**	**29.3**	**26.75**	110	**65**	**122**	*	*
24)	**1,1-Dichloroethane**	**10.05**	**26.9**	**26.50**	102	**63**	**118**	*	*
25)	**Methyl tert-Butyl Ether**	**10.14**	**18.7**	**26.75**	70	**57**	**131**	*	*
26)	**Vinyl Acetate**	**10.30**	**172**	**133.25**	129	**71**	**128**	**FAIL**	*
27)	**2-Butanone (MEK)**	**10.55**	**29.4**	**26.50**	111	**67**	**123**	*	*
28)	**cis-1,2-Dichloroethene**	**11.06**	**27.8**	**26.50**	105	**64**	**120**	*	*
29)	Diisopropyl Ether	11.35	25.9	27.00	96	62	121	*	*
30)	**Ethyl Acetate**	**11.36**	**57.8**	**54.00**	107	**64**	**131**	*	*
31)	**n-Hexane**	**11.34**	**27.5**	**27.00**	102	**58**	**125**	*	*
32)	**Chloroform**	**11.41**	**26.9**	**26.75**	101	**65**	**114**	*	*
34)	**Tetrahydrofuran (THF)**	**11.81**	**28.1**	**27.50**	102	**65**	**115**	*	*
35)	Ethyl tert-Butyl Ether	11.95	29.4	26.75	110	61	130	*	*
36)	**1,2-Dichloroethane**	**12.21**	**27.2**	**26.75**	102	**59**	**120**	*	*
38)	**1,1,1-Trichloroethane**	**12.49**	**27.1**	**26.75**	101	**66**	**115**	*	*
39)	Isopropyl Acetate	12.91	58.9	52.50	112	65	129	*	*
40)	1-Butanol	12.93	74.7	53.25	140	58	140	*	FAIL
41)	**Benzene**	**12.96**	**25.1**	**26.25**	96	**66**	**109**	*	*
42)	**Carbon Tetrachloride**	**13.12**	**26.6**	**26.00**	102	**66**	**119**	*	*
43)	**Cyclohexane**	**13.26**	**54.0**	**52.75**	102	**67**	**117**	*	*
44)	tert-Amyl Methyl Ether	13.60	29.2	**26.75**	109	62	133	*	*
45)	**1,2-Dichloropropane**	**13.81**	**27.6**	**26.75**	103	**66**	**119**	*	*
46)	**Bromodichloromethane**	**14.01**	**27.9**	**27.25**	102	**71**	**119**	*	*
47)	**Trichloroethene**	**14.06**	**27.2**	**27.00**	101	**70**	**114**	*	*
48)	**1,4-Dioxane**	**14.03**	**31.2**	**27.00**	116	**71**	**117**	*	*
49)	2,2,4-Trimethylpentane (Isooctane)	14.13	27.1	26.75	101	61	122	*	*

Initial Calibration Verification/LABORATORY CONTROL SAMPLE CHECK SHEET

Data File Name: **03112037.D** **TO15.M**
Data File Path: **I:\MS13\DATA\2020_03\11** Sample Name: **25ng R13031120 ICV Std**
Operator: **WA** Misc Info: **S31-01272001/S31-03022003 (**
Date Acquired: **3/11/2020 23:14** Instrument Name: **MS13**

#	Compound Name	Ret. Time	Amt. (ng)	Spike Amt.(ng)	% Rec.	Lower Limit	Upper Limit	* OR Fail	ICV/AZ 70-130%
50)	**Methyl Methacrylate**	**14.26**	**57.9**	**53.75**	108	**76**	**121**	*	*
51)	**n-Heptane**	**14.39**	**27.8**	**26.75**	104	**66**	**119**	*	*
52)	**cis-1,3-Dichloropropene**	**14.92**	**29.2**	**26.75**	109	**72**	**125**	*****	*
53)	**4-Methyl-2-pentanone**	**14.96**	**28.8**	**26.50**	109	**68**	**130**	*****	*
54)	**trans-1,3-Dichloropropene**	**15.44**	**29.7**	**26.50**	112	**71**	**132**	*****	*
55)	**1,1,2-Trichloroethane**	**15.62**	**27.9**	**26.75**	104	**70**	**117**	*****	*
58)	**Toluene**	**15.91**	**26.7**	**26.50**	101	**67**	**113**	*****	*
59)	**2-Hexanone**	**16.15**	**29.5**	**27.00**	109	**62**	**135**	*****	*
60)	**Dibromochloromethane**	**16.32**	**28.6**	**26.75**	107	**73**	**126**	*****	*
61)	**1,2-Dibromoethane**	**16.57**	**29.6**	**26.75**	111	**71**	**122**	*****	*
62)	**n-Butyl Acetate**	**16.78**	**31.3**	**27.25**	115	**65**	**134**	*****	*
63)	**n-Octane**	**16.91**	**28.3**	**27.00**	105	**63**	**120**	*	*
64)	**Tetrachloroethene**	**17.05**	**26.1**	**26.00**	100	**64**	**120**	*****	*
65)	**Chlorobenzene**	**17.71**	**26.3**	**26.75**	98	**65**	**116**	*****	*
66)	**Ethylbenzene**	**18.06**	**27.9**	**26.50**	105	**65**	**117**	*****	*
67)	**m- & p-Xylenes**	**18.23**	**54.6**	**53.25**	103	**64**	**121**	*****	*
68)	**Bromoform**	**18.29**	**29.9**	**26.75**	112	**72**	**130**	*****	*
69)	**Styrene**	**18.55**	**30.5**	**26.50**	115	**72**	**126**	*****	*
70)	**o-Xylene**	**18.66**	**27.6**	**26.75**	103	**64**	**120**	*****	*
71)	**n-Nonane**	**18.85**	**27.9**	**26.75**	104	**56**	**132**	*****	*
72)	**1,1,2,2-Tetrachloroethane**	**18.63**	**28.1**	**26.75**	105	**66**	**122**	*****	*
74)	**Cumene**	**19.18**	**27.3**	**26.75**	102	**64**	**121**	*****	*
75)	**alpha-Pinene**	**19.53**	**29.3**	**26.50**	111	**62**	**136**	*****	*
76)	**n-Propylbenzene**	**19.62**	**27.8**	**26.75**	104	**65**	**123**	*	*
77)	3-Ethyltoluene	19.71	28.7	26.75	107	62	123	*	*
78)	**4-Ethyltoluene**	**19.75**	**26.5**	**26.25**	**101**	**71**	**126**	*****	*****
79)	**1,3,5-Trimethylbenzene**	**19.82**	**26.9**	**26.50**	**102**	**65**	**120**	*****	*****
80)	alpha-Methylstyrene	19.95	30.8	26.50	**116**	70	132	*	*****
81)	2-Ethyltoluene	19.99	27.3	26.75	**102**	66	121	*	*****
82)	**1,2,4-Trimethylbenzene**	**20.18**	**28.1**	**26.50**	**106**	**63**	**129**	*****	*****
83)	n-Decane	20.27	27.4	26.75	**102**	61	131	*	*****
84)	**Benzyl Chloride**	**20.30**	**32.7**	**26.75**	**122**	**66**	**138**	*****	*****
85)	**1,3-Dichlorobenzene**	**20.32**	**28.0**	**26.75**	**105**	**65**	**127**	*****	*****
86)	**1,4-Dichlorobenzene**	**20.37**	**28.1**	**26.75**	**105**	**66**	**125**	*****	*****
87)	sec-Butylbenzene	20.42	27.4	26.50	**103**	68	123	*	*****
88)	4-Isopropyltoluene (p-Cymene)	20.56	28.1	27.25	**103**	61	129	*	*****
89)	1,2,3-Trimethylbenzene	20.56	27.5	27.00	**102**	60	134	*	*****
90)	**1,2-Dichlorobenzene**	**20.68**	**28.1**	**26.75**	**105**	**67**	**128**	*****	*****
91)	**d-Limonene**	**20.69**	**30.7**	**26.50**	**116**	**65**	**136**	*****	*****
92)	**1,2-Dibromo-3-Chloropropane**	**21.06**	**29.0**	**26.75**	**108**	**73**	**133**	*****	*****
93)	n-Undecane	21.37	29.2	27.00	**108**	64	131	*	*****
94)	**1,2,4-Trichlorobenzene**	**22.19**	**31.3**	**27.00**	**116**	**62**	**140**	*****	*****
95)	**Naphthalene**	**22.29**	**31.4**	**26.50**	**118**	**57**	**149**	*****	*****
96)	n-Dodecane	22.28	26.4	26.50	**100**	41	181	*	*****
97)	**Hexachlorobutadiene**	**22.61**	**26.7**	**26.75**	**100**	57	129	*	*****
98)	Cyclohexanone	18.36	30.5	25.25	121	61	131	*	*****
99)	tert-Butylbenzene	20.18	27.3	26.50	103	62	130	*	*****
100)	n-Butylbenzene	20.93	28.8	26.75	108	67	124	*	*****

Bold = 75 Compound List

 *** = Pass I:\MS13\0-Instrument Info\0-Security Certificates\ICV_LCS_2019_10111902.CRT** 3/12/2020 7:35 AM

Evaluate Continuing Calibration Report

Data File : I:\MS13\DATA\2020 03\12\03122002.D Vial: 15
Acq On : 12 Mar 2020 00:55 Operator: WA
Sample : CCV R13031220 5ng Inst : MS13
Misc : S31-01272001/S34-03062003 (4/4)

Quant Time: Mar 12 07:01:02 2020
Quant Method : I:\MS13\METHODS\R13031120.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Mar 12 06:29:07 2020
Response via : Initial Calibration
DataAcq Meth:TO15.M

WA 3/12/20

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.33min
Max. RRF Dev : 30% Max. Rel. Area : 200%

		Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
1	IR	Bromochloromethane (IS1)	1.000	1.000	0.0	106	-0.02
2	T	Propene	1.469	1.485	-1.1	103	0.00
3	T	Dichlorodifluoromethane (CF	2.271	2.217	2.4	101	0.00
4	T	Chloromethane	1.549	1.305	15.8	97	0.00
5	T	1,2-Dichloro-1,1,2,2-tetraf	1.355	1.313	3.1	103	-0.02
6	T	Vinyl Chloride	1.817	1.905	-4.8	105	-0.02
7	T	1,3-Butadiene	1.229	1.326	-7.9	107	-0.03
8	T	Bromomethane	1.062	1.109	-4.4	104	-0.03
9	T	Chloroethane	0.954	0.952	0.2	102	-0.03
10	T	Ethanol	0.977	0.934	4.4	104	-0.11
11	T	Acetonitrile	2.502	2.525	-0.9	104	-0.06
12	T	Acrolein	0.722	0.771	-6.8	102	-0.03
13	T	Acetone	0.985	0.989	-0.4	103	-0.06
14	T	Trichlorofluoromethane	1.941	1.882	3.0	102	-0.02
15	T	2-Propanol (Isopropanol)	3.018	3.120	-3.4	105	-0.07
16	T	Acrylonitrile	1.586	1.773	-11.8	104	-0.05
17	T	1,1-Dichloroethene	1.157	1.164	-0.6	103	-0.02
18	T	2-Methyl-2-Propanol (tert-B	2.423	2.417	0.2	101	-0.05
19	T	Methylene Chloride	1.224	1.213	0.9	102	-0.03
20	T	3-Chloro-1-propene (Allyl C	1.836	1.876	-2.2	102	-0.03
21	T	Trichlorotrifluoroethane	1.057	1.038	1.8	100	-0.01
22	T	Carbon Disulfide	4.808	4.319	10.2	100	-0.03
23	T	trans-1,2-Dichloroethene	1.603	1.680	-4.8	103	-0.02
24	T	1,1-Dichloroethane	2.093	2.122	-1.4	104	-0.02
25	T	Methyl tert-Butyl Ether	2.702	2.740	-1.4	104	-0.01
26	T	Vinyl Acetate	0.241	0.204	15.4	103	-0.04
27	T	2-Butanone (MEK)	0.795	0.860	-8.2	104	-0.02
28	T	cis-1,2-Dichloroethene	1.594	1.626	-2.0	104	-0.02
29	T	Diisopropyl Ether	1.116	1.225	-9.8	104	-0.01
30	T	Ethyl Acetate	0.439	0.499	-13.7	104	-0.02
31	T	n-Hexane	2.069	2.173	-5.0	104	-0.01
32	T	Chloroform	1.947	1.934	0.7	103	-0.03
33	S	1,2-Dichloroethane-d4(SS1)	1.384	1.369	1.1	104	-0.02
34	T	Tetrahydrofuran (THF)	0.819	0.826	-0.9	104	0.00
35	T	Ethyl tert-Butyl Ether	1.328	1.414	-6.5	106	-0.01
36	T	1,2-Dichloroethane	1.402	1.393	0.6	102	-0.02
37	IR	1,4-Difluorobenzene (IS2)	1.000	1.000	0.0	106	-0.01
38	T	1,1,1-Trichloroethane	0.365	0.358	1.9	103	-0.01
39	T	Isopropyl Acetate	0.165	0.181	-9.7	105	-0.01
40	T	1-Butanol	0.202	0.164	18.8	109	-0.04
41	T	Benzene	1.169	1.122	4.0	103	-0.01
42	T	Carbon Tetrachloride	0.336	0.325	3.3	102	-0.01
43	T	Cyclohexane	0.415	0.420	-1.2	103	-0.02
44	T	tert-Amyl Methyl Ether	0.709	0.746	-5.2	106	-0.01
45	T	1,2-Dichloropropane	0.274	0.277	-1.1	105	-0.01
46	T	Bromodichloromethane	0.331	0.332	-0.3	103	-0.01
47	T	Trichloroethene	0.299	0.292	2.3	103	-0.01
48	T	1,4-Dioxane	0.206	0.218	-5.8	105	0.00
49	T	2,2,4-Trimethylpentane (Iso	1.171	1.190	-1.6	104	-0.01
50	T	Methyl Methacrylate	0.113	0.111	1.8	103	-0.02
51	T	n-Heptane	0.281	0.291	-3.6	106	-0.01
52	T	cis-1,3-Dichloropropene	0.440	0.439	0.2	105	0.00
53	T	4-Methyl-2-pentanone	0.248	0.251	-1.2	105	-0.01
54	T	trans-1,3-Dichloropropene	0.367	0.375	-2.2	106	0.00
55	T	1,1,2-Trichloroethane	0.256	0.260	-1.6	105	-0.01

Data File : I:\MS13\DATA\2020 03\12\03122002.D Vial: 15
Acq On : 12 Mar 2020 00:55 Operator: WA
Sample : CCV R13031220 5ng Inst : MS13
Misc : S31-01272001/S34-03062003 (4/4)

Quant Time: Mar 12 07:01:02 2020
Quant Method : I:\MS13\METHODS\R13031120.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Mar 12 06:29:07 2020
Response via : Initial Calibration
DataAcq Meth:TO15.M

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.33min
Max. RRF Dev : 30% Max. Rel. Area : 200%

		Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
56	IR	Chlorobenzene-d5 (IS3)	1.000	1.000	0.0	106	0.00
57	S	Toluene-d8 (SS2)	2.533	2.539	-0.2	106	0.00
58	T	Toluene	2.569	2.555	0.5	104	0.00
59	T	2-Hexanone	1.267	1.297	-2.4	105	0.00
60	T	Dibromochloromethane	0.660	0.667	-1.1	103	0.00
61	T	1,2-Dibromoethane	0.622	0.654	-5.1	105	0.00
62	T	n-Butyl Acetate	1.346	1.527	-13.4	106	0.00
63	T	n-Octane	0.533	0.562	-5.4	105	0.00
64	T	Tetrachloroethene	0.764	0.747	2.2	105	0.00
65	T	Chlorobenzene	1.759	1.689	4.0	104	0.00
66	T	Ethylbenzene	2.738	2.813	-2.7	103	0.00
67	T	m- & p-Xylenes	2.146	2.152	-0.3	103	-0.02
68	T	Bromoform	0.569	0.576	-1.2	104	0.00
69	T	Styrene	1.627	1.727	-6.1	104	0.00
70	T	o-Xylene	2.161	2.206	-2.1	104	-0.01
71	T	n-Nonane	1.203	1.290	-7.2	105	0.00
72	T	1,1,2,2-Tetrachloroethane	1.029	1.026	0.3	103	0.00
73	S	Bromofluorobenzene (SS3)	0.719	0.708	1.5	104	0.00
74	T	Cumene	2.807	2.835	-1.0	104	0.00
75	T	alpha-Pinene	1.321	1.343	-1.7	103	0.00
76	T	n-Propylbenzene	3.270	3.369	-3.0	103	0.00
77	T	3-Ethyltoluene	2.769	2.958	-6.8	113	0.00
78	T	4-Ethyltoluene	2.653	2.566	3.3	94	0.00
79	T	1,3,5-Trimethylbenzene	2.351	2.319	1.4	103	-0.01
80	T	alpha-Methylstyrene	1.157	1.135	1.9	103	-0.01
81	T	2-Ethyltoluene	2.738	2.733	0.2	104	-0.01
82	T	1,2,4-Trimethylbenzene	2.277	2.325	-2.1	104	-0.01
83	T	n-Decane	1.285	1.342	-4.4	104	0.00
84	T	Benzyl Chloride	1.666	1.396	16.2	108	-0.01
85	T	1,3-Dichlorobenzene	1.411	1.387	1.7	104	-0.01
86	T	1,4-Dichlorobenzene	1.423	1.392	2.2	104	-0.01
87	T	sec-Butylbenzene	3.111	3.142	-1.0	104	0.00
88	T	4-Isopropyltoluene (p-Cymen	2.827	2.898	-2.5	104	0.00
89	T	1,2,3-Trimethylbenzene	2.293	2.305	-0.5	102	0.00
90	T	1,2-Dichlorobenzene	1.346	1.329	1.3	104	0.00
91	T	d-Limonene	0.819	0.848	-3.5	105	-0.01
92	T	1,2-Dibromo-3-Chloropropane	0.480	0.450	6.2	104	0.00
93	T	n-Undecane	1.217	1.317	-8.2	104	0.00
94	T	1,2,4-Trichlorobenzene	0.932	0.955	-2.5	104	0.00
95	T	Naphthalene	2.781	2.698	3.0	104	0.00
96	T	n-Dodecane	1.006	1.095	-8.8	104	0.00
97	T	Hexachlorobutadiene	0.699	0.641	8.3	102	0.00
98	T	Cyclohexanone	0.751	0.650	13.4	104	-0.01
99	T	tert-Butylbenzene	2.281	2.295	-0.6	103	-0.01
100	T	n-Butylbenzene	2.357	2.440	-3.5	103	0.00

(#) = Out of Range SPCC's out = 0 CCC's out = 0

Quantitation Report (QT Reviewed)

Data File : I:\MS13\DATA\2020 03\12\03122002.D Vial: 15
Acq On : 12 Mar 2020 00:55 Operator: WA
Sample : CCV R13031220 5ng Inst : MS13
Misc : S31-01272001/S34-03062003 (4/4)

Quant Time: Mar 12 07:01:02 2020
Quant Method : I:\MS13\METHODS\R13031120.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Mar 12 06:29:07 2020
Response via : Initial Calibration
DataAcq Meth:TO15.M

WA 3/12/20

Internal Standards	R.T.	QIon	Response	Conc	Units		Dev(Min)
1) Bromochloromethane (IS1)	11.23	130	137420	12.500	ng		-0.02
37) 1,4-Difluorobenzene (IS2)	13.35	114	617774	12.500	ng		-0.01
56) Chlorobenzene-d5 (IS3)	17.67	82	270435	12.500	ng		0.00
System Monitoring Compounds							
33) 1,2-Dichloroethane-d4(...	12.08	65	188082	12.365	ng		-0.02
Spiked Amount 12.500	Range 70 - 130		Recovery = 98.96%				
57) Toluene-d8 (SS2)	15.80	98	686514	12.527	ng		0.00
Spiked Amount 12.500	Range 70 - 130		Recovery = 100.24%				
73) Bromofluorobenzene (SS3)	19.05	174	191373	12.297	ng		0.00
Spiked Amount 12.500	Range 70 - 130		Recovery = 98.40%				
Target Compounds							Qvalue
2) Propene	4.17	42	86514	5.356	ng		99
3) Dichlorodifluoromethan...	4.33	85	129192	5.174	ng		100
4) Chloromethane	4.60	50	76045	4.747	ng		100
5) 1,2-Dichloro-1,1,2,2-t...	4.87	135	75779	5.089	ng		99
6) Vinyl Chloride	5.03	62	113084	5.660	ng		99
7) 1,3-Butadiene	5.29	54	77268	5.717	ng		99
8) Bromomethane	5.73	94	65813	5.636	ng		99
9) Chloroethane	6.06	64	56538	5.391	ng		100
10) Ethanol	6.42	45	267412	24.899	ng		100
11) Acetonitrile	6.69	41	145725	5.298	ng		99
12) Acrolein	6.88	56	43679	5.506	ng		100
13) Acetone	7.08	58	289741	26.770	ng		98
14) Trichlorofluoromethane	7.33	101	109682	5.140	ng		100
15) 2-Propanol (Isopropanol)	7.58	45	360144	10.856	ng		98
16) Acrylonitrile	7.84	53	102326	5.867	ng		100
17) 1,1-Dichloroethene	8.29	96	69114	5.433	ng		99
18) 2-Methyl-2-Propanol (t...	8.46	59	287028	10.773	ng		99
19) Methylene Chloride	8.51	84	70656	5.252	ng		99
20) 3-Chloro-1-propene (Al...	8.67	41	111391	5.519	ng		99
21) Trichlorotrifluoroethane	8.93	151	61638	5.304	ng		99
22) Carbon Disulfide	8.78	76	254018	4.806	ng		100
23) trans-1,2-Dichloroethene	9.78	61	99733	5.660	ng		99
24) 1,1-Dichloroethane	10.03	63	127110	5.525	ng		100
25) Methyl tert-Butyl Ether	10.14	73	162633	5.474	ng		99
26) Vinyl Acetate	10.29	86	60117	22.700	ng	#	78
27) 2-Butanone (MEK)	10.55	72	50132	5.738	ng		94
28) cis-1,2-Dichloroethene	11.05	61	94740	5.406	ng		100
29) Diisopropyl Ether	11.35	87	72713	5.924	ng	#	92
30) Ethyl Acetate	11.36	61	59483	12.339	ng		98
31) n-Hexane	11.34	57	128985	5.671	ng		100
32) Chloroform	11.39	83	113755	5.314	ng		100
34) Tetrahydrofuran (THF)	11.82	72	49480	5.498	ng		98
35) Ethyl tert-Butyl Ether	11.95	87	83941	5.751	ng		98
36) 1,2-Dichloroethane	12.20	62	82681	5.363	ng		99
38) 1,1,1-Trichloroethane	12.48	97	94587	5.238	ng		99
39) Isopropyl Acetate	12.91	61	94326	11.552	ng	#	92
40) 1-Butanol	12.93	56	84447	8.471	ng	#	71
41) Benzene	12.96	78	293783	5.084	ng		100
42) Carbon Tetrachloride	13.12	117	84392	5.077	ng		100
43) Cyclohexane	13.25	84	220018	10.725	ng		97
44) tert-Amyl Methyl Ether	13.60	73	199118	5.683	ng		99
45) 1,2-Dichloropropane	13.81	63	73916	5.449	ng		100
46) Bromodichloromethane	14.00	83	88545	5.412	ng		100
47) Trichloroethene	14.06	130	77324	5.236	ng		99
48) 1,4-Dioxane	14.03	88	58265	5.730	ng		99
49) 2,2,4-Trimethylpentane...	14.12	57	314593	5.434	ng		100
50) Methyl Methacrylate	14.26	100	59228	10.644	ng		95

Data File : I:\MS13\DATA\2020 03\12\03122002.D Vial: 15
Acq On : 12 Mar 2020 00:55 Operator: WA
Sample : CCV R13031220 5ng Inst : MS13
Misc : S31-01272001/S34-03062003 (4/4)

Quant Time: Mar 12 07:01:02 2020
Quant Method : I:\MS13\METHODS\R13031120.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Mar 12 06:29:07 2020
Response via : Initial Calibration
DataAcq Meth:TO15.M

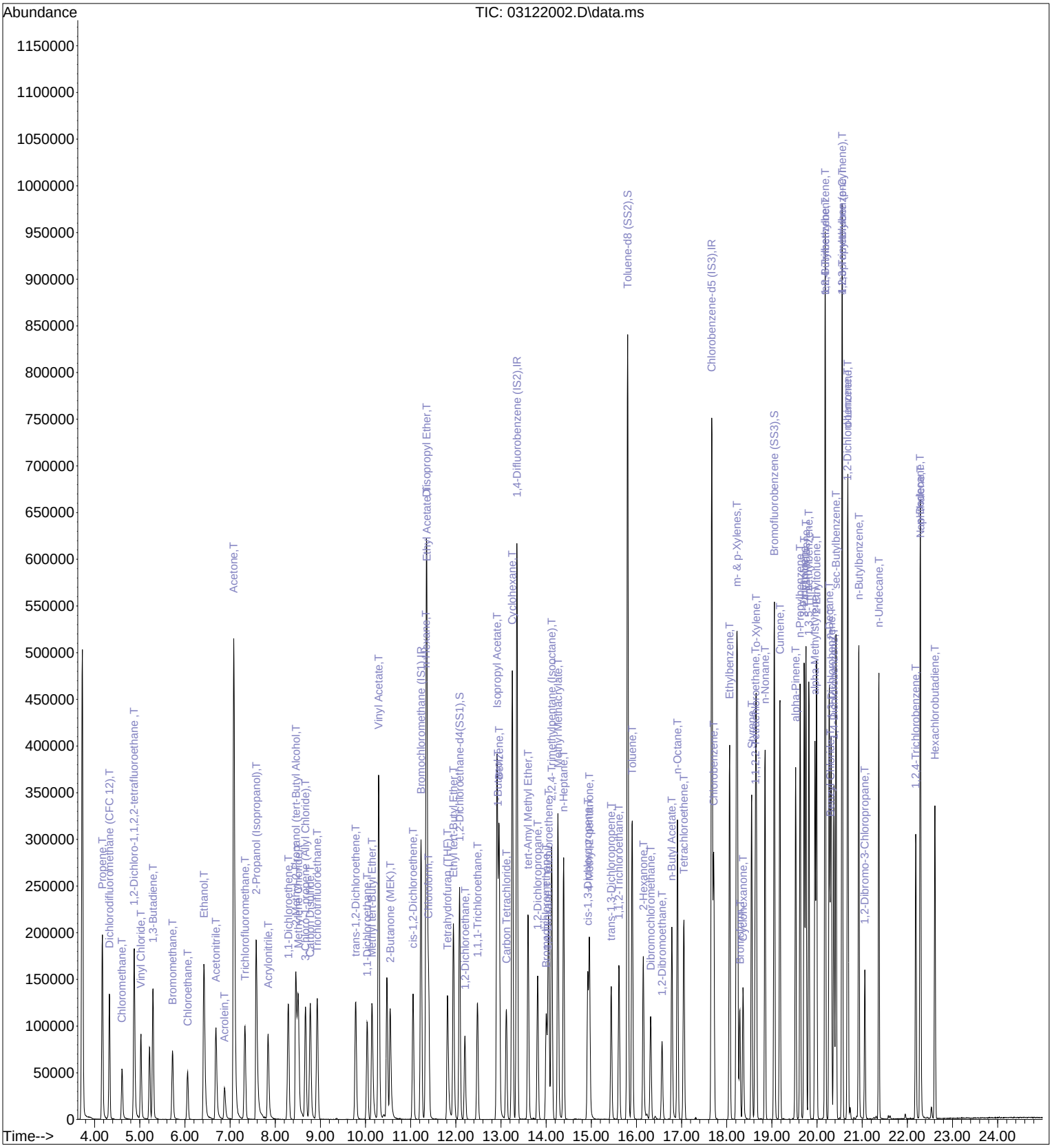
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.39	71	77670	5.588	ng	99
52) cis-1,3-Dichloropropene	14.92	75	112707	5.184	ng	100
53) 4-Methyl-2-pentanone	14.96	58	65640	5.355	ng	96
54) trans-1,3-Dichloropropene	15.44	75	98180	5.410	ng	99
55) 1,1,2-Trichloroethane	15.61	97	68650	5.431	ng	100
58) Toluene	15.91	91	295678	5.321	ng	99
59) 2-Hexanone	16.15	43	150135	5.478	ng	98
60) Dibromochloromethane	16.32	129	77176	5.405	ng	99
61) 1,2-Dibromoethane	16.57	107	75704	5.629	ng	100
62) n-Butyl Acetate	16.78	43	180102	6.183	ng	100
63) n-Octane	16.91	57	65705	5.697	ng	98
64) Tetrachloroethene	17.05	166	84024	5.083	ng	99
65) Chlorobenzene	17.71	112	195537	5.139	ng	100
66) Ethylbenzene	18.06	91	325632	5.498	ng	99
67) m- & p-Xylenes	18.22	91	498093	10.728	ng	100
68) Bromoform	18.29	173	66665	5.413	ng	100
69) Styrene	18.55	104	198003	5.626	ng	100
70) o-Xylene	18.65	91	255331	5.461	ng	99
71) n-Nonane	18.85	43	149262	5.736	ng	97
72) 1,1,2,2-Tetrachloroethane	18.63	83	118772	5.337	ng	99
74) Cumene	19.18	105	331255	5.454	ng	99
75) alpha-Pinene	19.53	93	155399	5.438	ng	96
76) n-Propylbenzene	19.62	91	393589	5.564	ng	99
77) 3-Ethyltoluene	19.71	105	339125	5.661	ng	99
78) 4-Ethyltoluene	19.75	105	299776	5.224	ng	99
79) 1,3,5-Trimethylbenzene	19.82	105	265919	5.228	ng	99
80) alpha-Methylstyrene	19.95	118	131341	5.245	ng	98
81) 2-Ethyltoluene	19.99	105	319286	5.391	ng	99
82) 1,2,4-Trimethylbenzene	20.18	105	269146	5.464	ng	99
83) n-Decane	20.27	57	155354	5.587	ng	98
84) Benzyl Chloride	20.29	91	163069	4.845	ng	99
85) 1,3-Dichlorobenzene	20.32	146	160589	5.260	ng	100
86) 1,4-Dichlorobenzene	20.37	146	161116	5.233	ng	100
87) sec-Butylbenzene	20.42	105	363722	5.405	ng	99
88) 4-Isopropyltoluene (p-...	20.56	119	341757	5.587	ng	98
89) 1,2,3-Trimethylbenzene	20.56	105	271774	5.478	ng	100
90) 1,2-Dichlorobenzene	20.68	146	153784	5.281	ng	99
91) d-Limonene	20.68	68	99099	5.593	ng	97
92) 1,2-Dibromo-3-Chloropr...	21.06	157	51107	4.923	ng	97
93) n-Undecane	21.37	57	153850	5.842	ng	99
94) 1,2,4-Trichlorobenzene	22.18	180	110550	5.483	ng	100
95) Naphthalene	22.29	128	300635	4.996	ng	99
96) n-Dodecane	22.28	57	123170	5.659	ng	98
97) Hexachlorobutadiene	22.61	225	73465	4.859	ng	100
98) Cyclohexanone	18.36	55	70352	4.328	ng	100
99) tert-Butylbenzene	20.18	119	265673	5.383	ng	99
100) n-Butylbenzene	20.93	91	282376	5.537	ng	99

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data File : I:\MS13\DATA\2020 03\12\03122002.D Vial: 15
Acq On : 12 Mar 2020 00:55 Operator: WA
Sample : CCV R13031220 5ng Inst : MS13
Misc : S31-01272001/S34-03062003 (4/4)

Quant Time: Mar 12 07:01:02 2020
Quant Method : I:\MS13\METHODS\R13031120.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Mar 12 06:29:07 2020
Response via : Initial Calibration
DataAcq Meth:TO15.M

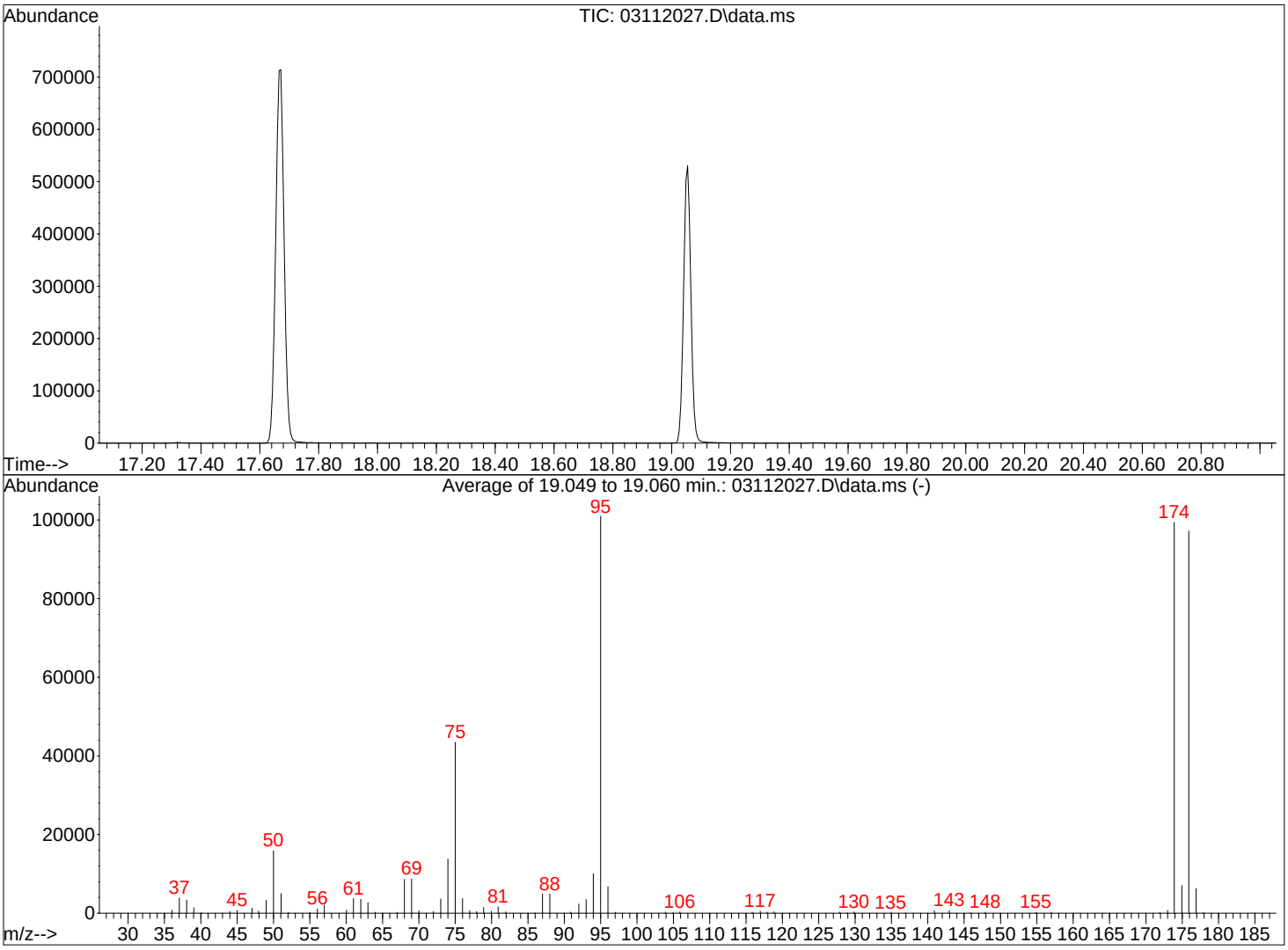


00968526

Data Path : I:\MS13\DATA\2020 03\11\
Data File : 03112027.D
Acq On : 11 Mar 2020 17:37
Operator : WA
Sample : BFB Std
Misc : S31-01272001
ALS Vial : 1 Sample Multiplier: 1

Integration File: LSCINT.P

Method : I:\MS13\METHODS\R13031120.M
Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
Last Update : Thu Mar 12 06:29:07 2020



AutoFind: Scans 2711, 2712, 2713; Background Corrected with Scan 2704

3/16/20

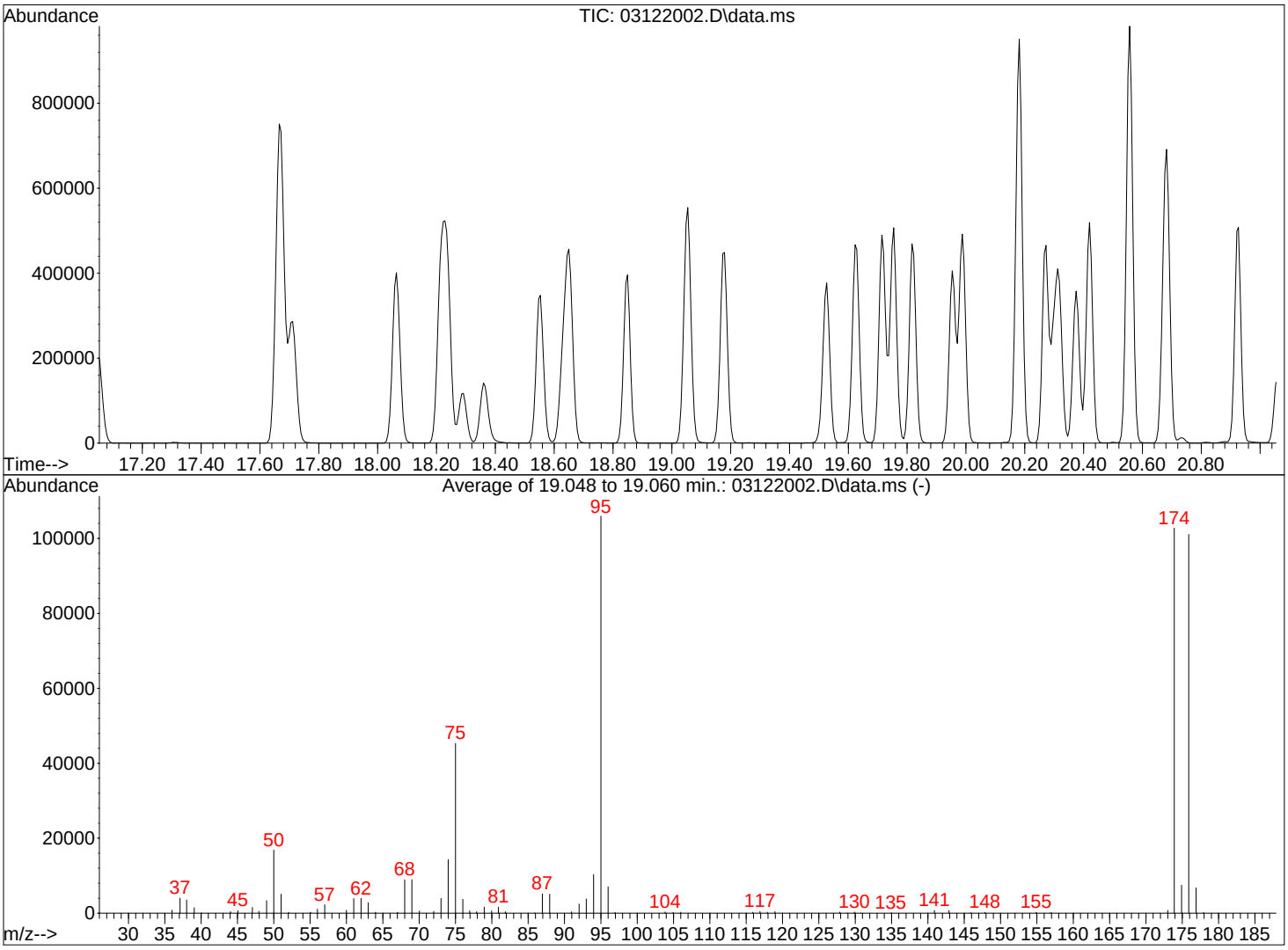
Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
50	95	8	40	15.7	15901	PASS
75	95	30	66	43.0	43443	PASS
95	95	100	100	100.0	100981	PASS
96	95	5	9	6.7	6776	PASS
173	174	0.00	2	0.7	707	PASS
174	95	50	120	98.4	99384	PASS
175	174	4	9	7.1	7007	PASS
176	174	93	101	97.8	97179	PASS
177	176	5	9	6.4	6234	PASS

00968527

Data Path : I:\MS13\DATA\2020 03\12\
Data File : 03122002.D
Acq On : 12 Mar 2020 00:55
Operator : WA
Sample : CCV R13031220 5ng
Misc : S31-01272001/S34-03062003 (4/4)
ALS Vial : 15 Sample Multiplier: 1

Integration File: LSCINT.P

Method : I:\MS13\METHODS\R13031120.M
Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
Last Update : Thu Mar 12 06:29:07 2020



AutoFind: Scans 2711, 2712, 2713; Background Corrected with Scan 2704

Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
50	95	8	40	15.9	16841	PASS
75	95	30	66	42.8	45285	PASS
95	95	100	100	100.0	105928	PASS
96	95	5	9	6.7	7064	PASS
173	174	0.00	2	0.7	753	PASS
174	95	50	120	97.0	102728	PASS
175	174	4	9	7.3	7458	PASS
176	174	93	101	98.4	101059	PASS
177	176	5	9	6.7	6749	PASS

3/12/20

Injection Log

Directory: J:\MS13\DATA\2020_03\11\

	Date/Time	File Name	Sample ID	Misc Info	Operator	Vial	Comment
27	3/11/20 17:37	03112027.D	BFB Std	S31-01272001	WA	1	*Pass*
28	3/11/20 18:10	03112028.D	0.1ng R13031120 ICAL Std	S31-01272001/S34-03102004 (4/8)	WA	14	*R13031120.M*
29	3/11/20 18:43	03112029.D	0.2ng R13031120 ICAL Std	S31-01272001/S34-03102004 (4/8)	WA	14	
30	3/11/20 19:17	03112030.D	0.5ng R13031120 ICAL Std	S31-01272001/S34-03062003 (4/4)	WA	15	
31	3/11/20 19:51	03112031.D	1.0ng R13031120 ICAL Std	S31-01272001/S34-03062003 (4/4)	WA	15	
32	3/11/20 20:25	03112032.D	5.0ng R13031120 ICAL Std	S31-01272001/S34-03062003 (4/4)	WA	15	
33	3/11/20 20:59	03112033.D	25ng R13031120 ICAL Std	S31-01272001/S34-03112002 (4/9)	WA	16	
34	3/11/20 21:33	03112034.D	50ng R13031120 ICAL Std	S31-01272001/S34-03112002 (4/9)	WA	16	
35	3/11/20 22:07	03112035.D	100ng R13031120 ICAL Std	S31-01272001/S34-03112002 (4/9)	WA	16	
36	3/11/20 22:41	03112036.D	Blank	S31-01272001	WA	1	
37	3/11/20 23:14	03112037.D	25ng R13031120 ICV Std	S31-01272001/S31-03022003 (4/1)	WA	1	*Pass all compounds*
	R13031120.M: good from 0.1ng --> 100ng, except:chloromethane & MTBE: from 0.1ng --> 50ng;chloroethane, MEK, naphthalene, cyclohexanone:						
	from 0.2ng ---> 100ng; n-Butyl acetate, Ethyl acetate, 1-Butanol: from 0.4ng --> 200ng, cis-/trans-1,3-DCP, MIBK,2-Hexanpne, 1,2-DBCP: from						
	0.5ng --> 100ng; Benzyl-Cl: from 1.0ng --> 100ng; Methyl methacrylate: from0.4ng --> 200ng; Vinyl Acetate: 1.0ng --> 500ng						

3/12/20

Injection Log

00968529

Directory: I:\MS13\DATA\2020_03\12\

	Date/Time	File Name	Sample ID	Misc Info	Operator	Vial	Comment
1	3/12/20 0:22	03122001.D	CCV C13031220_25ng	S31-01272001/S31-03032006 (4/2)	WA	3	Pass
2	3/12/20 0:55	03122002.D	CCV R13031220_5ng	S31-01272001/S34-03062003 (4/4)	WA	15	Pass
3	3/12/20 1:29	03122003.D	MB R13031220_1000mL	S31-01272001/AC01837	WA	1	Pass
4	3/12/20 2:02	03122004.D	LCS R13031220_25ng	S31-01272001/S31-03022003 (4/1)	WA	1	Pass
5	3/12/20 2:36	03122005.D	LCSD R13031220_25ng	S31-01272001/S31-03022003 (4/1)	WA	1	Pass
6	3/12/20 3:10	03122006.D	RL R13031220_0.5ng	S31-01272001/S34-03062003 (4/4)	WA	15	
7	3/12/20 3:43	03122007.D	P2001176-001 (1000mL)	S31-01272001	WA	9	
8	3/12/20 4:17	03122008.D	P2001176-002 (1000mL)	S31-01272001	WA	5	
9	3/12/20 4:50	03122009.D	P2001176-003 (1000mL)	S31-01272001	WA	6	
10	3/12/20 5:24	03122010.D	P2001176-004 (1000mL)	S31-01272001	WA	7	
11	3/12/20 5:57	03122011.D	P2001176-005 (1000mL)	S31-01272001	WA	8	
12	3/12/20 7:13	03122012.D	P2001176-005dup (1000mL)	S31-01272001	WA	8	Pass
13	3/12/20 8:05	03122013.D	P2001150-002 (10mL)	S31-01272001	WA	4	
14	3/12/20 8:38	03122014.D	P2001150-001 (1000mL)	S31-01272001	WA	5	
15	3/12/20 9:46	03122015.D	P2001150-001 (1000mL)	S31-01272001	WA	5	
16	3/12/20 10:19	03122016.D	P2001150-001dil (100mL)	S31-01272001	WA	5	
17	3/12/20 10:52	03122017.D	P2001177-001 (15mL)	S31-01272001	WA	5	
18	3/12/20 11:26	03122018.D	P2001177-002 (20mL)	S31-01272001	WA	6	
19	3/12/20 12:00	03122019.D	P2001177-003 (1000mL)	S31-01272001	WA	7	
20	3/12/20 12:33	03122020.D	P2001177-001dil (3.0mL)	S31-01272001	WA	4	
21	3/12/20 13:06	03122021.D	P2001177-004 (1000mL)	S31-01272001	WA	8	
22	3/12/20 13:39	03122022.D	P2001177-002dil (4.0mL)	S31-01272001	WA	4	
23	3/12/20 14:13	03122023.D	P2001406-001 (3.5mL)	S31-01272001	WA	4	
24	3/12/20 14:51	03122024.D	P2001171-001 (1000mL)	S31-01272001	WA	9	
25	3/12/20 15:25	03122025.D	P2001171-002 (1000mL)	S31-01272001	WA	10	
26	3/12/20 15:59	03122026.D	P2001171-003 (1000mL)	S31-01272001	WA	11	
27	3/12/20 16:32	03122027.D	P2001171-004 (1000mL)	S31-01272001	WA	12	
28	3/12/20 17:42	03122028.D	Std check	S31-01272001/S34-03112002 (4/9)	WA	16	
29	3/12/20 18:15	03122029.D	CCV2 C13031220_25ng	S31-01272001/S31-03032006 (4/2)	WA	3	
30	3/12/20 18:49	03122030.D	CCV2 R13031220_5ng	S31-01272001/S31-02272006 (3/27)	WA	1	Pass
	closing CCV2: biased high for Vinyl Acetate (ND in P2001406-001)						
	LCS/LCSD(non-DoD): Vinyl Acetate out high; 1,4-dioxane above ,w/in 130% in LCSD						
						TD 3/13/20	

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

January 20, 2020

Marcia Olive
Bhate Environmental Associates, Inc.
445 Union Blvd Ste 129
Lakewood, CO 80228

Work Order: **HS20010258**

Laboratory Results for: **Longhorn GW Treatment Plant Monthly Influent Samples**

Dear Marcia,

ALS Environmental received 1 sample(s) on Jan 08, 2020 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: 20-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Monthly Influent Samples
Work Order: HS20010258

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS20010258-01	LH18/24-SP140_010720	Water		07-Jan-2020 14:00	08-Jan-2020 08:58	☐

ALS Houston, US Date: 20-Jan-20

Client: Bhate Environmental Associates, Inc. **CASE NARRATIVE**
Project: Longhorn GW Treatment Plant Monthly Influent Samples
Work Order: HS20010258

Work Order Comments

• The analysis for Perchlorate was subcontracted to ALS Salt Lake City, UT. Final report attached.

Metals by Method SW6020

Batch ID: 149491

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

WetChemistry by Method SW7196

Batch ID: R354071

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

ALS Houston, US Date: 20-Jan-20

Client: Bhate Environmental Associates, Inc.

ANALYTICAL REPORT

Project: Longhorn GW Treatment Plant Monthly Influent Samples WorkOrder:HS20010258

Sample ID: LH18/24-SP140_010720 Lab ID:HS20010258-01

Collection Date: 07-Jan-2020 14:00 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 09-Jan-2020		Analyst: JHD
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	10-Jan-2020 10:45
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	10-Jan-2020 10:45
HEXAVALENT CHROMIUM BY SW7196A		**Method:SW7196**						Analyst: MZD
Chromium, Hexavalent	0.0100	U	0.00600	0.0100	0.0100	mg/L	1	08-Jan-2020 13:41
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	15-Jan-2020 16:41

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

ALS Houston, US

Date: 20-Jan-20

Weight / Prep Log

Client: Bhate Environmental Associates, Inc.

Project: Longhorn GW Treatment Plant Monthly Influent Samples

WorkOrder: HS20010258

Batch ID: 149491 **Start Date:** 09 Jan 2020 08:30 **End Date:** 09 Jan 2020 12:30

Method: WATER - SW3010A **Prep Code:** 3010A

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS20010258-01		10 (mL)	10 (mL)	1

ALS Houston, US Date: 20-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Monthly Influent Samples
WorkOrder: HS20010258

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: 149491 (0)	**Test Name :** METALS BY ICPMS BY SW6020A				**Matrix:** Water	
HS20010258-01	LH18/24-SP140_010720	07 Jan 2020 14:00		09 Jan 2020 12:30	10 Jan 2020 10:45	1
Batch ID: R354071 (0)	**Test Name :** HEXAVALENT CHROMIUM BY SW7196A				**Matrix:** Water	
HS20010258-01	LH18/24-SP140_010720	07 Jan 2020 14:00			08 Jan 2020 13:41	1
Batch ID: R354450 (0)	**Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)				**Matrix:** Water	
HS20010258-01	LH18/24-SP140_010720	07 Jan 2020 14:00			15 Jan 2020 16:41	1

ALS Houston, US Date: 20-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Monthly Influent Samples
WorkOrder: HS20010258

QC BATCH REPORT

Batch ID: 149491 (0) **Instrument: ICPMS04** **Method: METALS BY ICPMS BY SW6020A**

MBLK Sample ID: **MBLK-149491** Units: **mg/L** Analysis Date: **10-Jan-2020 10:41**
Client ID: Run ID: **ICPMS04_354209** SeqNo: **5431495** PrepDate: **09-Jan-2020** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Selenium	0.00250	0.00500								U
Silver	0.000500	0.00500								U

LCS Sample ID: **LCS-149491** Units: **mg/L** Analysis Date: **10-Jan-2020 10:43**
Client ID: Run ID: **ICPMS04_354209** SeqNo: **5431496** PrepDate: **09-Jan-2020** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Selenium	0.05181	0.00500	0.05	0	104	80 - 120				
Silver	0.04759	0.00500	0.05	0	95.2	85 - 116				

MS Sample ID: **HS20010259-01MS** Units: **mg/L** Analysis Date: **10-Jan-2020 10:59**
Client ID: Run ID: **ICPMS04_354209** SeqNo: **5431503** PrepDate: **09-Jan-2020** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Selenium	0.0519	0.00500	0.05	0.000048	104	80 - 120				
Silver	0.04508	0.00500	0.05	0.000021	90.1	85 - 116				

MSD Sample ID: **HS20010259-01MSD** Units: **mg/L** Analysis Date: **10-Jan-2020 10:54**
Client ID: Run ID: **ICPMS04_354209** SeqNo: **5431501** PrepDate: **09-Jan-2020** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Selenium	0.0517	0.00500	0.05	0.000048	103	80 - 120	0.05365	3.7	20	
Silver	0.04487	0.00500	0.05	0.000021	89.7	85 - 116	0.03847	15.4	20	

PDS Sample ID: **HS20010259-01PDS** Units: **mg/L** Analysis Date: **10-Jan-2020 10:56**
Client ID: Run ID: **ICPMS04_354209** SeqNo: **5431502** PrepDate: **09-Jan-2020** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Silver	0.08495	0.00500	0.1	0.000021	84.9	80 - 120				

ALS Houston, US Date: 20-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Monthly Influent Samples
WorkOrder: HS20010258

QC BATCH REPORT

Batch ID: 149491 (0) **Instrument: ICPMS04** **Method: METALS BY ICPMS BY SW6020A**

SD Sample ID: **HS20010259-01SD** Units: **mg/L** Analysis Date: **10-Jan-2020 10:50**
Client ID: Run ID: **ICPMS04_354209** SeqNo: **5431499** PrepDate: **09-Jan-2020** DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Selenium	0.0125	0.0250					0.000048	0	10	U
Silver	0.00250	0.0250					0.000021	0	10	U

The following samples were analyzed in this batch: HS20010258-01

ALS Houston, US Date: 20-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Monthly Influent Samples
WorkOrder: HS20010258

QC BATCH REPORT

Batch ID: R354071 (0) **Instrument: UV-2450** **Method: HEXAVALENT CHROMIUM BY SW7196A**

MBLK Sample ID: **MBLK-354071** Units: **mg/L** Analysis Date: **08-Jan-2020 13:41**
Client ID: Run ID: **UV-2450_354071** SeqNo: **5429217** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chromium, Hexavalent	0.0100	0.0100								U

LCS Sample ID: **LCS-354071** Units: **mg/L** Analysis Date: **08-Jan-2020 13:41**
Client ID: Run ID: **UV-2450_354071** SeqNo: **5429218** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chromium, Hexavalent	0.252	0.0100	0.25	0	101	90 - 111				

MS Sample ID: **HS20010258-01MS** Units: **mg/L** Analysis Date: **08-Jan-2020 13:41**
Client ID: **LH18/24-SP140_010720** Run ID: **UV-2450_354071** SeqNo: **5429219** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chromium, Hexavalent	0.254	0.0100	0.25	0.001	101	90 - 111				

MSD Sample ID: **HS20010258-01MSD** Units: **mg/L** Analysis Date: **08-Jan-2020 13:41**
Client ID: **LH18/24-SP140_010720** Run ID: **UV-2450_354071** SeqNo: **5429220** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chromium, Hexavalent	0.239	0.0100	0.25	0.001	95.2	90 - 111	0.254	6.09	20	

The following samples were analyzed in this batch: HS20010258-01

ALS Houston, US Date: 20-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Monthly Influent Samples
WorkOrder: **HS20010258**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

ALS Houston, US Date: 20-Jan-20

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	T104704231-19-25	30-Apr-2020

ALS Houston, US Date: 20-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Monthly Influent Samples
Work Order: HS20010258

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS20010258-01	LH18/24-SP140_010720	Login	1/8/2020 10:52:14 AM	PMG	Sub
HS20010258-01	LH18/24-SP140_010720	Login	1/8/2020 10:52:14 AM	PMG	WET116
HS20010258-01	LH18/24-SP140_010720	Login	1/8/2020 10:52:14 AM	PMG	MET081

00968542

ALS Houston, US Date: 20-Jan-20

Sample Receipt Checklist

Client Name: Bhate Environmental
Work Order: HS20010258
Date/Time Received: **08-Jan-2020 08:58**
Received by: **PMG**

Checklist completed by: *Paresh M. Giga* eSignature 8-Jan-2020 Date
Reviewed by: *RJ Modashia* eSignature 8-Jan-2020 Date

Matrices: **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):	0.6c U/C	IR25	
Cooler(s)/Kit(s):	42584		
Date/Time sample(s) sent to storage:	1/8/2020 11:00		
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:

00968543

CHAIN OF CUSTODY

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

Page 1 of 1

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

Project No. NWO1312.0150.0 16.0001

Job:
GROUNDWATER TREATMENT PLANT MONTHLY INFLUENT SAMPLES

Prepared By: Scott Beesinger

P.O. Number

HS20010258
Bhate Environmental Associates, Inc.
Longhorn GW Treatment Plant Monthly Influent Sample

Field Sample I.D.	Sample Matrix	Date / Time	MS / MSD	No. OF CONTAINERS	SILVER & SELENIUM	HEXAVALENT CHROMIUM	PERCHLORATE								Remarks (Preservatives, etc.)	Lab I.D.#
LH18/24-SP140_010720	Water	01/07/20 / 14:00		1	X										HNO3	
LH18/24-SP140_010720	Water	01/07/20 / 14:00		2		X	X								NONE	

Additional Remarks: **STANDARD TURN AROUND TIME**

Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
Scott Beesinger	01/07/20	14:30	[signature]	1/8/20	08:58						

For Lab Use Only

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

Remarks:

42584 VIC. 0.60 #25 CIF 0.0"

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

00968544

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

Date: 1/
Name: S
Company:

CUSTODY SEAL
7/20 Time: 1430
Scott Beesinger
BHATE

Seal Broken By:
Date: 1/8/20

Must Deliver Next Business Day
Time and Tempature Sensitive!

ALS

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
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) 530-5656
REF: LHAAP-18/24-BO 68900-RJ

RMA:

FedEx Express

E

RETURNS MON-SAT
WED - 08 JAN 10:30A
PRIORITY OVERNIGHT

FedEx
TRK# 0221 1251 0292 4130

AB SGRA

77099
TX-US
IAH

FID 162785 07JAN20 GGGA 56AC2/DF82/05A2

Part # 159469-434 RIT EXP 07/20



Case Narrative

Method: 6850
Analysis: Perchlorate
Analysis SOP: LC-MS-CLO4
ALS WO ID(s): 2000307; 2000949; 2000952; 2000953

Client: ALS Laboratories (Houston, TX)
Matrix: Water
ELMS Batch (HBN): 2340 (255305)

General Set Information: There were four 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. 50µL 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 0.45µm Syringe filters.

Holding Times: Holding times were met for all analyses.

Dilutions: Field sample 2000952001 was analyzed and reported from a 1:1,000 dilution. The reporting limit has been adjusted accordingly.

Method QC data: The method blank (LMB 691930) was less than 1/2 the CRDL. The recovery for the LCS (692062) was within acceptable parameters.

MS/MSD Analysis: MS/MSD was performed on sample 2000307001 (Client ID: LH24-SP650_1230.19_BIX). 3.0µL of Working Standard Solution Horizon ID 49947 was added to 10.0mL of sample preparation. The spike target was 3.µg/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 µg/L. Results were calculated in µg/L by the equation (A)x(B),

where: A = Analyte concentration from the standard curve (µg/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 – 691929) is reported from the analysis of the Laboratory Control Sample (LCS – 692062) at a level of 3.0µg/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 15, 2020
Analyst Date

ANALYTICAL REPORT

Report Date: January 15, 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: **34-2000952**
Project ID: HS20010258-1
Purchase Order: HS20010258-1
Project Manager Kevin W. Griffiths

Client Sample ID	Lab ID	Collect Date	Receive Date	Sampling Site
LH18/24-SP140_010720	2000952001	01/07/20	01/09/20	HS20010258-1

ANALYTICAL REPORT

Workorder: 34-2000952
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: **LH18/24-SP140_010720** | Sampling Site: HS20010258-1 | Collected: 01/07/2020
Lab ID: 2000952001 | Media: 125 mL Nalgene | Received: 01/09/2020
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2340 (HBN: 255305) | **%Solids:** NA
Analyzed: 01/15/2020 11:04 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	**13000**	1000	2000	4000	1000	

Comments

Quality Control: **EPA 6850, DoD QSM - (HBN: 255305)**

Field sample 2000952001 was analyzed and reported from a 1:1,000 dilution. The reporting limit has 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 01/15/2020 13:34	/S/ Stephen Brose 01/15/2020 14:31

Laboratory Contact Information

ALS Environmental
960 W Levoy Drive
Salt Lake City, Utah 84123

Phone: (801) 266-7700
Email: alslt.lab@ALSGlobal.com
Web: www.alsslc.com

ANALYTICAL REPORT

Workorder: 34-2000952
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

Analysis Information

Workorder: 2000952

Limits:	Client SOW/Contract Specified	**Preparation:**	NA	**Analysis:**	EPA 6850, DoD QSM
Basis:	DoD QSM	**Batch:**	NA	**Batch:**	ELMS/2340 (HBN: 255305)
		Prepared By:	NA	**Analyzed By:**	Thomas Bosch

Blank

LMB: 691930
Analyzed: 01/15/2020 09:54
Units: ug/L

Analyte	Result	MDL	RL
Perchlorate	ND	1	2.00

Laboratory Control Sample

LCS: 692062
Analyzed: 01/15/2020 09:26
Dilution: 1
Units: ug/L

Analyte	Result	Target	% Rec	QC Limits	
Perchlorate	3.29	3.00	110	78.8	123.8

Matrix Spike - Matrix Spike Duplicate

Sample:	2000307001	**MS:**	691932	**MSD:**	691933
Analyzed:	01/15/2020 10:08	**Analyzed:**	01/15/2020 10:22	**Analyzed:**	01/15/2020 10:36
Dilution:	1	**Dilution:**	1	**Dilution:**	1
Units:	ug/L	**Units:**	ug/L	**Units:**	ug/L

Analyte	Result	Result	Target	% Rec	QC Limits		Result	% Rec	RPD	QC Limits	
Perchlorate	ND	3.2	3	107	78.8	123.8	3.46	115	7.86	0.0	20.0

Comments

Field sample 2000952001 was analyzed and reported from a 1:1,000 dilution. The reporting limit has been adjusted accordingly.

QC Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Analyst	Peer Review
/S/ Thomas Bosch	/S/ Stephen Brose
01/15/2020 13:39	01/15/2020 14:31

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

2000952

W 2000952

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: **Dept of Defense** **COC ID:** **13050**

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:	
Email:	

INVOICE INFORMATION:

Company:	ALS Houston
Contact:	Accounts Payable
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Reference:	HS20010258
TSR:	Danielle Winnings

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS20010258-01**	**LH18/24-SP140_010720**	**Water**	**07 Jan 2020 14:00**
	SUB_Perch-6850			16 Jan 2020

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. Mynatt Date/Time: 01/08/20 18:00

Received By: [signature] Date/Time: 1/9/20 09:28

Cooler ID(s): Temperature(s):

00968552

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: 1/9/20 09:28

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		
	(Frozen)/Melted/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	Great	4 °C	4		°C	7		°C
2		°C	5		°C	8		°C
3		°C	6		°C	9		°C

Taken By: Jaylynn B- (Signature) Jaylynn Brittain (Printed Name) 1/9/20 (Date)

CLIENT-RELATED INFORMATION

☐ Missing Cooler	☐ Missing Samples/Bottles	☐ Incorrect Preservation	☐ Insufficient Sample Volume
☐ Cooler Conditions	☐ Broken/Leaking Samples	☐ pH Criteria Not Met	☐ Chain of Custody Problems
☐ Missing Paperwork	☐ Incorrect Bottle Type	☐ Residual Chlorine Present	☐ Other:
☐ Missing/Incorrect Bottle Labels	☐ Cooler Temperatures Out of Range	☐ 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: _____ (Printed Name) Returned to Sample Receipt by: _____ (Signature) Date: _____

00968553



ORIGIN ID:SGRA (281) 530-5656
SHIPPING DEPT
ALS LABORATORY GROUP
10450 STANCLIFF RD
SUITE 210
HOUSTON, TX 77099
UNITED STATES US

SHIP DATE: 08JAN20
ACTWGT: 9.85 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) 266-7700
REF: HS20010258/259/261 RJ

FedEx Express

THU - 09 JAN 3:00P
STANDARD OVERNIGHT

TRK# 0201 **1251 0293 5192**

AX BTFA

84123
UT-US **SLC**

ALS Environmental
CHAIN-OF-CUSTODY

Project / Job / Task: HS20010258-1	***Split:***	**Workorder ID:** 2000952	**Level:** ENV_LVL4	**Requested Analysis**
Client: ALS Environmental (Houston)		**Account:** 8101	**Type:** 125Poly	
Comments:			**Preservatives**	

Item	Collect Date/Time	Sample ID	Lab ID	QC	Matrix	Containers ID(s)	Containers Count	EPA 6850, DoD QSM
1	01/07/2020 14:00	LH18/24-SP140_010720	2000952001		Soil/Solid/Sediment	A	1	A

COOL

ORIGINAL FIELD SAMPLE CHAIN-OF-CUSTODY

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location
VanTassell, Tami	01/09/2020 09:28	ALS Sample Receiving	Sample Login
Tami VanTassell R-33-1	01-09-20 17:20	ISB	Storage
	01-13-20/08:35	T. Burch	CLP analysis

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

00968554

Batch Worklist

Batch: ELMS/ 2340
Rule: EPA 6850, DoD QSM Water

Created: 1/14/2020 15:38
Analyst: T. Bosch

Instrument: LCMS04
Status: WP

HBN: 255305

Workorder: 2000307 [ENV_LVL4]
Workorder: 2000949 [ENV_LVL4]
Workorder: 2000952 [ENV_LVL4]
Workorder: 2000953 [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	691928	CCV for HBN 255305 [ELMS/2340]				CCV	3		E685041C3Q	5311		1/16/2020	1/15/2020
2	691929	RLVS for HBN 255305 [ELMS/2340				RLVS	3		E685041C3Q	5311		1/16/2020	1/15/2020
3	692062	LCS for HBN 255305 [ELMS/2340]				LCS	3		E6850Q413Q	5311		1/16/2020	
4	691973	ICS for HBN 255305 [ELMS/2340]				ICS	3		E6850..D3Q	5311		1/16/2020	1/15/2020
5	691930	LMB for HBN 255305 [ELMS/2340]				LMB	3		E6850Q413Q	5311		1/16/2020	1/15/2020
6	2000307001	LH18/24-SP650_1230.19_BIX				SAMPLE	3	2000307001-A	E6850Q41.3	5480	1/27/2020	1/16/2020	1/15/2020
7	691932	LH18/24-SP650...(2000307001MS)				MS	3		E6850Q413Q	5311		1/16/2020	1/15/2020
8	691933	LH18/24-SP65...(2000307001MSD)				MSD	3		E6850Q413Q	5311		1/16/2020	1/15/2020
9	2000949001	LH18/24-SP650_010720_BIX Water				SAMPLE	3	2000949001-A	E6850Q41.3	5480	2/4/2020	1/22/2020	1/15/2020
10	2000952001	LH18/24-SP140_010720				SAMPLE	3	2000952001-A	E6850Q41.3	5480	2/4/2020	1/23/2020	1/15/2020
11	2000953001	LH18/24-SP650_010720_BIX Water				SAMPLE	3	2000953001-A	E6850Q41.3	5480	2/4/2020	1/22/2020	1/15/2020
12	691934	CCV for HBN 255305 [ELMS/2340]				CCV	3		E685041C3Q	5311		1/16/2020	1/15/2020

00968555



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Analytical Documentation

Analyst Write-up

ALS Work Order #'s & Sample #( )'s: 2000307 (001); 2000949 (001); 2000952 (001); 2000953 (001)
ELMS Batch/HBN ID: 2336 (254688)
Prep Date: 01/13/2020 Analysis Date: 01/15/2020 Analyst: Tom Bosch
Analyte: **Perchlorate** Matrix: **Water** Method: **6850**
Sequence: \\HPCHEM\1\SEQUENCE\CLO4\2020\JAN\15JAN20D.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 692092; Target = 3.0µg/L. ASTM type II water was used for LMB 691930.

MS/MSD: The Matrix Spike and duplicate (MS/MSD) was performed on sample 2000307001 (Client ID: LH24-SP650_1230.19_BIX). 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 2000952001 was analyzed and reported from a 1:1,000 dilution. The reporting limit has 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\2020\JAN\HBN# or through NuGenesis\Tree\PrintData\LCMS\DefaultView.
4) Notebook: \\alsltws013\ORGANIC\BOSCH\LCMS\Perchlorates\Waters\2020\DOD\255305-DoD-ALS-Hstn LCMS4 or through \\ALSLTWS013\DATAREVIEW\HBN#
5) The Reporting Limit Verification Standard (RLVS – 691929) is reported from the analysis of the Laboratory Control Sample (LCS – 692062) 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 **Batch(es)/SDG:** ELMS: 2340 HBN: 255305 **Sample Set IDs if Applicable:** 2000307/2000949/2000952/2000953	**Analyst Initials**	**Reviewer Initials**
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
MFG: ALS/SLC
MFG Lot: TNB: 09/20/2019
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 09/23/2019 03:09PM

Amount: 10 mL
Expires: 07/25/2020
Usable: Yes
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

S 43659

AccuTrace™ Reference Standard

Catalog No: IC-PER-10X-1
Description: Perchlorate Standard
Element: Perchlorate (ClO_4)
SRM: Ind. Std.
Lot: 218065075
Matrix: Water
Hazards: *Refer to SDS for complete safety information*

Signal Word: None

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

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

For use in routine laboratory analysis.

AccuStandard is accredited to ISO 17034, ISO/IEC 17025 and certified to ISO 9001:2015

AccuStandard

ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

TRIPLE ISO CERTIFICATION ISO 9001 ISO GUIDE 34 ISO 17025 ULTRA

ISO Guide 34 Reference Material

Product Number: ICC-013
Lot Number: CP-0860

S 36748

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.

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

ANAB ACCREDITED ISO/IEC 17025 TESTING LABORATORY

ISO 9001 Registered Quality System – TUV USA

ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

TRIPLE ISO CERTIFICATION ULTRA ISO 9001:2008 ISO GUIDE 34:2009 ISO 17025

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

ANAB ACCREDITED ACCREDITATION REFERENCE MATERIAL PRODUCER

ANAB ACCREDITED ACCREDITATION TESTING LABORATORY

Cambridge Isotope Laboratories, Inc.

Certificate of Analysis

S 47863

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:	≥ 98%
MW*: * For isotopically labeled compounds, MW listed is for the fully enriched product.	130.44
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.

$NaCl^{18}O_4$

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 ± 1.0 µg/mL (k=2)
Chemical Purity of Neat Material(s)	98%
LC/MS for Concentration	105.4 ± 1.1 µg/mL (k=2)



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

00968574

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
	*	691928 CCV@25	Vial 71	1	Control	1	1.72889e6	7.434	23.42373
	*	691929 RLVS@3.	Vial 72	1	Control	2	2.18673e5	7.137	3.28544
	*	691973 ICS@3.0	Vial 73	1	Control	3	1.35107e5	7.223	2.74699
	*	691930 LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
	*	2000307001	Vial 75	1	Sample	5	0.00000	0.000	0.00000
	*	691932 03071MS	Vial 76	1	Sample	6	2.05477e5	7.225	3.19824
	*	691933 03071SD	Vial 77	1	Sample	7	2.03421e5	7.166	3.45981
	*	2000949001	Vial 78	1	Sample	8	1.28802e5	7.167	1.95055
	*	2000952001 1K	Vial 79	1	Sample	9	9.69192e5	7.467	1.33675e4
	*	2000953001	Vial 80	1	Sample	10	1.27924e5	7.209	1.98446
	*	691934 CCV@25	Vial 71	1	Control	11	1.75169e6	7.513	23.40547

#	*	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
	*	691928 CCV@25	Vial 71	1	Control	1	2.53846e5	7.458	5.00000
	*	691929 RLVS@3.	Vial 72	1	Control	2	2.45151e5	7.155	5.00000
	*	691973 ICS@3.0	Vial 73	1	Control	3	1.80729e5	7.237	5.00000
	*	691930 LMB	Vial 74	1	Control	4	2.29509e5	7.359	5.00000
	*	2000307001	Vial 75	1	Sample	5	2.52311e5	7.208	5.00000
	*	691932 03071MS	Vial 76	1	Sample	6	2.36573e5	7.234	5.00000
	*	691933 03071SD	Vial 77	1	Sample	7	2.16655e5	7.188	5.00000
	*	2000949001	Vial 78	1	Sample	8	2.40635e5	7.188	5.00000
	*	2000952001 1K	Vial 79	1	Sample	9	2.59889e5	7.488	5000.00000
	*	2000953001	Vial 80	1	Sample	10	2.35040e5	7.233	5.00000
	*	691934 CCV@25	Vial 71	1	Control	11	2.57415e5	7.543	5.00000

#	*	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
	*	691928 CCV@25	Vial 71	1	Control	1	5.16114e5	7.454	22.95643
	*	691929 RLVS@3.	Vial 72	1	Control	2	7.08840e4	7.153	3.40228
	*	691973 ICS@3.0	Vial 73	1	Control	3	4.90107e4	7.237	3.18375
	*	691930 LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
	*	2000307001	Vial 75	1	Sample	5	0.00000	0.000	0.00000
	*	691932 03071MS	Vial 76	1	Sample	6	7.10460e4	7.230	3.53797
	*	691933 03071SD	Vial 77	1	Sample	7	7.17154e4	7.182	3.91012
	*	2000949001	Vial 78	1	Sample	8	4.39331e4	7.199	2.09952
	*	2000952001 1K	Vial 79	1	Sample	9	2.85347e5	7.486	1.28498e4
	*	2000953001	Vial 80	1	Sample	10	4.63748e4	7.229	2.28052
	*	691934 CCV@25	Vial 71	1	Control	11	5.25077e5	7.533	23.02547

*** End of Report ***

Sequence Table:

Method and Injection Info Part:

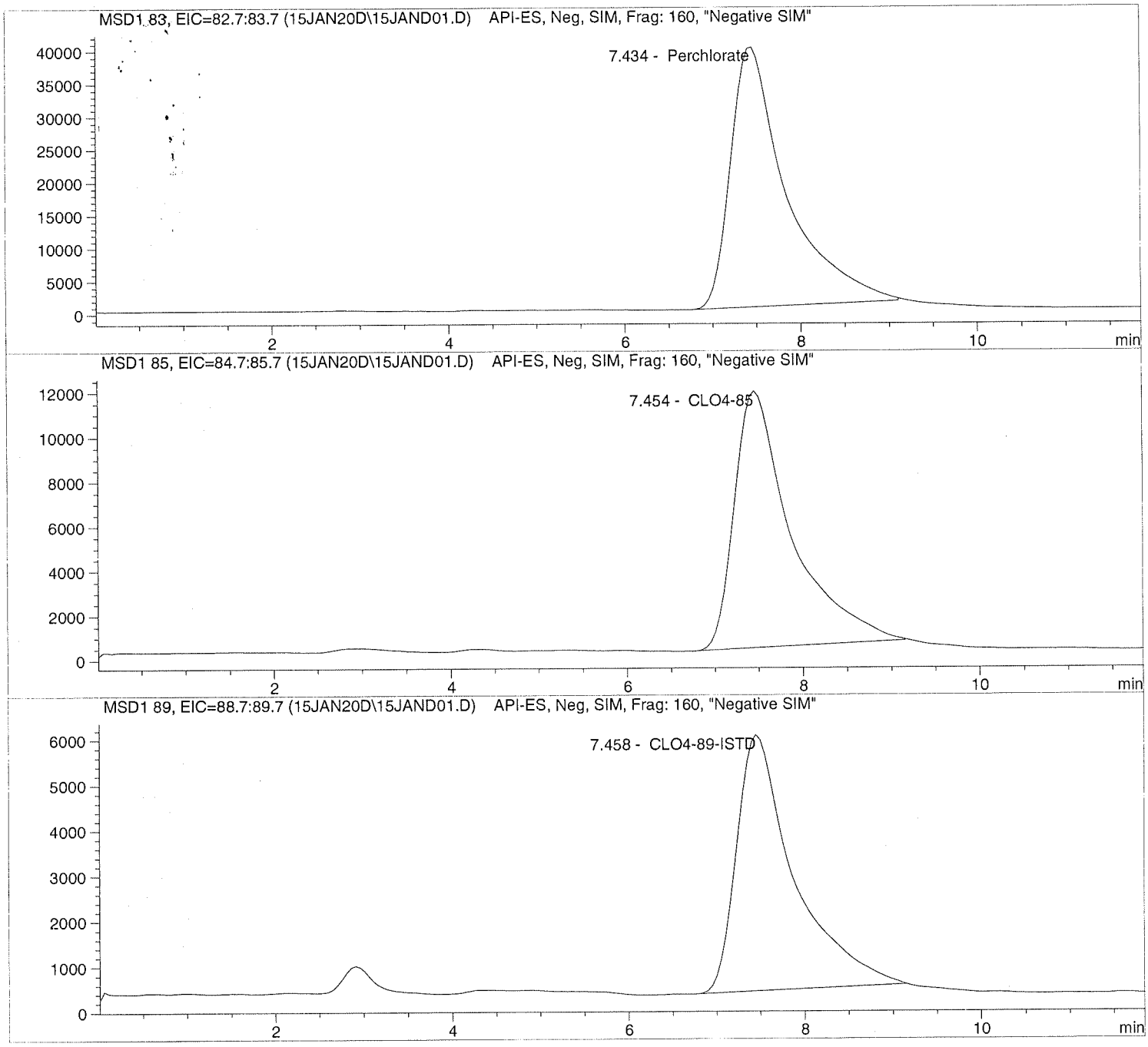
Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
1	Vial 71	691928 CCV@25	CLO4-AQN	1	Ctrl Samp		
2	Vial 72	691929 RLVS@3.	CLO4-AQN	1	Ctrl Samp		
3	Vial 73	691973 ICS@3.0	CLO4-AQN	1	Ctrl Samp		
4	Vial 74	691930 LMB	CLO4-AQN	1	Ctrl Samp		
5	Vial 75	2000307001	CLO4-AQN	1	Sample		
6	Vial 76	691932 03071MS	CLO4-AQN	1	Sample		
7	Vial 77	691933 03071SD	CLO4-AQN	1	Sample		
8	Vial 78	2000949001	CLO4-AQN	1	Sample		
9	Vial 79	2000952001 1K	CLO4-AQN	1	Sample		
10	Vial 80	2000953001	CLO4-AQN	1	Sample		
11	Vial 71	691934 CCV@25	CLO4-AQN	1	Ctrl Samp		

Data file: C:\HPCHEM\1\DATA\15JAN20D\15JAND01.D Sample Name: 691928 CCV@25

Injection Date:	1/15/2020 09:13:04	Seq Line:	1
Sample Name:	691928 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\15JAN20D\15JAND01.D Sample Name: 691928 CCV@25

Injection Date:	1/15/2020 09:13:04	Seq Line:	1
Sample Name:	691928 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
7.434	PBA	1728889.5	23.4237	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.454	PBA	516113.6	22.9564	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.458	PBA	253846.5	5.0000	CLO4-89-ISTD

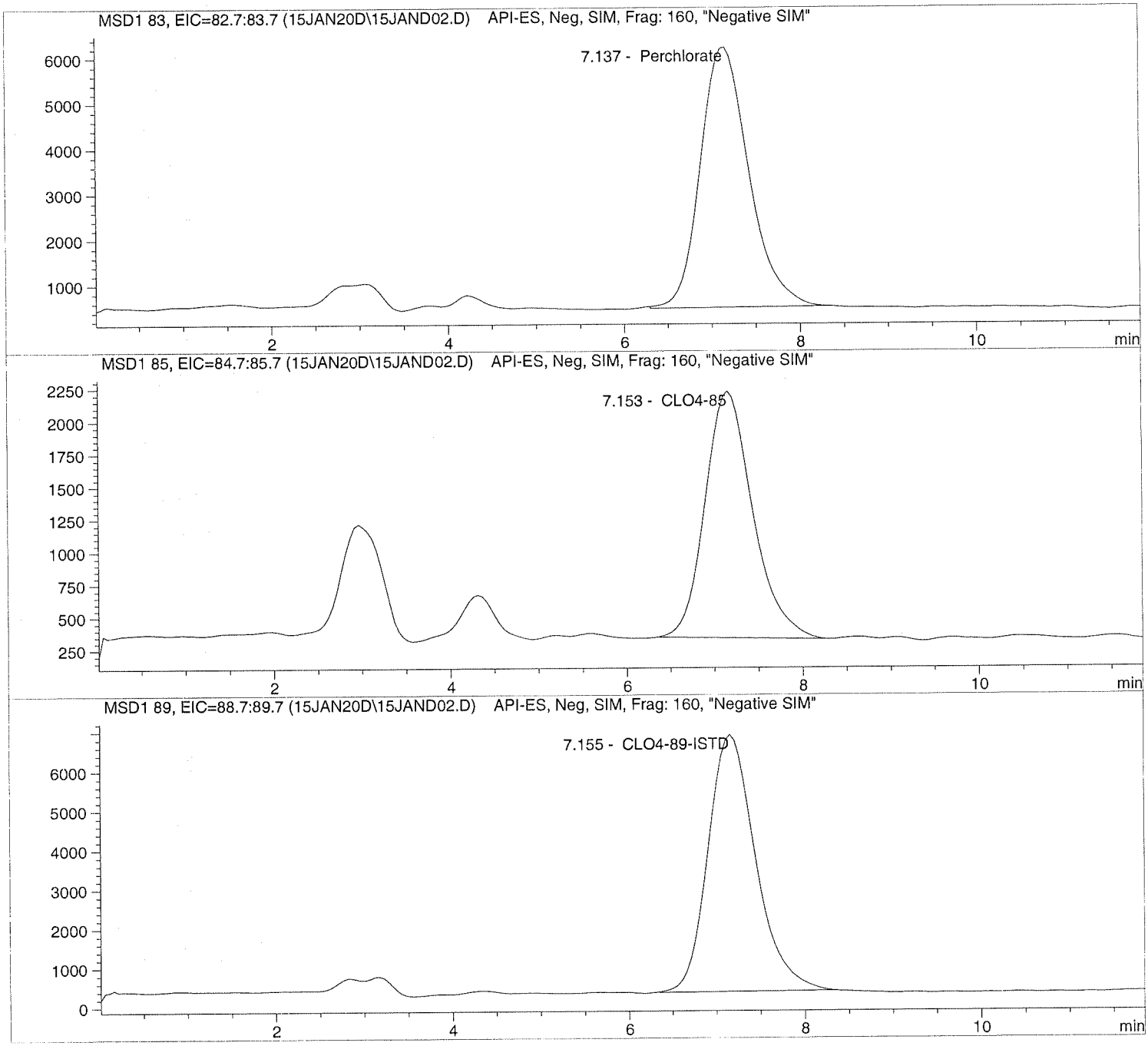
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\15JAN20D\15JAND02.D Sample Name: 691929 RLVS@3.

Injection Date:	1/15/2020 09:26:54	Seq Line:	2
Sample Name:	691929 RLVS@3.	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\15JAN20D\15JAND02.D Sample Name: 691929 RLVS@3.

Injection Date:	1/15/2020 09:26:54	Seq Line:	2
Sample Name:	691929 RLVS@3.	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
7.137	BBA	218673.2	3.2854	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.153	BBA	70884.0	3.4023	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.155	PBA	245151.2	5.0000	CLO4-89-ISTD

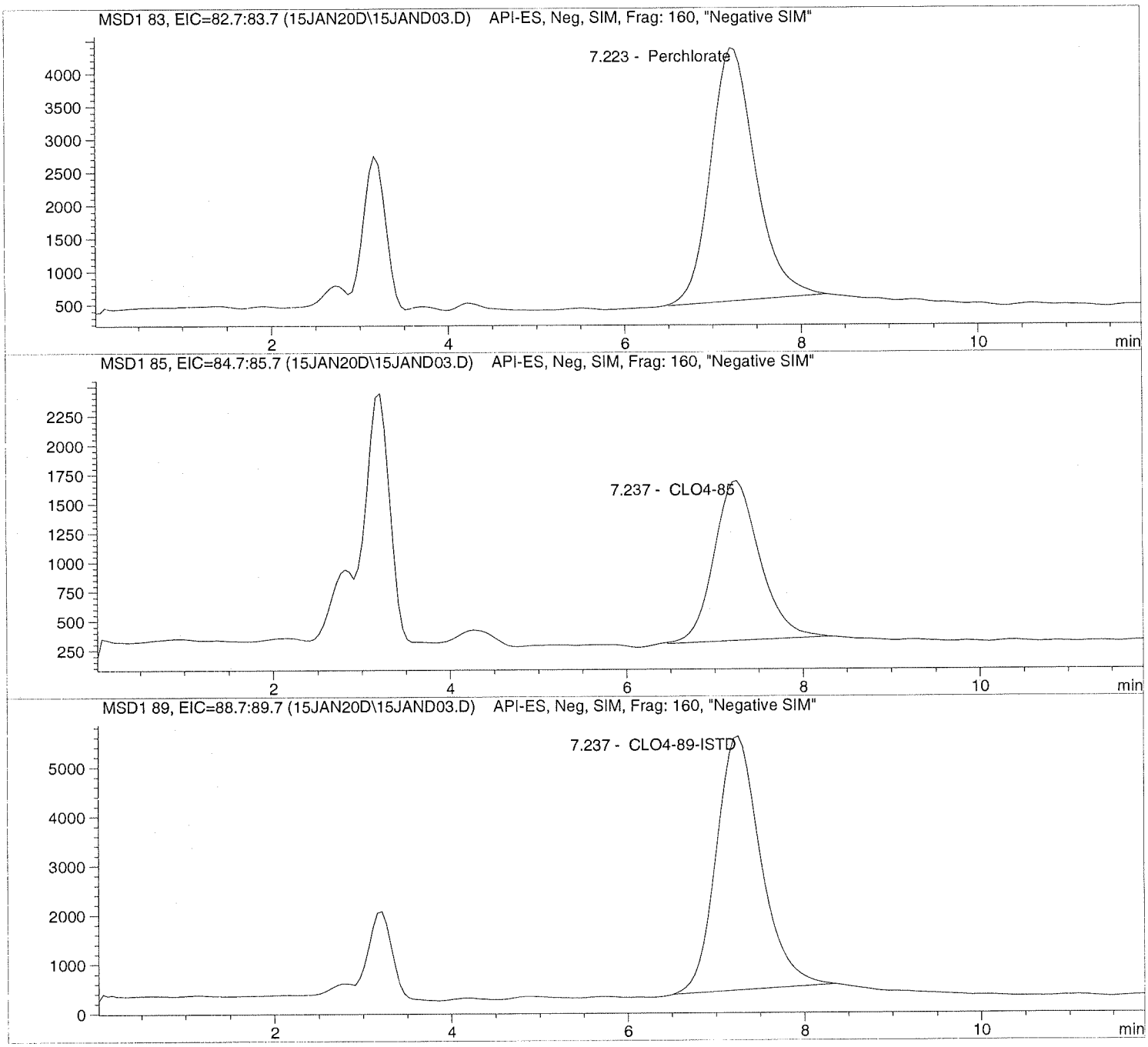
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\15JAN20D\15JAND03.D Sample Name: 691973 ICS@3.0

Injection Date:	1/15/2020 09:40:49	Seq Line:	3
Sample Name:	691973 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\15JAN20D\15JAND03.D Sample Name: 691973 ICS@3.0

Injection Date:	1/15/2020 09:40:49	Seq Line:	3
Sample Name:	691973 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
7.223	PBA	135106.7	2.7470	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.237	BBA	49010.7	3.1837	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.237	PBA	180729.3	5.0000	CLO4-89-ISTD

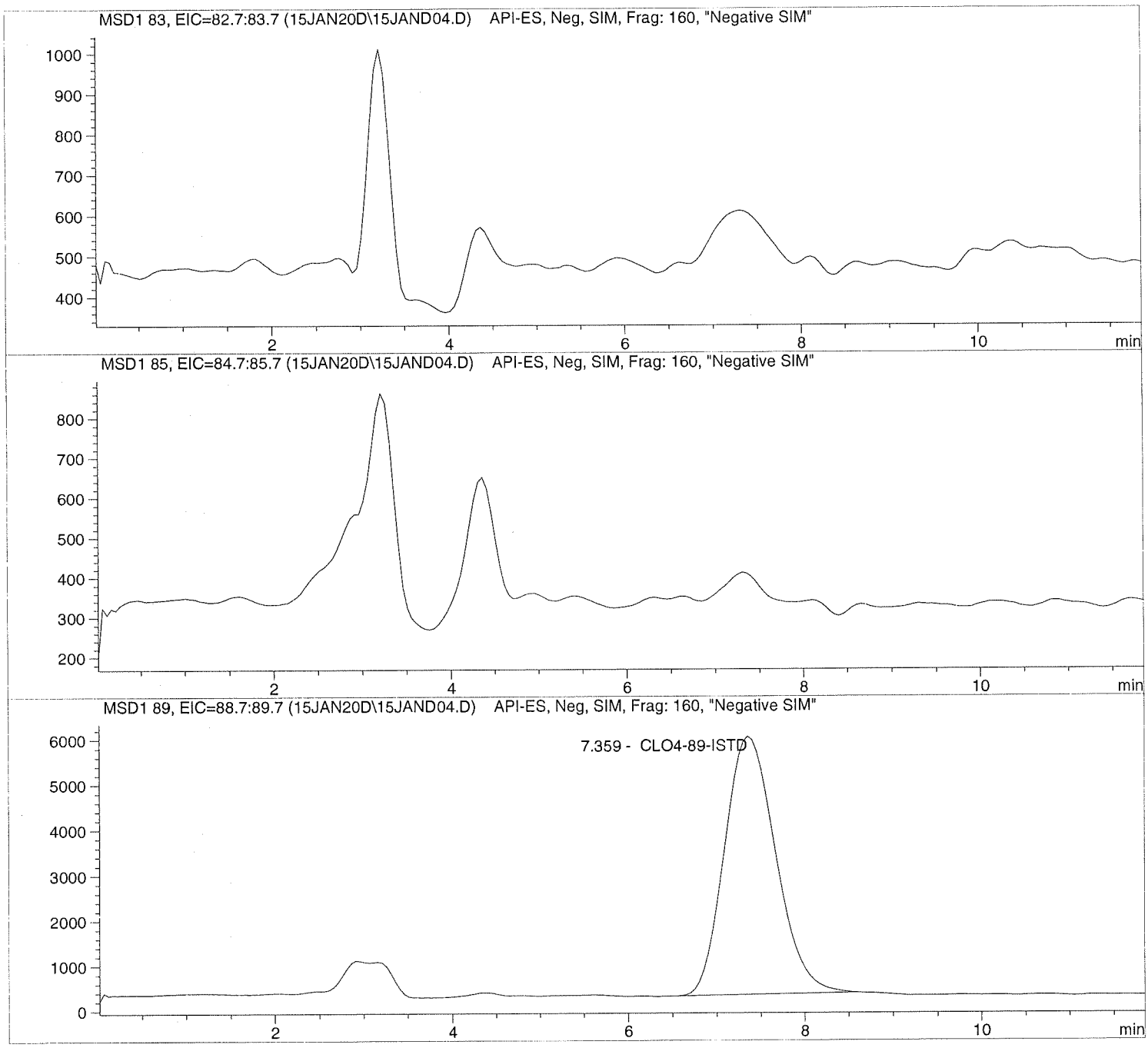
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\15JAN20D\15JAND04.D Sample Name: 691930 LMB

Injection Date:	1/15/2020 09:54:46	Seq Line:	4
Sample Name:	691930 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\15JAN20D\15JAND04.D Sample Name: 691930 LMB

Injection Date:	1/15/2020 09:54:46	Seq Line:	4
Sample Name:	691930 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
7.359	PBA	229508.7	5.0000	CLO4-89-ISTD

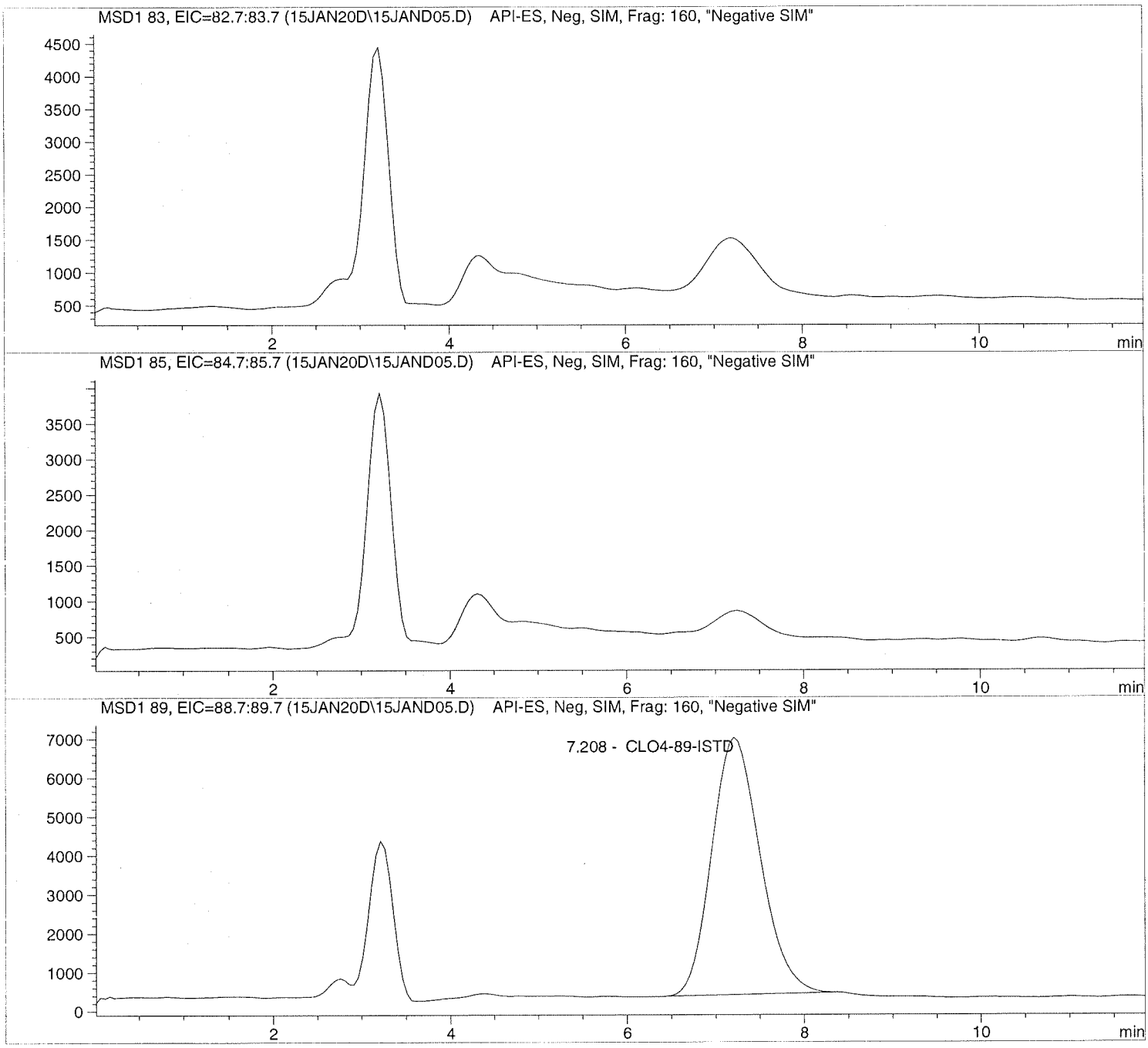
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\15JAN20D\15JAND05.D Sample Name: 2000307001

Injection Date:	1/15/2020 10:08:38	Seq Line:	5
Sample Name:	2000307001	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\15JAN20D\15JAND05.D Sample Name: 2000307001

Injection Date:	1/15/2020 10:08:38	Seq Line:	5
Sample Name:	2000307001	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
7.208	PBA	252311.3	5.0000	CLO4-89-ISTD

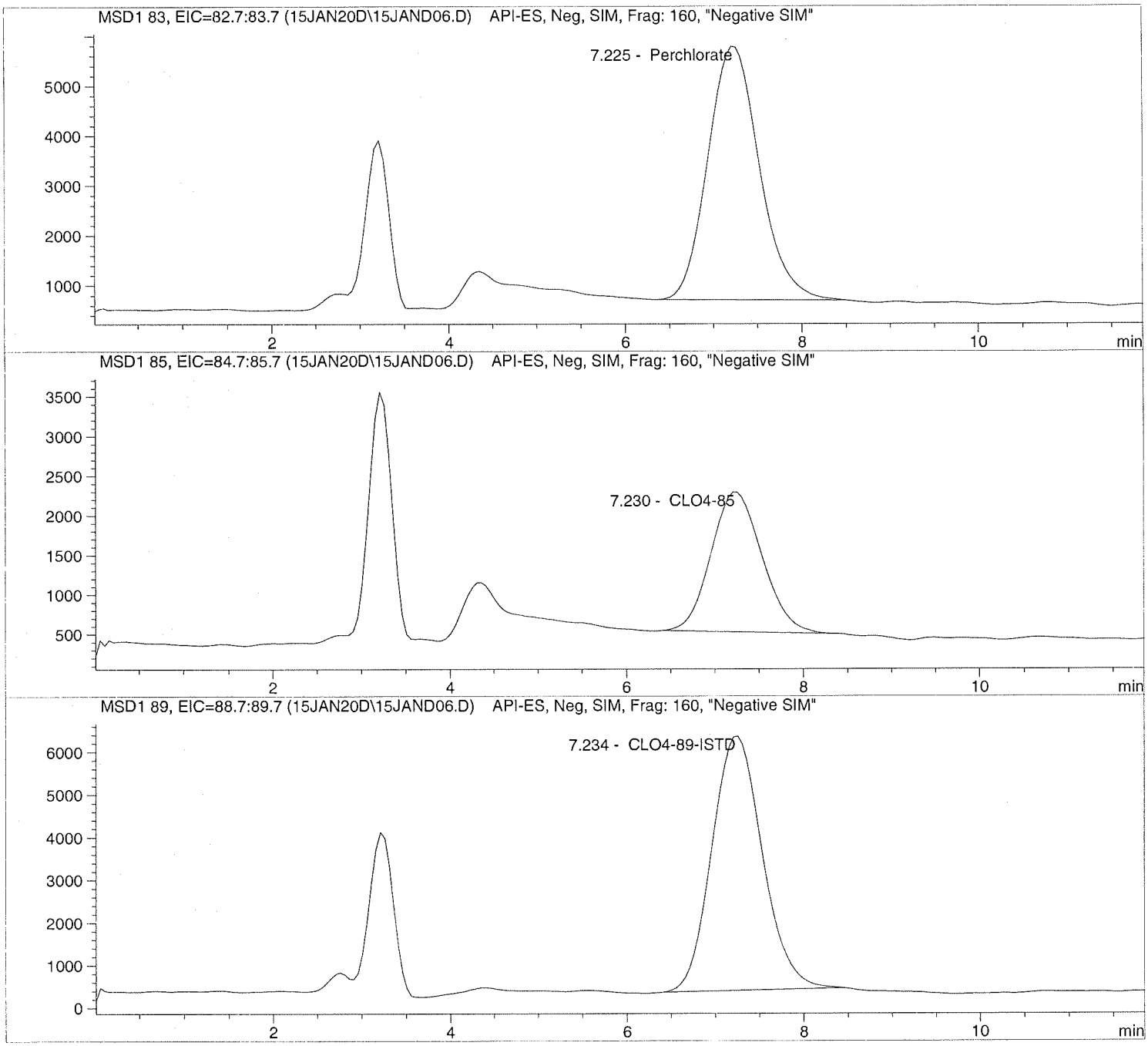
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\15JAN20D\15JAND06.D Sample Name: 691932 03071MS

Injection Date:	1/15/2020 10:22:29	Seq Line:	6
Sample Name:	691932 03071MS	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\15JAN20D\15JAND06.D Sample Name: 691932 03071MS

Injection Date:	1/15/2020 10:22:29	Seq Line:	6
Sample Name:	691932 03071MS	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
7.225	PBA	205477.1	3.1982	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.230	PBA	71046.0	3.5380	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.234	PBA	236573.4	5.0000	CLO4-89-ISTD

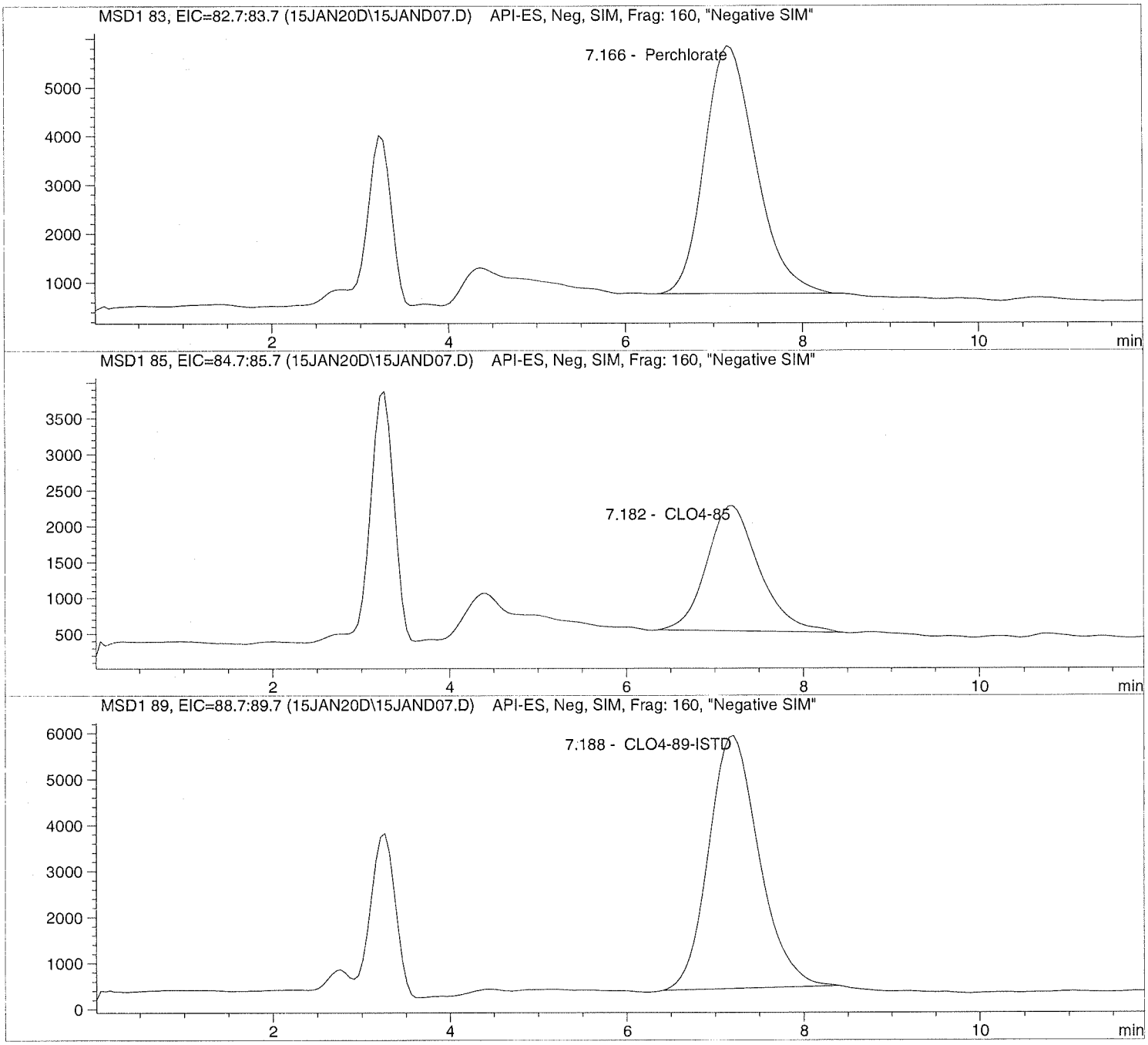
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\15JAN20D\15JAND07.D Sample Name: 691933 03071SD

Injection Date:	1/15/2020 10:36:32	Seq Line:	7
Sample Name:	691933 03071SD	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\15JAN20D\15JAND07.D Sample Name: 691933 03071SD

Injection Date:	1/15/2020 10:36:32	Seq Line:	7
Sample Name:	691933 03071SD	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
7.166	PBA	203421.1	3.4598	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.182	PBA	71715.4	3.9101	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.188	PBA	216654.6	5.0000	CLO4-89-ISTD

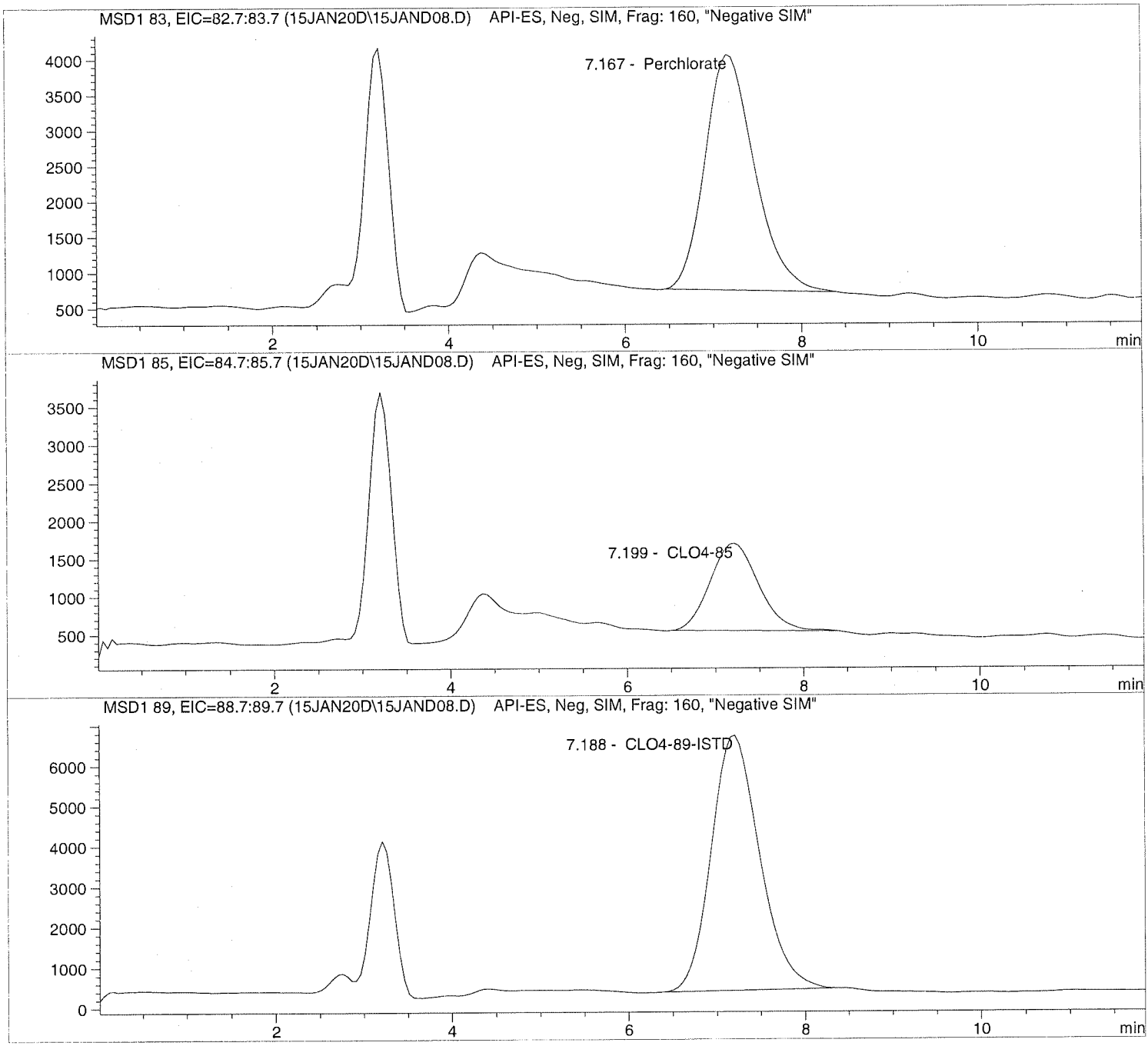
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\15JAN20D\15JAND08.D Sample Name: 2000949001

Injection Date:	1/15/2020 10:50:37	Seq Line:	8
Sample Name:	2000949001	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



Data file: C:\HPCHEM\1\DATA\15JAN20D\15JAND08.D Sample Name: 2000949001

Injection Date:	1/15/2020 10:50:37	Seq Line:	8
Sample Name:	2000949001	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
7.167	PBA	128801.7	1.9506	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.199	PBA	43933.1	2.0995	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.188	PBA	240635.1	5.0000	CLO4-89-ISTD

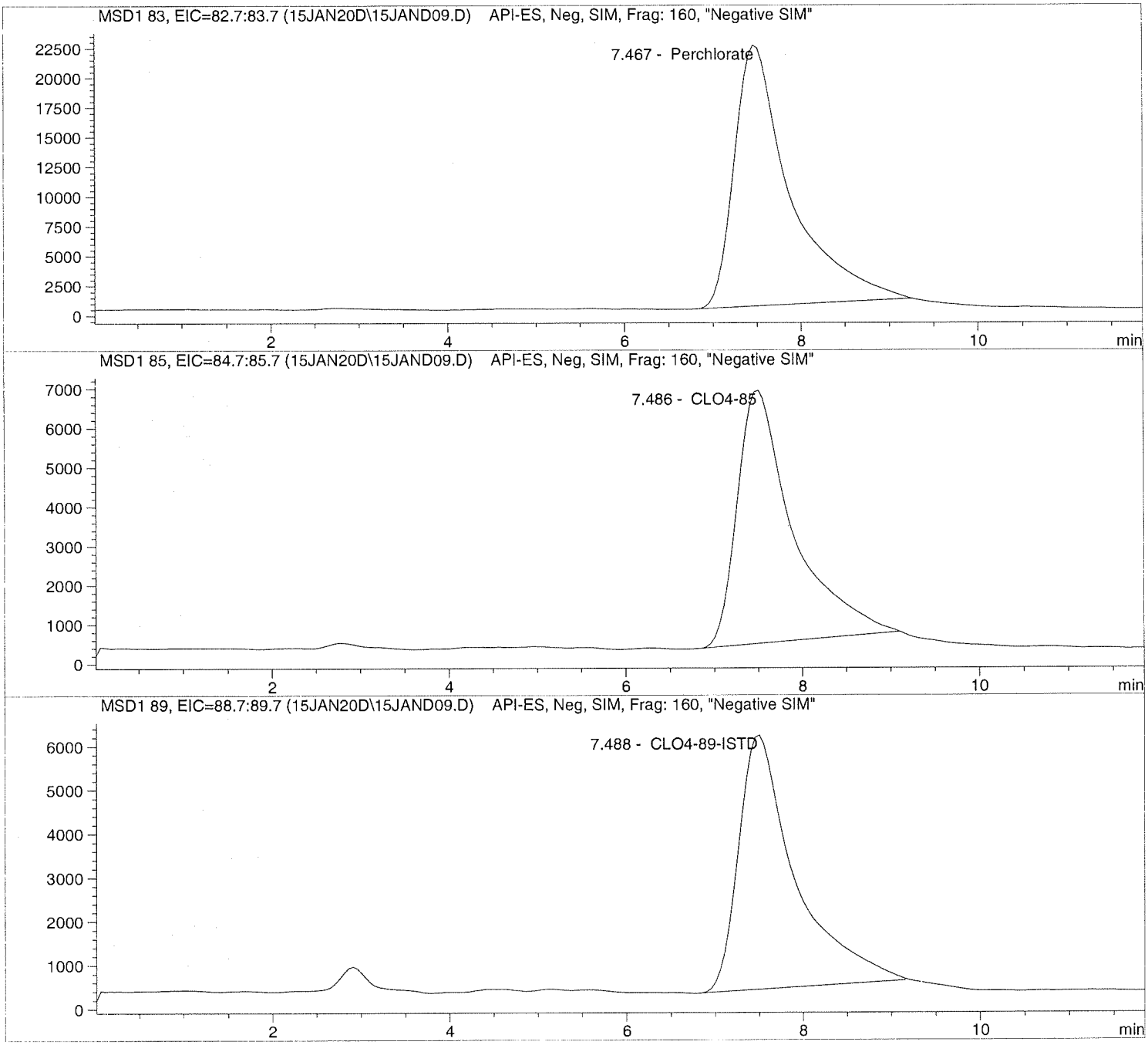
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\15JAN20D\15JAND09.D Sample Name: 2000952001 1K

Injection Date:	1/15/2020 11:04:28	Seq Line:	9
Sample Name:	2000952001 1K	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\15JAN20D\15JAND09.D Sample Name: 2000952001 1K

Injection Date:	1/15/2020 11:04:28	Seq Line:	9
Sample Name:	2000952001 1K	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:	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
7.467	PBA	969191.8	13367.4646	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.486	PBA	285347.1	12849.8345	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.488	PBA	259888.6	5000.0000	CLO4-89-ISTD

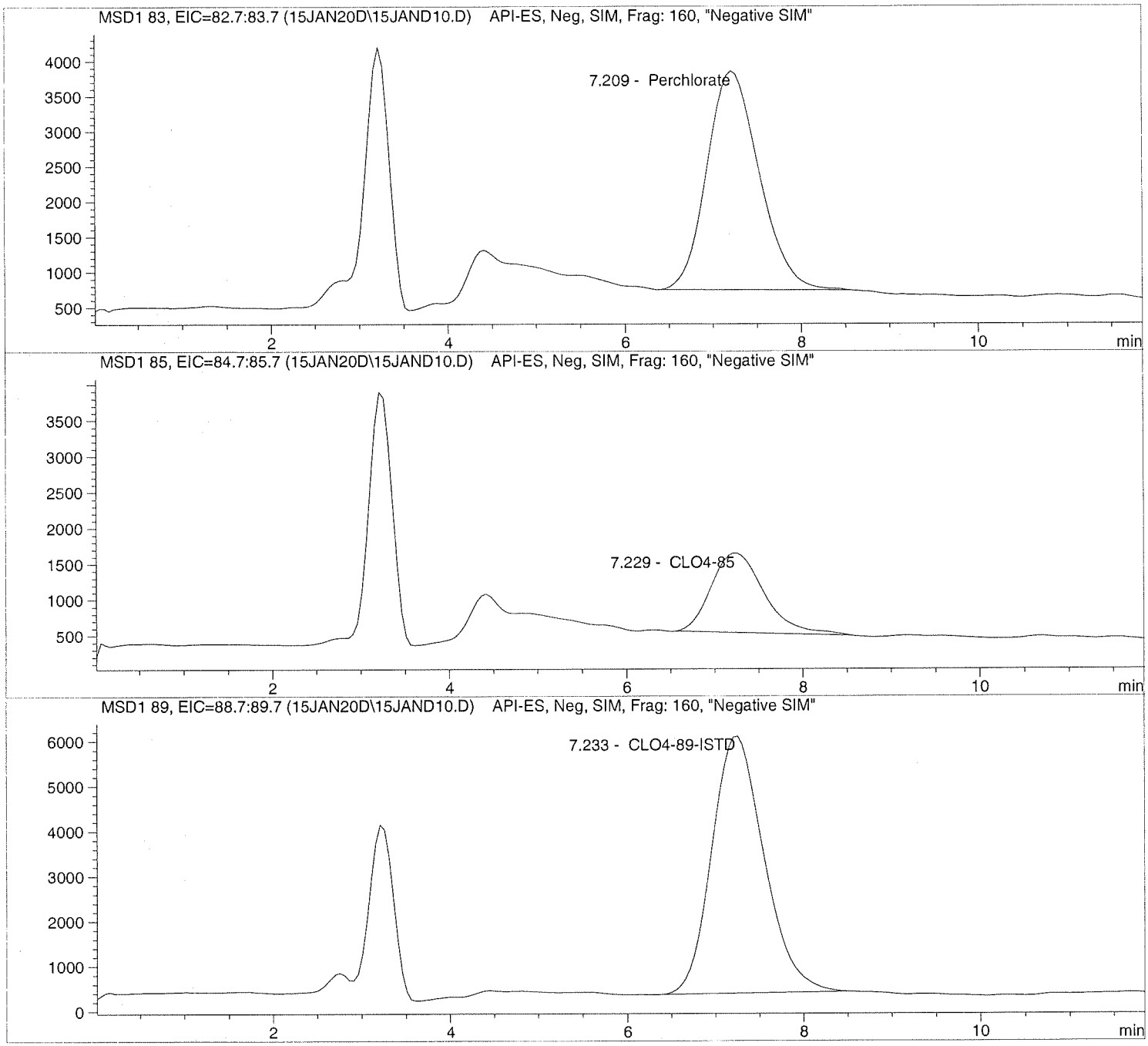
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\15JAN20D\15JAND10.D Sample Name: 2000953001

Injection Date:	1/15/2020 11:18:21	Seq Line:	10
Sample Name:	2000953001	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\15JAN20D\15JAND10.D Sample Name: 2000953001

Injection Date:	1/15/2020 11:18:21	Seq Line:	10
Sample Name:	2000953001	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
7.209	PBA	127923.8	1.9845	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.229	PBA	46374.8	2.2805	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.233	PBA	235039.6	5.0000	CLO4-89-ISTD

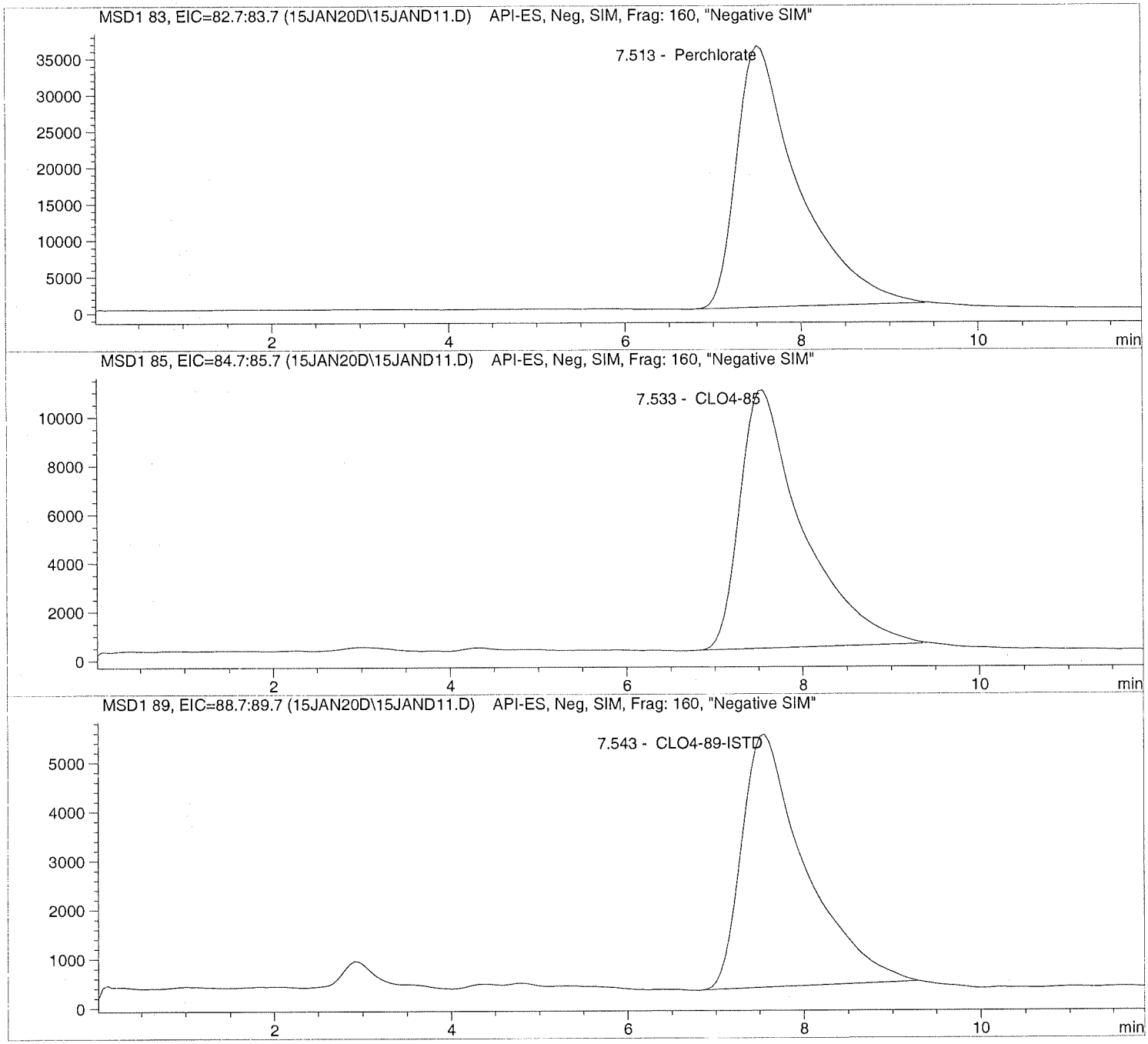
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\15JAN20D\15JAND11.D Sample Name: 691934 CCV@25

Injection Date:	1/15/2020 11:33:15	Seq Line:	11
Sample Name:	691934 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\15JAN20D\15JAND11.D Sample Name: 691934 CCV@25

Injection Date:	1/15/2020 11:33:15	Seq Line:	11
Sample Name:	691934 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
7.513	PBA	1751693.0	23.4055	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.533	PBA	525076.8	23.0255	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.543	PBA	257414.7	5.0000	CLO4-89-ISTD

*** End of Report ***

00968598

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Initial Calibration

Method C:\HPCHEM\1\METHODS\CLO4-DP3.M

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]	Sig	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]	Sig	Lvl	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

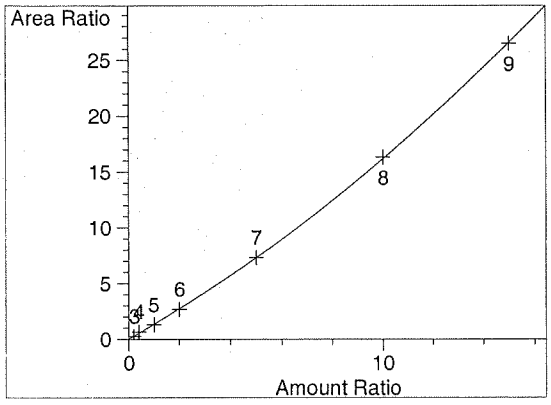
Compound: CLO4-89-ISTD
- Time Window : From 3.581 min To 11.896 min
- Curve Type : Linear
- Origin : Included
- Calibration Level Weights:/
  - Level 3 : 1
  - Level 4 : 1
  - Level 5 : 1
  - Level 6 : 1
  - Level 7 : 1
  - Level 8 : 1
  - Level 9 : 1

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

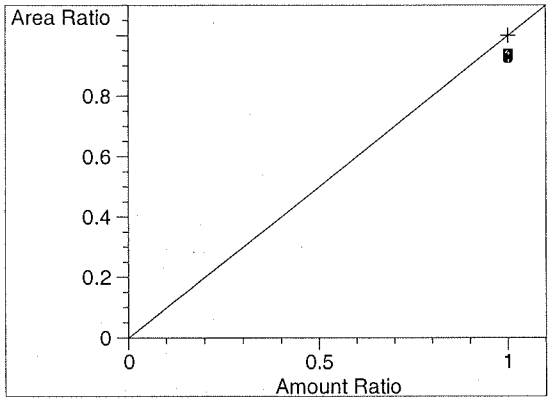
Peak Sum Table

No Entries in table

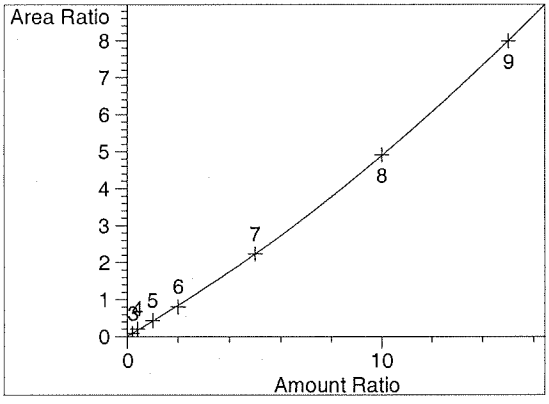
Calibration Curves



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

00968602

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:

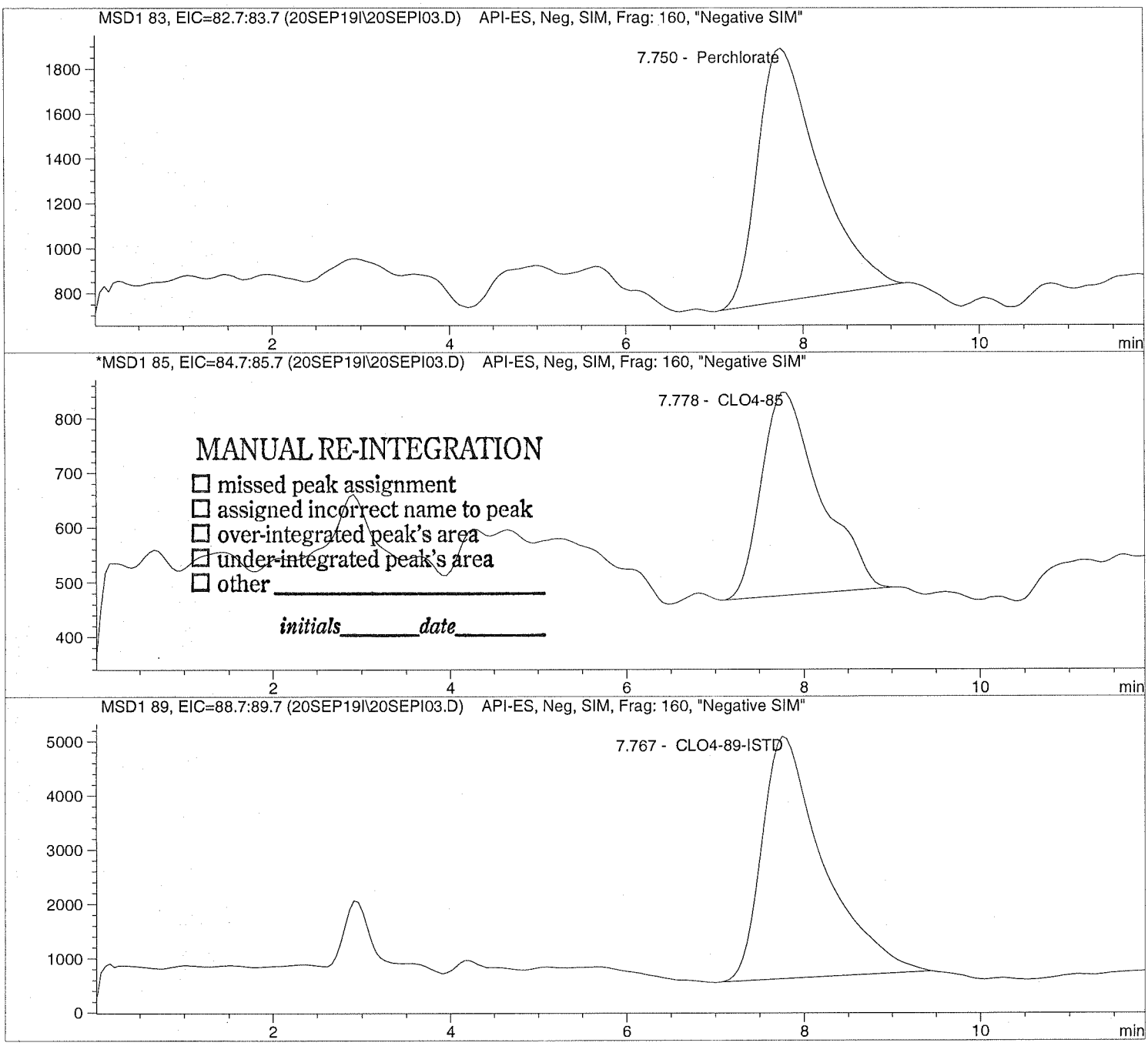
Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
1	Vial 71	CLO4@ 0.2ug/L	CLO4-AQN	1	Ctrl Samp		
2	Vial 72	CLO4@ 0.5ug/L	CLO4-AQN	1	Ctrl Samp		
3	Vial 73	CLO4@ 1.0ug/L	CLO4-AQN	1	Ctrl Samp		
4	Vial 74	CLO4@ 2.0ug/L	CLO4-AQN	1	Ctrl Samp		
5	Vial 75	CLO4@ 5.0ug/L	CLO4-AQN	1	Ctrl Samp		
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

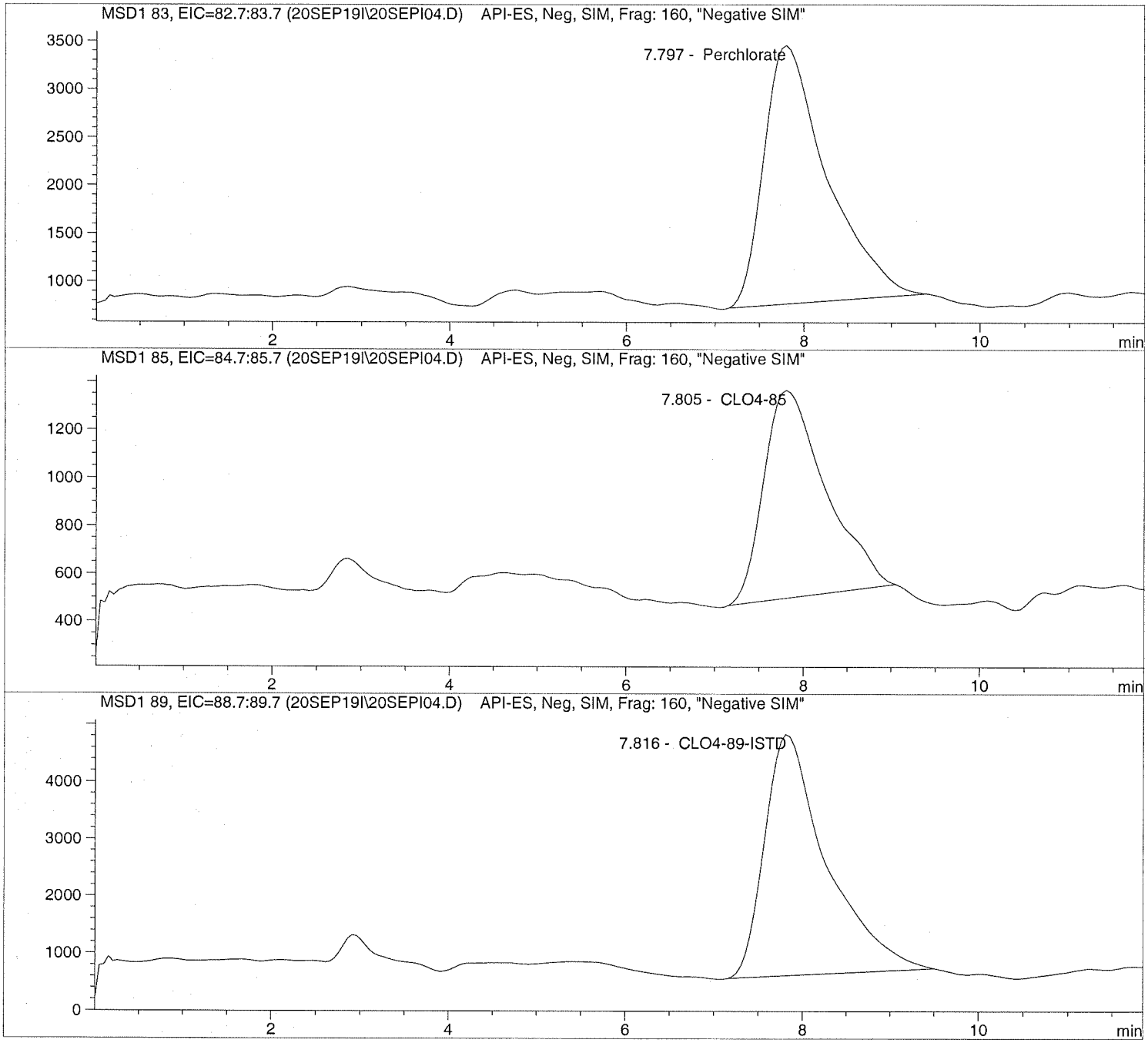
*** End of Report ***

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

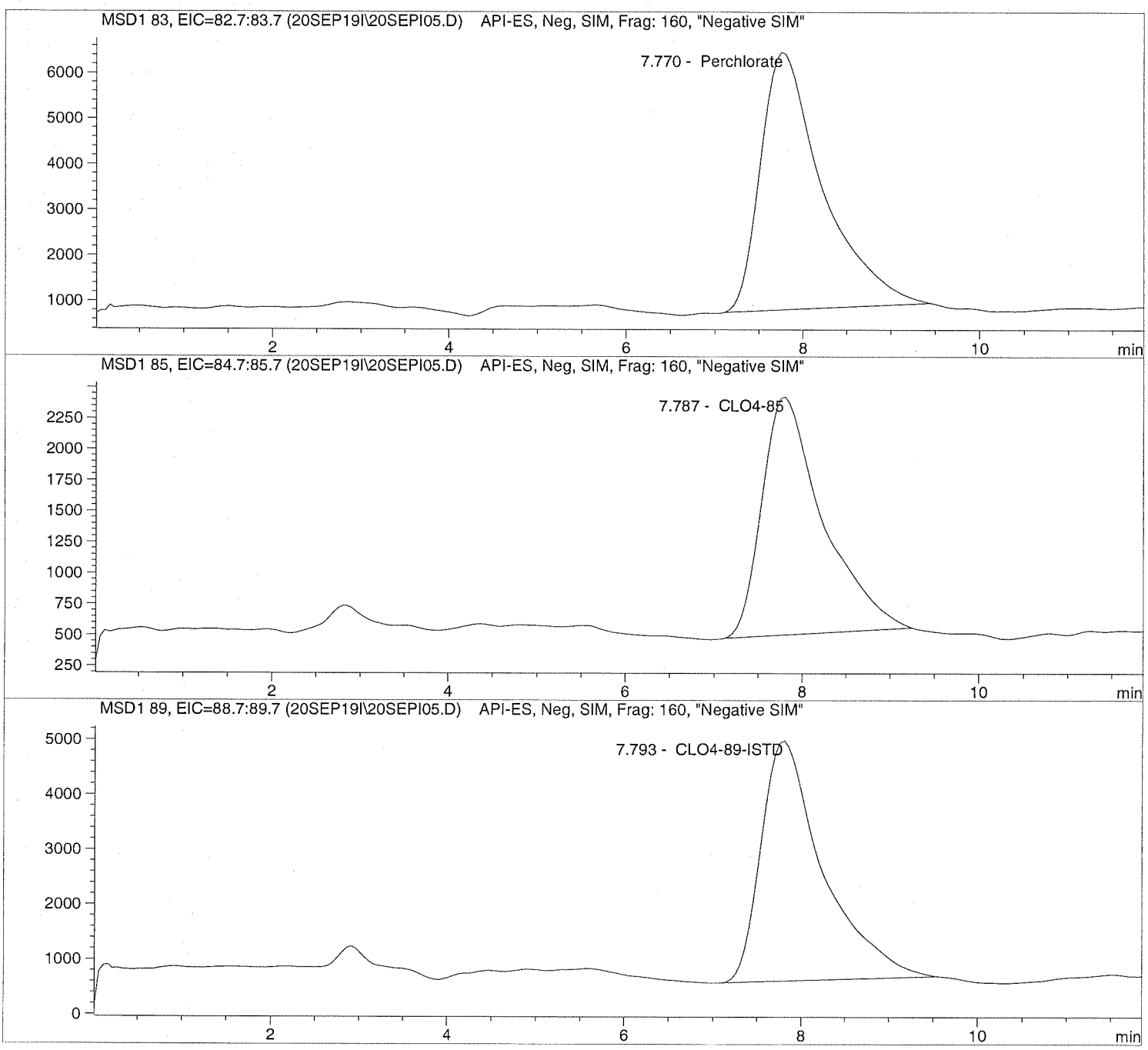
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\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

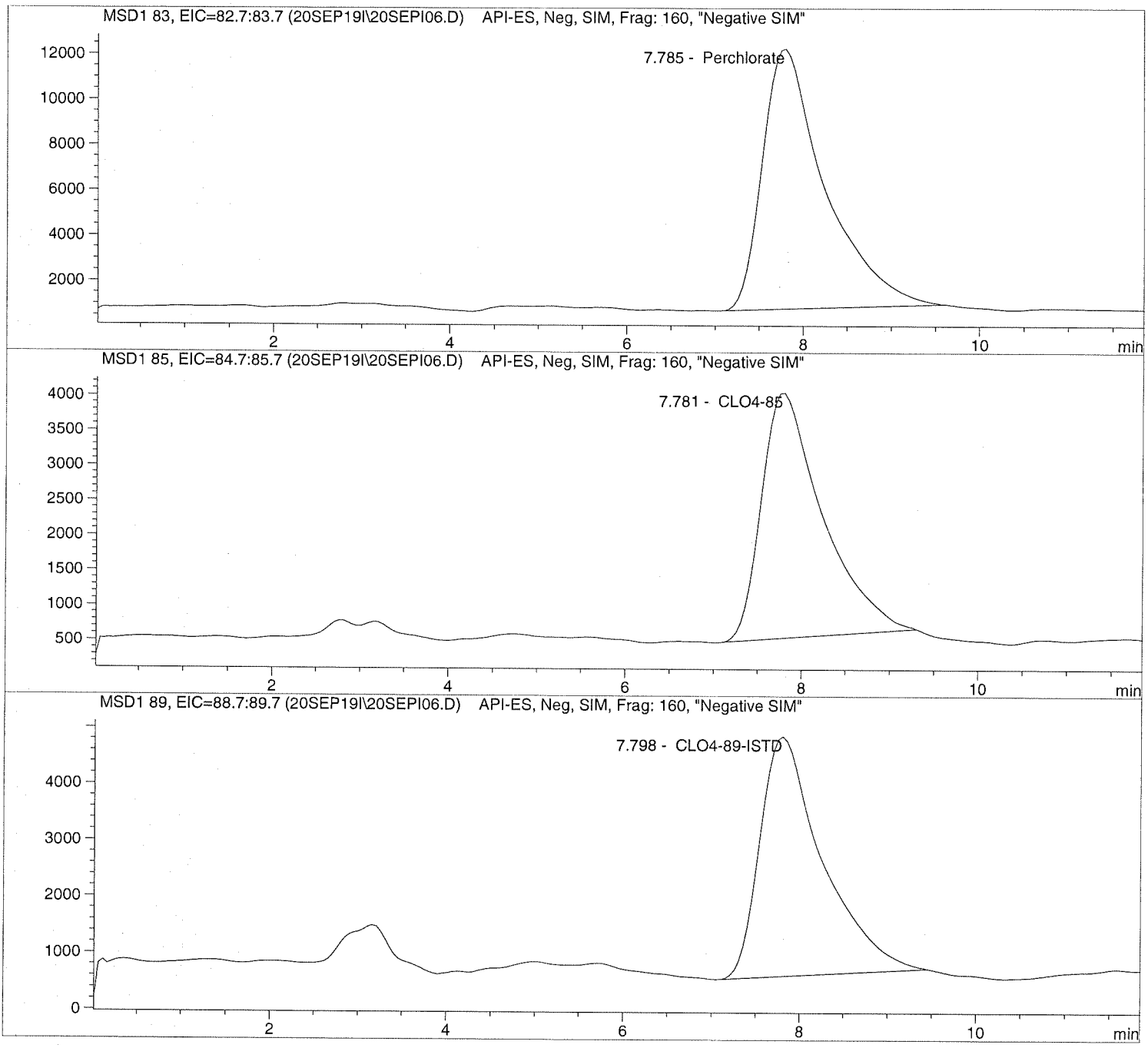
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI06.D Sample Name: CLO4@ 10.ug/L

Injection Date:	9/20/2019 10:05:36	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

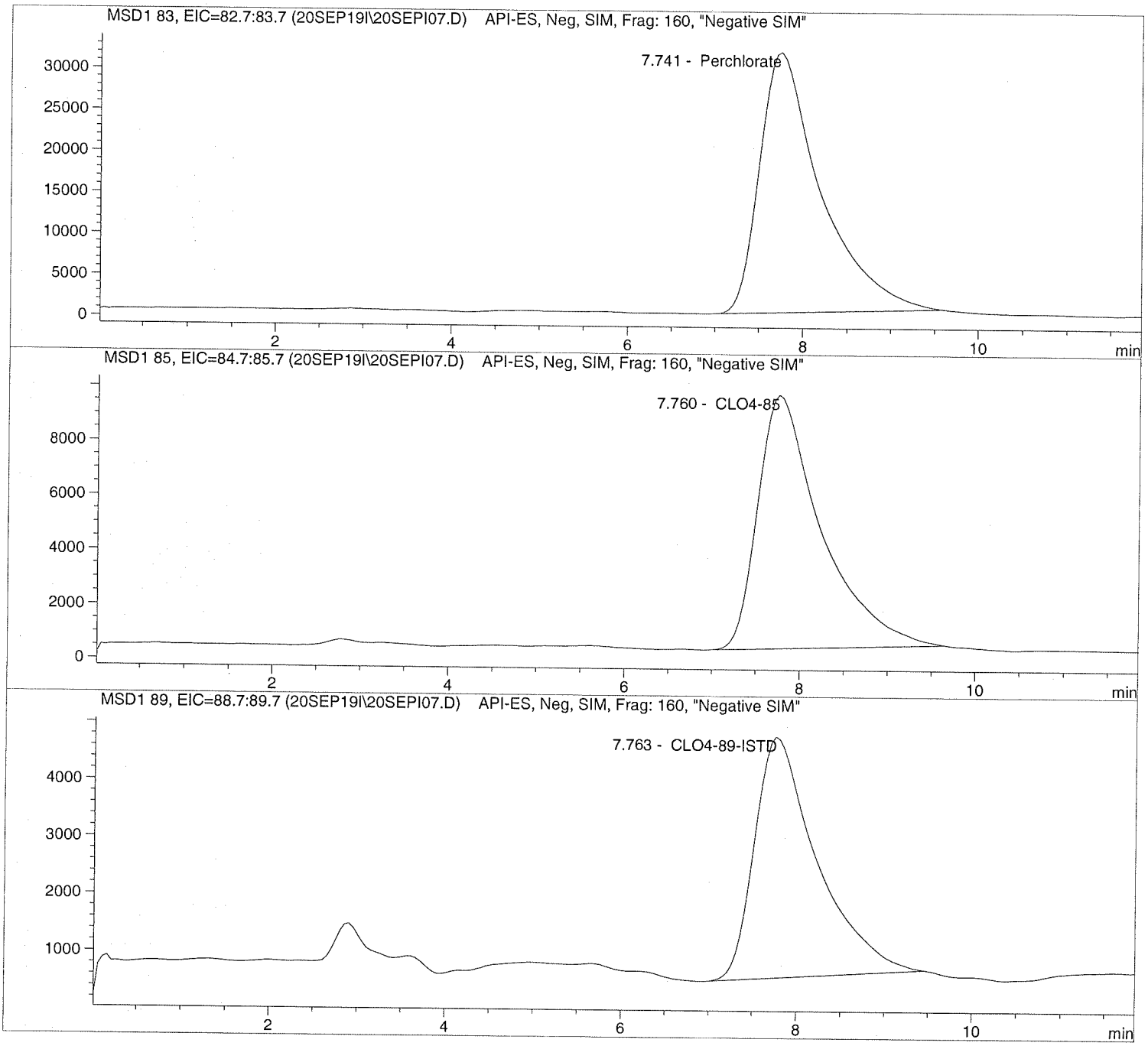
*** End of Report ***

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

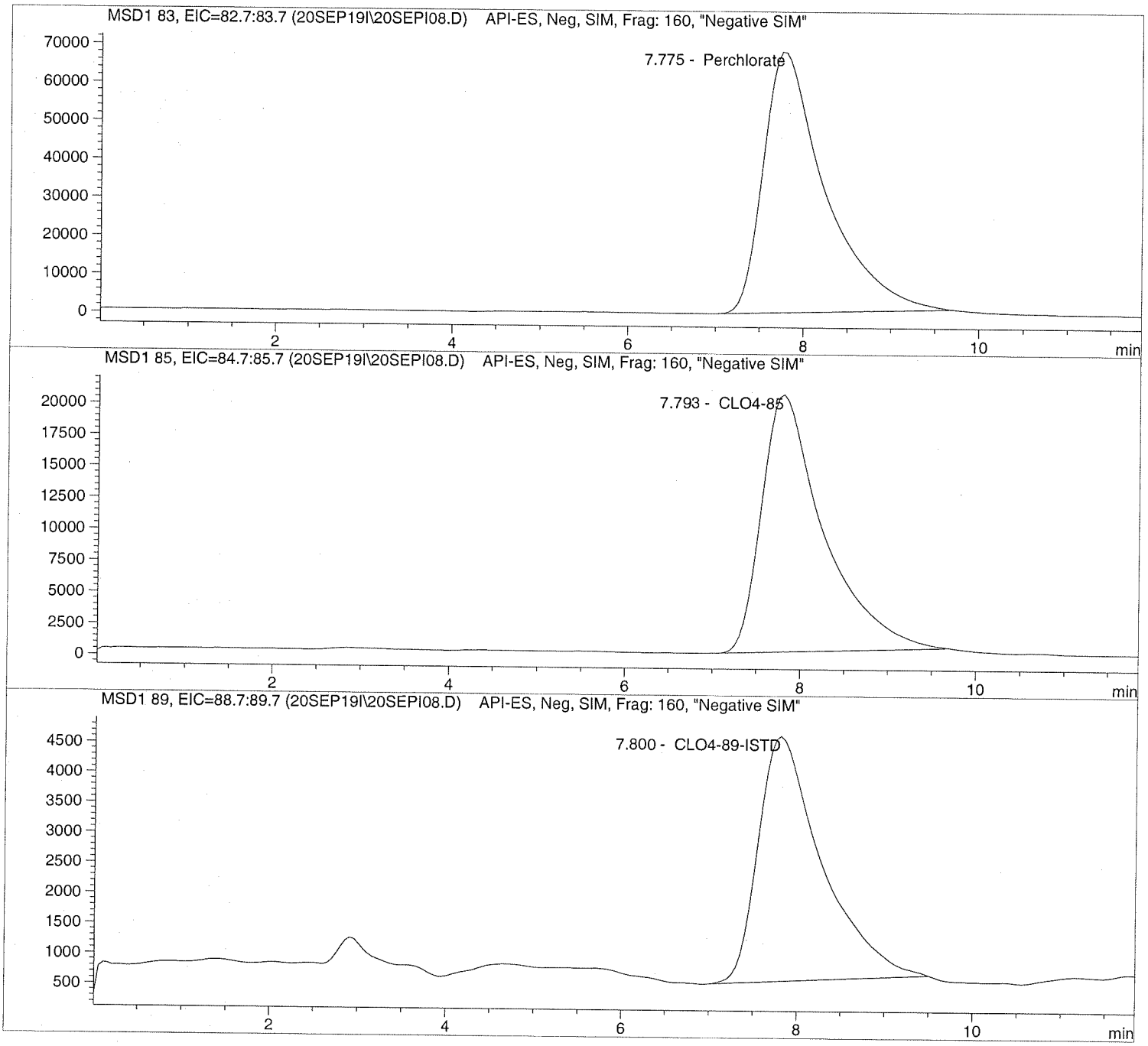
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\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

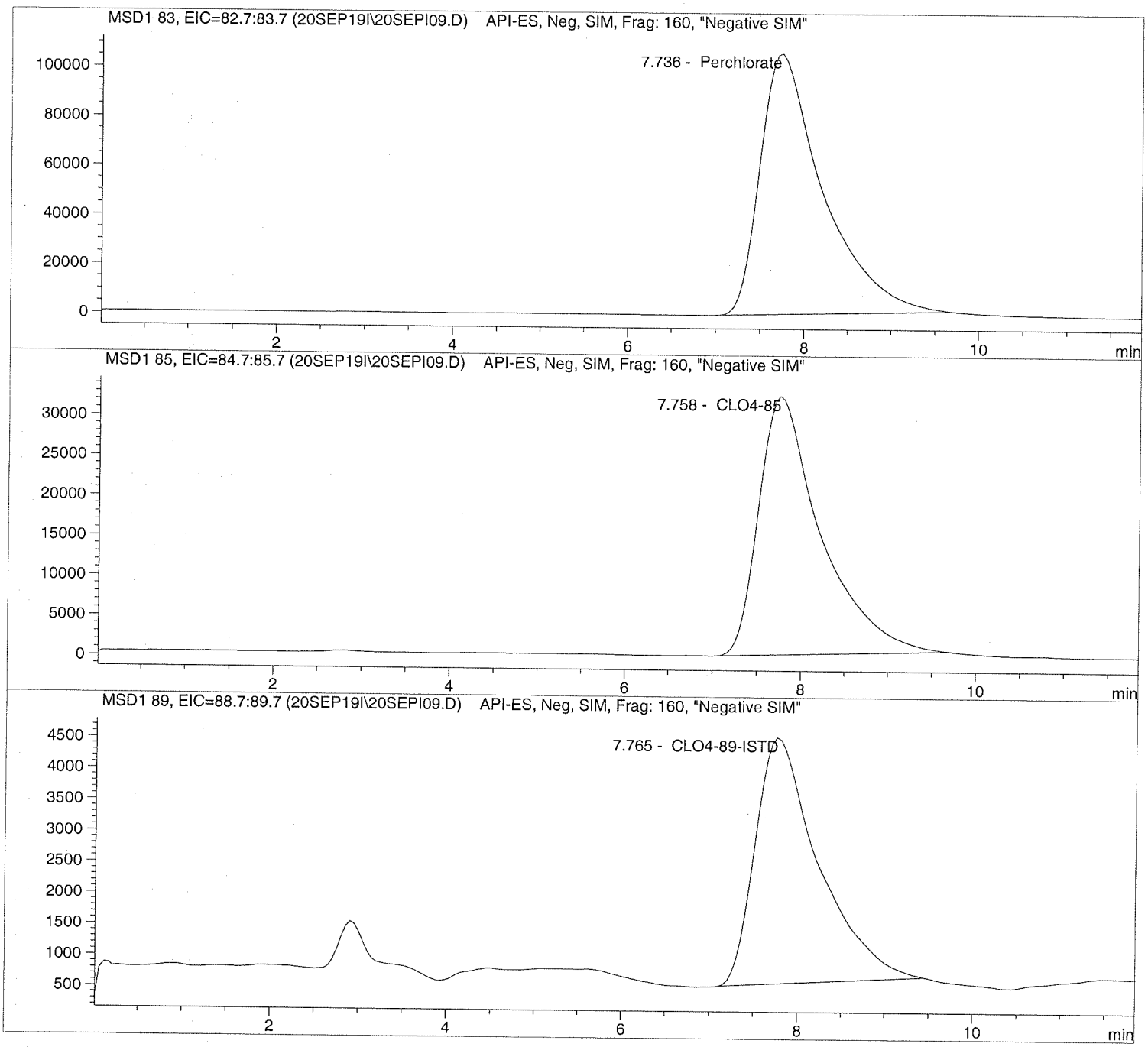
*** End of Report ***

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

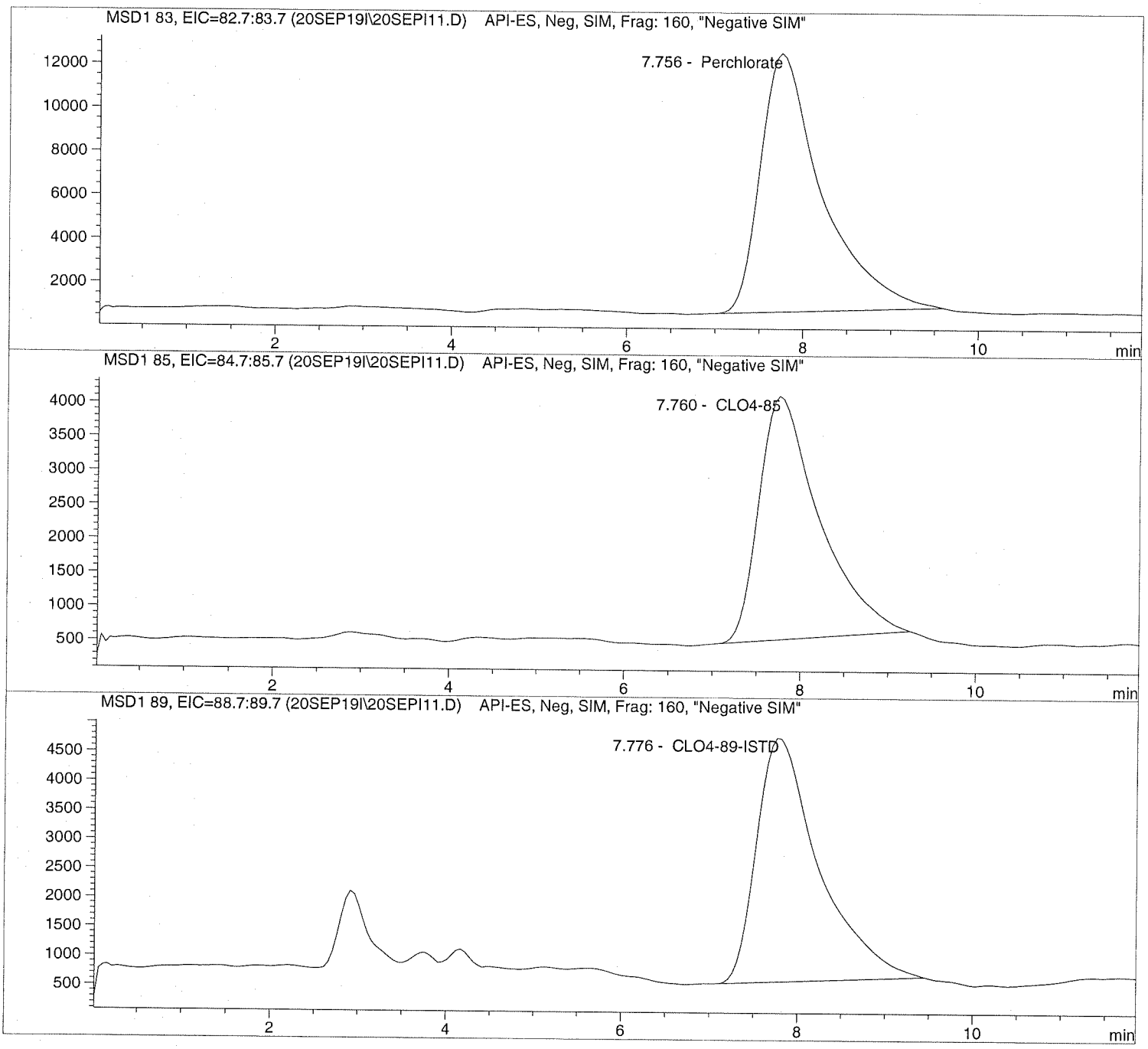
*** End of Report ***

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 ***

00968620

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

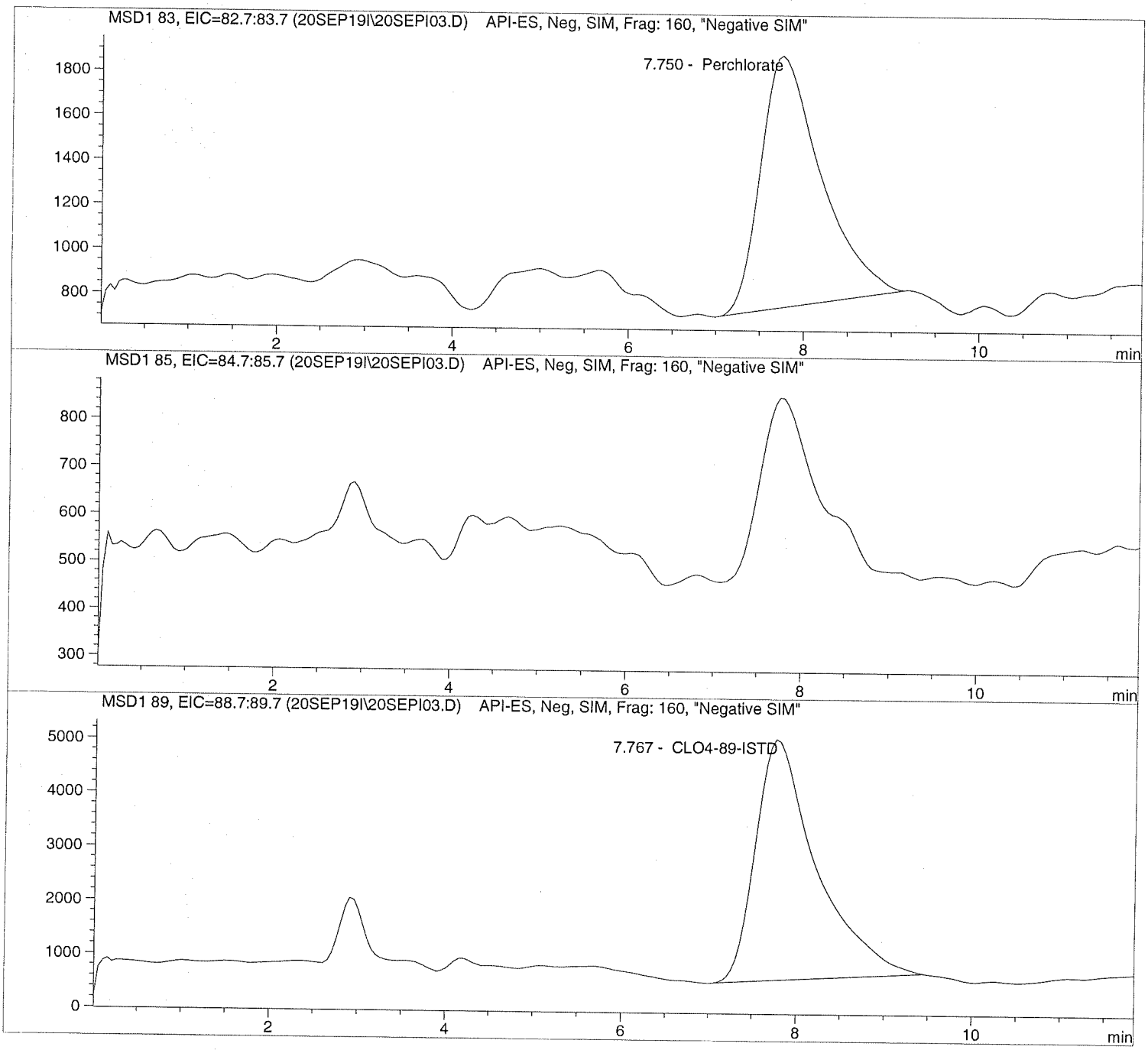
Unmodified

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
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January 20, 2020

Marcia Olive
Bhate Environmental Associates, Inc.
445 Union Blvd Ste 129
Lakewood, CO 80228

Work Order: **HS20010259**

Laboratory Results for: **Longhorn GW Treatment Plant Monthly Effluent Samples**

Dear Marcia,

ALS Environmental received 3 sample(s) on Jan 08, 2020 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: 20-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Monthly Effluent Samples
Work Order: HS20010259

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS20010259-01	LH18/24-SP650_010720	Water		07-Jan-2020 14:00	08-Jan-2020 08:58	☐
HS20010259-02	LH18/24-SP650_010720_BIX	Water		07-Jan-2020 14:00	08-Jan-2020 08:58	☐
HS20010259-03	Trip Blank	Water		07-Jan-2020 14:00	08-Jan-2020 08:58	☐

ALS Houston, US Date: 20-Jan-20

Client: Bhate Environmental Associates, Inc. **CASE NARRATIVE**
Project: Longhorn GW Treatment Plant Monthly Effluent Samples
Work Order: HS20010259

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: 149490

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

GCMS Volatiles by Method SW8260

Batch ID: R354311

Sample ID: CCV

• 1,2,3-Trichlorobenzene exceeded %D limits for CCV. Samples are ND for this compound.

Metals by Method SW6020

Batch ID: 149491

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

WetChemistry by Method SW7196

Batch ID: R354071

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

ALS Houston, US Date: 20-Jan-20

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**
Project: Longhorn GW Treatment Plant Monthly Effluent Samples WorkOrder:HS20010259
Sample ID: LH18/24-SP650_010720 Lab ID:HS20010259-01
Collection Date: 07-Jan-2020 14:00 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	13-Jan-2020 16:22
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	13-Jan-2020 16:22
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	13-Jan-2020 16:22
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	13-Jan-2020 16:22
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	13-Jan-2020 16:22
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	13-Jan-2020 16:22
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	13-Jan-2020 16:22
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	13-Jan-2020 16:22
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	13-Jan-2020 16:22
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	13-Jan-2020 16:22
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	13-Jan-2020 16:22
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	13-Jan-2020 16:22
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	13-Jan-2020 16:22
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	13-Jan-2020 16:22
1,2-Dichloroethane	**1.5**		**0.20**	**0.50**	**1.0**	**UG/L**	1	13-Jan-2020 16:22
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	13-Jan-2020 16:22
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	13-Jan-2020 16:22
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	13-Jan-2020 16:22
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	13-Jan-2020 16:22
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	13-Jan-2020 16:22
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	13-Jan-2020 16:22
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	13-Jan-2020 16:22
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	13-Jan-2020 16:22
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	13-Jan-2020 16:22
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	13-Jan-2020 16:22
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	13-Jan-2020 16:22
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	13-Jan-2020 16:22
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	13-Jan-2020 16:22
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	13-Jan-2020 16:22
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	13-Jan-2020 16:22
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	13-Jan-2020 16:22
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	13-Jan-2020 16:22
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	13-Jan-2020 16:22
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	13-Jan-2020 16:22
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	13-Jan-2020 16:22
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	13-Jan-2020 16:22
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	13-Jan-2020 16:22
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	13-Jan-2020 16:22
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	13-Jan-2020 16:22

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

ALS Houston, US Date: 20-Jan-20

Client: Bhate Environmental Associates, Inc.
ANALYTICAL REPORT
Project: Longhorn GW Treatment Plant Monthly Effluent Samples WorkOrder:HS20010259
Sample ID: LH18/24-SP650_010720 Lab ID:HS20010259-01
Collection Date: 07-Jan-2020 14:00 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	13-Jan-2020 16:22
cis-1,2-Dichloroethene	**29**		**0.20**	**0.50**	**1.0**	**UG/L**	1	13-Jan-2020 16:22
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	13-Jan-2020 16:22
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	13-Jan-2020 16:22
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	13-Jan-2020 16:22
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	13-Jan-2020 16:22
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	13-Jan-2020 16:22
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	13-Jan-2020 16:22
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	13-Jan-2020 16:22
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	13-Jan-2020 16:22
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	13-Jan-2020 16:22
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	13-Jan-2020 16:22
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	13-Jan-2020 16:22
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	13-Jan-2020 16:22
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	13-Jan-2020 16:22
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	13-Jan-2020 16:22
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	13-Jan-2020 16:22
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	13-Jan-2020 16:22
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	13-Jan-2020 16:22
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	13-Jan-2020 16:22
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	13-Jan-2020 16:22
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	13-Jan-2020 16:22
Trichloroethene	**5.0**		**0.20**	**0.50**	**1.0**	**UG/L**	1	13-Jan-2020 16:22
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	13-Jan-2020 16:22
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	13-Jan-2020 16:22
Surr: 1,2-Dichloroethane-d4	*94.8*			**0**	*81-118*	*%REC*	*1*	*13-Jan-2020 16:22*
Surr: 4-Bromofluorobenzene	*94.2*			**0**	*85-114*	*%REC*	*1*	*13-Jan-2020 16:22*
Surr: Dibromofluoromethane	*94.8*			**0**	*80-119*	*%REC*	*1*	*13-Jan-2020 16:22*
Surr: Toluene-d8	*97.1*			**0**	*89-112*	*%REC*	*1*	*13-Jan-2020 16:22*
SEMIVOLATILES SIM		**Method:SW8270SIM**				Prep:SW3510 / 09-Jan-2020		Analyst: LG
1,4-Dioxane	**18**		**1.0**	**0**	**1.0**	**ug/L**	100	14-Jan-2020 10:16
Surr: 2-Fluorobiphenyl	*114*			**0**	*40-140*	*%REC*	*100*	*14-Jan-2020 10:16*
Surr: 4-Terphenyl-d14	*104*			**0**	*40-140*	*%REC*	*100*	*14-Jan-2020 10:16*
Surr: Nitrobenzene-d5	*81.8*			**0**	*40-140*	*%REC*	*100*	*14-Jan-2020 10:16*
METALS BY ICPMS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 09-Jan-2020		Analyst: JHD
Barium	**0.0666**		**0.00190**	**0.00250**	**0.00500**	**mg/L**	1	10-Jan-2020 10:48
Lead	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	10-Jan-2020 10:48
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	10-Jan-2020 10:48
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	10-Jan-2020 10:48

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

ALS Houston, US Date: 20-Jan-20

Client: Bhate Environmental Associates, Inc.

ANALYTICAL REPORT

Project: Longhorn GW Treatment Plant Monthly Effluent Samples WorkOrder:HS20010259

Sample ID: LH18/24-SP650_010720 Lab ID:HS20010259-01

Collection Date: 07-Jan-2020 14:00 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
HEXAVALENT CHROMIUM BY SW7196A		**Method:SW7196**						Analyst: MZD
Chromium, Hexavalent	0.0100	U	0.00600	0.0100	0.0100	mg/L	1	08-Jan-2020 13:41

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

ALS Houston, US Date: 20-Jan-20

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**

Project: Longhorn GW Treatment Plant Monthly Effluent Samples WorkOrder:HS20010259

Sample ID: LH18/24-SP650_010720_BIX Lab ID:HS20010259-02

Collection Date: 07-Jan-2020 14:00 Matrix:Water

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	15-Jan-2020 16:41

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

ALS Houston, US Date: 20-Jan-20

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**
Project: Longhorn GW Treatment Plant Monthly Effluent Samples WorkOrder:HS20010259
Sample ID: Trip Blank Lab ID:HS20010259-03
Collection Date: 07-Jan-2020 14:00 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	13-Jan-2020 15:58
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	13-Jan-2020 15:58
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	13-Jan-2020 15:58
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	13-Jan-2020 15:58
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	13-Jan-2020 15:58
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	13-Jan-2020 15:58
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	13-Jan-2020 15:58
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	13-Jan-2020 15:58
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	13-Jan-2020 15:58
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	13-Jan-2020 15:58
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	13-Jan-2020 15:58
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	13-Jan-2020 15:58
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	13-Jan-2020 15:58
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	13-Jan-2020 15:58
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	13-Jan-2020 15:58
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	13-Jan-2020 15:58
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	13-Jan-2020 15:58
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	13-Jan-2020 15:58
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	13-Jan-2020 15:58
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	13-Jan-2020 15:58
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	13-Jan-2020 15:58
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	13-Jan-2020 15:58
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	13-Jan-2020 15:58
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	13-Jan-2020 15:58
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	13-Jan-2020 15:58
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	13-Jan-2020 15:58
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	13-Jan-2020 15:58
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	13-Jan-2020 15:58
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	13-Jan-2020 15:58
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	13-Jan-2020 15:58
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	13-Jan-2020 15:58
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	13-Jan-2020 15:58
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	13-Jan-2020 15:58
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	13-Jan-2020 15:58
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	13-Jan-2020 15:58
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	13-Jan-2020 15:58
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	13-Jan-2020 15:58
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	13-Jan-2020 15:58
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	13-Jan-2020 15:58

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

ALS Houston, US Date: 20-Jan-20

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**

Project: Longhorn GW Treatment Plant Monthly Effluent Samples WorkOrder:HS20010259

Sample ID: Trip Blank Lab ID:HS20010259-03

Collection Date: 07-Jan-2020 14:00 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	13-Jan-2020 15:58
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	13-Jan-2020 15:58
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	13-Jan-2020 15:58
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	13-Jan-2020 15:58
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	13-Jan-2020 15:58
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	13-Jan-2020 15:58
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	13-Jan-2020 15:58
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	13-Jan-2020 15:58
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	13-Jan-2020 15:58
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	13-Jan-2020 15:58
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	13-Jan-2020 15:58
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	13-Jan-2020 15:58
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	13-Jan-2020 15:58
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	13-Jan-2020 15:58
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	13-Jan-2020 15:58
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	13-Jan-2020 15:58
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	13-Jan-2020 15:58
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	13-Jan-2020 15:58
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	13-Jan-2020 15:58
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	13-Jan-2020 15:58
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	13-Jan-2020 15:58
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	13-Jan-2020 15:58
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	13-Jan-2020 15:58
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	13-Jan-2020 15:58
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	13-Jan-2020 15:58
Surr: 1,2-Dichloroethane-d4	*95.0*			**0**	*81-118*	*%REC*	*1*	*13-Jan-2020 15:58*
Surr: 4-Bromofluorobenzene	*93.1*			**0**	*85-114*	*%REC*	*1*	*13-Jan-2020 15:58*
Surr: Dibromofluoromethane	*96.5*			**0**	*80-119*	*%REC*	*1*	*13-Jan-2020 15:58*
Surr: Toluene-d8	*98.2*			**0**	*89-112*	*%REC*	*1*	*13-Jan-2020 15:58*

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

Weight / Prep Log

Client: Bhate Environmental Associates, Inc.

Project: Longhorn GW Treatment Plant Monthly Effluent Samples

WorkOrder: HS20010259

Batch ID: 149490 **Start Date:** 09 Jan 2020 07:56 **End Date:** 09 Jan 2020 12:00

Method: SV AQ SEP FUN EXTRACT-LOWLEV - 3510C **Prep Code:** 3510_B_SIM

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS20010259-01	1	990 (mL)	1 (mL)	0.00101

Batch ID: 149491 **Start Date:** 09 Jan 2020 08:30 **End Date:** 09 Jan 2020 12:30

Method: WATER - SW3010A **Prep Code:** 3010A

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS20010259-01		10 (mL)	10 (mL)	1

ALS Houston, US Date: 20-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder: HS20010259

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: 149490 (1)	**Test Name :** SEMIVOLATILES SIM				**Matrix:** Water	
HS20010259-01	LH18/24-SP650_010720	07 Jan 2020 14:00		09 Jan 2020 07:56	14 Jan 2020 10:16	100
Batch ID: 149491 (0)	**Test Name :** METALS BY ICPMS BY SW6020A				**Matrix:** Water	
HS20010259-01	LH18/24-SP650_010720	07 Jan 2020 14:00		09 Jan 2020 12:30	10 Jan 2020 10:48	1
Batch ID: R354071 (0)	**Test Name :** HEXAVALENT CHROMIUM BY SW7196A				**Matrix:** Water	
HS20010259-01	LH18/24-SP650_010720	07 Jan 2020 14:00			08 Jan 2020 13:41	1
Batch ID: R354311 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Water	
HS20010259-01	LH18/24-SP650_010720	07 Jan 2020 14:00			13 Jan 2020 16:22	1
HS20010259-03	Trip Blank	07 Jan 2020 14:00			13 Jan 2020 15:58	1
Batch ID: R354450 (0)	**Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)				**Matrix:** Water	
HS20010259-02	LH18/24-SP650_010720_BIX	07 Jan 2020 14:00			15 Jan 2020 16:41	1

ALS Houston, US Date: 20-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder: HS20010259

QC BATCH REPORT

Batch ID: 149491 (0) **Instrument: ICPMS04** **Method: METALS BY ICPMS BY SW6020A**

MBLK Sample ID: **MBLK-149491** Units: **mg/L** Analysis Date: **10-Jan-2020 10:41**
Client ID: Run ID: **ICPMS04_354209** SeqNo: **5431495** PrepDate: **09-Jan-2020** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Barium	0.00250	0.00500								U
Lead	0.00100	0.00500								U
Selenium	0.00250	0.00500								U
Silver	0.000500	0.00500								U

LCS Sample ID: **LCS-149491** Units: **mg/L** Analysis Date: **10-Jan-2020 10:43**
Client ID: Run ID: **ICPMS04_354209** SeqNo: **5431496** PrepDate: **09-Jan-2020** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Barium	0.04977	0.00500	0.05	0	99.5	86 - 114				
Lead	0.05054	0.00500	0.05	0	101	88 - 115				
Selenium	0.05181	0.00500	0.05	0	104	80 - 120				
Silver	0.04759	0.00500	0.05	0	95.2	85 - 116				

MS Sample ID: **HS20010259-01MS** Units: **mg/L** Analysis Date: **10-Jan-2020 10:59**
Client ID: **LH18/24-SP650_010720** Run ID: **ICPMS04_354209** SeqNo: **5431503** PrepDate: **09-Jan-2020** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Barium	0.1181	0.00500	0.05	0.0666	103	86 - 114				
Lead	0.04698	0.00500	0.05	0.000065	93.8	88 - 115				
Selenium	0.0519	0.00500	0.05	0.000048	104	80 - 120				
Silver	0.04508	0.00500	0.05	0.000021	90.1	85 - 116				

MSD Sample ID: **HS20010259-01MSD** Units: **mg/L** Analysis Date: **10-Jan-2020 10:54**
Client ID: **LH18/24-SP650_010720** Run ID: **ICPMS04_354209** SeqNo: **5431501** PrepDate: **09-Jan-2020** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Barium	0.1173	0.00500	0.05	0.0666	101	86 - 114	0.09848	17.4	20	
Lead	0.04801	0.00500	0.05	0.000065	95.9	88 - 115	0.0422	12.9	20	
Selenium	0.0517	0.00500	0.05	0.000048	103	80 - 120	0.05365	3.7	20	
Silver	0.04487	0.00500	0.05	0.000021	89.7	85 - 116	0.03847	15.4	20	

ALS Houston, US Date: 20-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder: HS20010259

QC BATCH REPORT

Batch ID: 149491 (0) **Instrument: ICPMS04** **Method: METALS BY ICPMS BY SW6020A**

PDS Sample ID: **HS20010259-01PDS** Units: **mg/L** Analysis Date: **10-Jan-2020 10:56**
Client ID: **LH18/24-SP650_010720** Run ID: **ICPMS04_354209** SeqNo: **5431502** PrepDate: **09-Jan-2020** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Barium	0.1759	0.00500	0.1	0.0666	109	80 - 120				
Lead	0.1067	0.00500	0.1	0.000065	107	80 - 120				
Silver	0.08495	0.00500	0.1	0.000021	84.9	80 - 120				

SD Sample ID: **HS20010259-01SD** Units: **mg/L** Analysis Date: **10-Jan-2020 10:50**
Client ID: **LH18/24-SP650_010720** Run ID: **ICPMS04_354209** SeqNo: **5431499** PrepDate: **09-Jan-2020** DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Barium	0.06843	0.0250					0.0666	2.76	10	
Lead	0.00500	0.0250					0.000065	0	10	U
Selenium	0.0125	0.0250					0.000048	0	10	U
Silver	0.00250	0.0250					0.000021	0	10	U

The following samples were analyzed in this batch: HS20010259-01

ALS Houston, US Date: 20-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder: HS20010259

QC BATCH REPORT

Batch ID: 149490 (1) **Instrument: SV-6** **Method: SEMIVOLATILES SIM**

MBLK Sample ID: **MBLK-149490** Units: **ug/L** Analysis Date: **14-Jan-2020 08:56**
Client ID: Run ID: **SV-6_354345** SeqNo: **5434000** PrepDate: **09-Jan-2020** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,4-Dioxane	0	0.010								U
Surr: 2-Fluorobiphenyl	*0.09693*	*0*	*0.08*	*0*	*121*	*40 - 140*				
Surr: 4-Terphenyl-d14	*0.07831*	*0*	*0.08*	*0*	*97.9*	*40 - 140*				
Surr: Nitrobenzene-d5	*0.1017*	*0*	*0.08*	*0*	*127*	*40 - 140*				

LCS Sample ID: **LCS-149490** Units: **ug/L** Analysis Date: **14-Jan-2020 09:15**
Client ID: Run ID: **SV-6_354345** SeqNo: **5434001** PrepDate: **09-Jan-2020** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,4-Dioxane	0.09126	0.010	0.08	0	114	40 - 140				
Surr: 2-Fluorobiphenyl	*0.08336*	*0*	*0.08*	*0*	*104*	*40 - 140*				
Surr: 4-Terphenyl-d14	*0.06743*	*0*	*0.08*	*0*	*84.3*	*40 - 140*				
Surr: Nitrobenzene-d5	*0.07441*	*0*	*0.08*	*0*	*93.0*	*40 - 140*				

LCSD Sample ID: **LCSD-149490** Units: **ug/L** Analysis Date: **14-Jan-2020 09:34**
Client ID: Run ID: **SV-6_354345** SeqNo: **5434002** PrepDate: **09-Jan-2020** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,4-Dioxane	0.09831	0.010	0.08	0	123	40 - 140	0.09126	7.43	20	
Surr: 2-Fluorobiphenyl	*0.08666*	*0*	*0.08*	*0*	*108*	*40 - 140*	*0.08336*	*3.88*	*20*	
Surr: 4-Terphenyl-d14	*0.0682*	*0*	*0.08*	*0*	*85.2*	*40 - 140*	*0.06743*	*1.13*	*20*	
Surr: Nitrobenzene-d5	*0.07263*	*0*	*0.08*	*0*	*90.8*	*40 - 140*	*0.07441*	*2.42*	*20*	

The following samples were analyzed in this batch: HS20010259-01

ALS Houston, US Date: 20-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder: HS20010259

QC BATCH REPORT

Batch ID: R354311 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-200113** Units: **UG/L** Analysis Date: **13-Jan-2020 15:34**
Client ID: Run ID: **VOA6_354311** SeqNo: **5433241** 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: 20-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder: HS20010259

QC BATCH REPORT

Batch ID: R354311 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-200113** Units: **UG/L** Analysis Date: **13-Jan-2020 15:34**
Client ID: Run ID: **VOA6_354311** SeqNo: **5433241** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	1.0	2.0								U
Carbon tetrachloride	0.50	1.0								U
Chlorobenzene	0.50	1.0								U
Chloroethane	0.50	1.0								U
Chloroform	0.50	1.0								U
Chloromethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
cis-1,3-Dichloropropene	0.50	1.0								U
Dibromochloromethane	0.50	1.0								U
Dibromomethane	0.50	1.0								U
Dichlorodifluoromethane	0.50	1.0								U
Ethylbenzene	0.50	1.0								U
Hexachlorobutadiene	1.0	1.0								U
Isopropylbenzene	0.50	1.0								U
m,p-Xylene	1.0	2.0								U
Methylene chloride	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	*47.03*	*1.0*	*50*	*0*	*94.1*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*47.67*	*1.0*	*50*	*0*	*95.3*	*85 - 114*				
Surr: Dibromofluoromethane	*47.7*	*1.0*	*50*	*0*	*95.4*	*80 - 119*				
Surr: Toluene-d8	*48.94*	*1.0*	*50*	*0*	*97.9*	*89 - 112*				

ALS Houston, US Date: 20-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder: HS20010259

QC BATCH REPORT

Batch ID: R354311 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

LCS Sample ID: **VLCSW-200113** Units: **UG/L** Analysis Date: **13-Jan-2020 14:46**
Client ID: Run ID: **VOA6_354311** SeqNo: **5433240** 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	20.93	1.0	20	0	105	78 - 124				
1,1,1-Trichloroethane	20.95	1.0	20	0	105	74 - 131				
1,1,2,2-Tetrachloroethane	19.81	1.0	20	0	99.1	71 - 121				
1,1,2-Trichloroethane	19.73	1.0	20	0	98.6	80 - 119				
1,1-Dichloroethane	20.02	1.0	20	0	100	77 - 125				
1,1-Dichloroethene	20.61	1.0	20	0	103	71 - 131				
1,1-Dichloropropene	19.16	1.0	20	0	95.8	78 - 125				
1,2,3-Trichlorobenzene	21.55	1.0	20	0	108	69 - 129				
1,2,3-Trichloropropane	19.99	1.0	20	0	100.0	73 - 122				
1,2,4-Trichlorobenzene	21.2	1.0	20	0	106	69 - 130				
1,2,4-Trimethylbenzene	20.35	1.0	20	0	102	76 - 124				
1,2-Dibromo-3-chloropropane	21.2	1.0	20	0	106	62 - 128				
1,2-Dibromoethane	21	1.0	20	0	105	77 - 121				
1,2-Dichlorobenzene	20.72	1.0	20	0	104	80 - 119				
1,2-Dichloroethane	20.9	1.0	20	0	104	73 - 128				
1,2-Dichloropropane	19.2	1.0	20	0	96.0	78 - 122				
1,3,5-Trimethylbenzene	20.64	1.0	20	0	103	75 - 124				
1,3-Dichlorobenzene	21	1.0	20	0	105	80 - 119				
1,3-Dichloropropane	19.73	1.0	20	0	98.7	80 - 119				
1,4-Dichlorobenzene	21.01	1.0	20	0	105	79 - 118				
2,2-Dichloropropane	20.53	1.0	20	0	103	60 - 139				
2-Butanone	36.52	2.0	40	0	91.3	56 - 143				
2-Chlorotoluene	21.16	1.0	20	0	106	79 - 122				
2-Hexanone	35.29	2.0	40	0	88.2	57 - 139				
4-Chlorotoluene	20.66	1.0	20	0	103	78 - 122				
4-Isopropyltoluene	20.01	1.0	20	0	100	77 - 127				
4-Methyl-2-pentanone	36.4	2.0	40	0	91.0	67 - 130				
Acetone	42.48	2.0	40	0	106	39 - 160				
Benzene	20.18	1.0	20	0	101	79 - 120				
Bromobenzene	21.65	1.0	20	0	108	80 - 120				
Bromochloromethane	21.33	1.0	20	0	107	78 - 123				
Bromodichloromethane	20.87	1.0	20	0	104	79 - 125				
Bromoform	21.45	1.0	20	0	107	66 - 130				
Bromomethane	16.2	1.0	20	0	81.0	53 - 141				

ALS Houston, US Date: 20-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder: HS20010259

QC BATCH REPORT

Batch ID: R354311 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

LCS Sample ID: **VLCSW-200113** Units: **UG/L** Analysis Date: **13-Jan-2020 14:46**
Client ID: Run ID: **VOA6_354311** SeqNo: **5433240** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	38.36	2.0	40	0	95.9	64 - 133				
Carbon tetrachloride	19.52	1.0	20	0	97.6	72 - 136				
Chlorobenzene	20.57	1.0	20	0	103	82 - 118				
Chloroethane	20.68	1.0	20	0	103	60 - 138				
Chloroform	20.04	1.0	20	0	100	79 - 124				
Chloromethane	18.97	1.0	20	0	94.8	50 - 139				
cis-1,2-Dichloroethene	20.91	1.0	20	0	105	78 - 123				
cis-1,3-Dichloropropene	20.82	1.0	20	0	104	75 - 124				
Dibromochloromethane	21.73	1.0	20	0	109	74 - 126				
Dibromomethane	20.81	1.0	20	0	104	79 - 123				
Dichlorodifluoromethane	21.43	1.0	20	0	107	32 - 152				
Ethylbenzene	20.67	1.0	20	0	103	79 - 121				
Hexachlorobutadiene	19.09	1.0	20	0	95.5	66 - 134				
Isopropylbenzene	19.83	1.0	20	0	99.2	72 - 131				
m,p-Xylene	41.17	2.0	40	0	103	80 - 121				
Methylene chloride	19.92	2.0	20	0	99.6	74 - 124				
Naphthalene	19.43	1.0	20	0	97.2	61 - 128				
n-Butylbenzene	19.43	1.0	20	0	97.1	75 - 128				
n-Propylbenzene	20.32	1.0	20	0	102	76 - 126				
o-Xylene	20.3	1.0	20	0	102	78 - 122				
sec-Butylbenzene	19.75	1.0	20	0	98.8	77 - 126				
Styrene	20.76	1.0	20	0	104	78 - 123				
tert-Butylbenzene	20.3	1.0	20	0	102	78 - 124				
Tetrachloroethene	19.58	1.0	20	0	97.9	74 - 129				
Toluene	20.2	1.0	20	0	101	80 - 121				
trans-1,2-Dichloroethene	20.49	1.0	20	0	102	75 - 124				
trans-1,3-Dichloropropene	20.46	1.0	20	0	102	73 - 127				
Trichloroethene	20.61	1.0	20	0	103	79 - 123				
Trichlorofluoromethane	20.25	1.0	20	0	101	65 - 141				
Vinyl chloride	21.72	1.0	20	0	109	58 - 137				
Surr: 1,2-Dichloroethane-d4	*50.86*	*1.0*	*50*	*0*	*102*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*49.05*	*1.0*	*50*	*0*	*98.1*	*85 - 114*				
Surr: Dibromofluoromethane	*51.36*	*1.0*	*50*	*0*	*103*	*80 - 119*				
Surr: Toluene-d8	*46.08*	*1.0*	*50*	*0*	*92.2*	*89 - 112*				

ALS Houston, US Date: 20-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder: HS20010259

QC BATCH REPORT

Batch ID: R354311 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MS Sample ID: **HS20010458-01MS** Units: **UG/L** Analysis Date: **13-Jan-2020 17:10**
Client ID: Run ID: **VOA6_354311** SeqNo: **5433286** 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	21.15	1.0	20	0	106	78 - 124				
1,1,1-Trichloroethane	20.46	1.0	20	0	102	74 - 131				
1,1,2,2-Tetrachloroethane	19.36	1.0	20	0	96.8	71 - 121				
1,1,2-Trichloroethane	19.45	1.0	20	0	97.2	80 - 119				
1,1-Dichloroethane	18.88	1.0	20	0	94.4	77 - 125				
1,1-Dichloroethene	20.07	1.0	20	0	100	71 - 131				
1,1-Dichloropropene	20.1	1.0	20	0	101	78 - 125				
1,2,3-Trichlorobenzene	21.7	1.0	20	0	108	69 - 129				
1,2,3-Trichloropropane	19.19	1.0	20	0	95.9	73 - 122				
1,2,4-Trichlorobenzene	20.23	1.0	20	0	101	69 - 130				
1,2,4-Trimethylbenzene	21.96	1.0	20	0	110	76 - 124				
1,2-Dibromo-3-chloropropane	20.01	1.0	20	0	100	62 - 128				
1,2-Dibromoethane	20.07	1.0	20	0	100	77 - 121				
1,2-Dichlorobenzene	21.19	1.0	20	0	106	80 - 119				
1,2-Dichloroethane	20.37	1.0	20	0	102	73 - 128				
1,2-Dichloropropane	18.27	1.0	20	0	91.3	78 - 122				
1,3,5-Trimethylbenzene	22.42	1.0	20	0	112	75 - 124				
1,3-Dichlorobenzene	21.71	1.0	20	0	109	80 - 119				
1,3-Dichloropropane	18.93	1.0	20	0	94.6	80 - 119				
1,4-Dichlorobenzene	21.72	1.0	20	0	109	79 - 118				
2,2-Dichloropropane	19.38	1.0	20	0	96.9	60 - 139				
2-Butanone	31.36	2.0	40	0	78.4	56 - 143				
2-Chlorotoluene	22.41	1.0	20	0	112	79 - 122				
2-Hexanone	33.55	2.0	40	0	83.9	57 - 139				
4-Chlorotoluene	21.85	1.0	20	0	109	78 - 122				
4-Isopropyltoluene	22	1.0	20	0	110	77 - 127				
4-Methyl-2-pentanone	33.81	2.0	40	0	84.5	67 - 130				
Acetone	31.92	2.0	40	0	79.8	39 - 160				
Benzene	21.69	1.0	20	1.822	99.3	79 - 120				
Bromobenzene	22.22	1.0	20	0	111	80 - 120				
Bromochloromethane	19.32	1.0	20	0	96.6	78 - 123				
Bromodichloromethane	20.54	1.0	20	0	103	79 - 125				
Bromoform	20.35	1.0	20	0	102	66 - 130				
Bromomethane	14.14	1.0	20	0	70.7	53 - 141				

ALS Houston, US Date: 20-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder: HS20010259

QC BATCH REPORT

Batch ID: R354311 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MS Sample ID: **HS20010458-01MS** Units: **UG/L** Analysis Date: **13-Jan-2020 17:10**
Client ID: Run ID: **VOA6_354311** SeqNo: **5433286** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	38.67	2.0	40	0	96.7	64 - 133				
Carbon tetrachloride	21.01	1.0	20	0	105	72 - 136				
Chlorobenzene	20.45	1.0	20	0	102	82 - 118				
Chloroethane	20.54	1.0	20	0	103	60 - 138				
Chloroform	18.76	1.0	20	0	93.8	79 - 124				
Chloromethane	17.52	1.0	20	0	87.6	50 - 139				
cis-1,2-Dichloroethene	20.21	1.0	20	0	101	78 - 123				
cis-1,3-Dichloropropene	19.24	1.0	20	0	96.2	75 - 124				
Dibromochloromethane	20.41	1.0	20	0	102	74 - 126				
Dibromomethane	19.38	1.0	20	0	96.9	79 - 123				
Dichlorodifluoromethane	20.41	1.0	20	0	102	32 - 152				
Ethylbenzene	21.29	1.0	20	0	106	79 - 121				
Hexachlorobutadiene	18.79	1.0	20	0	94.0	66 - 134				
Isopropylbenzene	21.02	1.0	20	0	105	72 - 131				
m,p-Xylene	42.38	2.0	40	0.7455	104	80 - 121				
Methylene chloride	17.74	2.0	20	0	88.7	74 - 124				
Naphthalene	17.91	1.0	20	0	89.5	61 - 128				
n-Butylbenzene	21.82	1.0	20	0	109	75 - 128				
n-Propylbenzene	22.33	1.0	20	0	112	76 - 126				
o-Xylene	20.59	1.0	20	0	103	78 - 122				
sec-Butylbenzene	22.55	1.0	20	0	113	77 - 126				
Styrene	20.13	1.0	20	0	101	78 - 123				
tert-Butylbenzene	22.68	1.0	20	0	113	78 - 124				
Tetrachloroethene	21.47	1.0	20	0.6529	104	74 - 129				
Toluene	20.83	1.0	20	0	104	80 - 121				
trans-1,2-Dichloroethene	19.61	1.0	20	0	98.1	75 - 124				
trans-1,3-Dichloropropene	19.38	1.0	20	0	96.9	73 - 127				
Trichloroethene	21.1	1.0	20	0	105	79 - 123				
Trichlorofluoromethane	20.4	1.0	20	0	102	65 - 141				
Vinyl chloride	23.11	1.0	20	0.4051	114	58 - 137				
Surr: 1,2-Dichloroethane-d4	*47.08*	*1.0*	*50*	*0*	*94.2*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*47.99*	*1.0*	*50*	*0*	*96.0*	*85 - 114*				
Surr: Dibromofluoromethane	*48.42*	*1.0*	*50*	*0*	*96.8*	*80 - 119*				
Surr: Toluene-d8	*48.01*	*1.0*	*50*	*0*	*96.0*	*89 - 112*				

ALS Houston, US Date: 20-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder: HS20010259

QC BATCH REPORT

Batch ID: R354311 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MSD Sample ID: **HS20010458-01MSD** Units: **UG/L** Analysis Date: **13-Jan-2020 17:34**
Client ID: Run ID: **VOA6_354311** SeqNo: **5433287** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	20.35	1.0	20	0	102	78 - 124	21.15	3.86	20	
1,1,1-Trichloroethane	19.38	1.0	20	0	96.9	74 - 131	20.46	5.42	20	
1,1,2,2-Tetrachloroethane	19.05	1.0	20	0	95.3	71 - 121	19.36	1.6	20	
1,1,2-Trichloroethane	19.19	1.0	20	0	95.9	80 - 119	19.45	1.36	20	
1,1-Dichloroethane	17.72	1.0	20	0	88.6	77 - 125	18.88	6.34	20	
1,1-Dichloroethene	17.5	1.0	20	0	87.5	71 - 131	20.07	13.6	20	
1,1-Dichloropropene	19.13	1.0	20	0	95.6	78 - 125	20.1	4.97	20	
1,2,3-Trichlorobenzene	21.5	1.0	20	0	107	69 - 129	21.7	0.939	20	
1,2,3-Trichloropropane	19.41	1.0	20	0	97.0	73 - 122	19.19	1.13	20	
1,2,4-Trichlorobenzene	19.59	1.0	20	0	98.0	69 - 130	20.23	3.19	20	
1,2,4-Trimethylbenzene	21.41	1.0	20	0	107	76 - 124	21.96	2.57	20	
1,2-Dibromo-3-chloropropane	18.81	1.0	20	0	94.1	62 - 128	20.01	6.18	20	
1,2-Dibromoethane	20.03	1.0	20	0	100	77 - 121	20.07	0.18	20	
1,2-Dichlorobenzene	21.08	1.0	20	0	105	80 - 119	21.19	0.519	20	
1,2-Dichloroethane	20.06	1.0	20	0	100	73 - 128	20.37	1.52	20	
1,2-Dichloropropane	18.03	1.0	20	0	90.2	78 - 122	18.27	1.3	20	
1,3,5-Trimethylbenzene	21.63	1.0	20	0	108	75 - 124	22.42	3.59	20	
1,3-Dichlorobenzene	21.27	1.0	20	0	106	80 - 119	21.71	2.04	20	
1,3-Dichloropropane	19.23	1.0	20	0	96.1	80 - 119	18.93	1.56	20	
1,4-Dichlorobenzene	21.11	1.0	20	0	106	79 - 118	21.72	2.85	20	
2,2-Dichloropropane	18.19	1.0	20	0	91.0	60 - 139	19.38	6.33	20	
2-Butanone	30.48	2.0	40	0	76.2	56 - 143	31.36	2.83	20	
2-Chlorotoluene	21.84	1.0	20	0	109	79 - 122	22.41	2.55	20	
2-Hexanone	33.94	2.0	40	0	84.8	57 - 139	33.55	1.15	20	
4-Chlorotoluene	21.01	1.0	20	0	105	78 - 122	21.85	3.91	20	
4-Isopropyltoluene	21.98	1.0	20	0	110	77 - 127	22	0.125	20	
4-Methyl-2-pentanone	34.34	2.0	40	0	85.9	67 - 130	33.81	1.56	20	
Acetone	26.72	2.0	40	0	66.8	39 - 160	31.92	17.7	20	
Benzene	20.64	1.0	20	1.822	94.1	79 - 120	21.69	4.94	20	
Bromobenzene	21.57	1.0	20	0	108	80 - 120	22.22	2.97	20	
Bromochloromethane	18.6	1.0	20	0	93.0	78 - 123	19.32	3.77	20	
Bromodichloromethane	19.51	1.0	20	0	97.6	79 - 125	20.54	5.1	20	
Bromoform	20.45	1.0	20	0	102	66 - 130	20.35	0.482	20	
Bromomethane	13.78	1.0	20	0	68.9	53 - 141	14.14	2.59	20	

ALS Houston, US Date: 20-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder: HS20010259

QC BATCH REPORT

Batch ID: R354311 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MSD Sample ID: **HS20010458-01MSD** Units: **UG/L** Analysis Date: **13-Jan-2020 17:34**
Client ID: Run ID: **VOA6_354311** SeqNo: **5433287** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Carbon disulfide	36.05	2.0	40	0	90.1	64 - 133	38.67	7.02	20	
Carbon tetrachloride	20.23	1.0	20	0	101	72 - 136	21.01	3.75	20	
Chlorobenzene	20.1	1.0	20	0	101	82 - 118	20.45	1.74	20	
Chloroethane	19.12	1.0	20	0	95.6	60 - 138	20.54	7.16	20	
Chloroform	17.83	1.0	20	0	89.1	79 - 124	18.76	5.07	20	
Chloromethane	16.91	1.0	20	0	84.5	50 - 139	17.52	3.57	20	
cis-1,2-Dichloroethene	19.44	1.0	20	0	97.2	78 - 123	20.21	3.87	20	
cis-1,3-Dichloropropene	18.58	1.0	20	0	92.9	75 - 124	19.24	3.5	20	
Dibromochloromethane	20.55	1.0	20	0	103	74 - 126	20.41	0.662	20	
Dibromomethane	19.25	1.0	20	0	96.2	79 - 123	19.38	0.66	20	
Dichlorodifluoromethane	19.25	1.0	20	0	96.2	32 - 152	20.41	5.83	20	
Ethylbenzene	20.7	1.0	20	0	104	79 - 121	21.29	2.81	20	
Hexachlorobutadiene	17.46	1.0	20	0	87.3	66 - 134	18.79	7.36	20	
Isopropylbenzene	20.56	1.0	20	0	103	72 - 131	21.02	2.22	20	
m,p-Xylene	41.65	2.0	40	0.7455	102	80 - 121	42.38	1.72	20	
Methylene chloride	17.21	2.0	20	0	86.0	74 - 124	17.74	3.06	20	
Naphthalene	18.48	1.0	20	0	92.4	61 - 128	17.91	3.18	20	
n-Butylbenzene	21.28	1.0	20	0	106	75 - 128	21.82	2.48	20	
n-Propylbenzene	21.74	1.0	20	0	109	76 - 126	22.33	2.67	20	
o-Xylene	20.54	1.0	20	0	103	78 - 122	20.59	0.253	20	
sec-Butylbenzene	22.27	1.0	20	0	111	77 - 126	22.55	1.27	20	
Styrene	20.09	1.0	20	0	100	78 - 123	20.13	0.209	20	
tert-Butylbenzene	22.22	1.0	20	0	111	78 - 124	22.68	2.04	20	
Tetrachloroethene	21.06	1.0	20	0.6529	102	74 - 129	21.47	1.93	20	
Toluene	20.56	1.0	20	0	103	80 - 121	20.83	1.31	20	
trans-1,2-Dichloroethene	18.6	1.0	20	0	93.0	75 - 124	19.61	5.3	20	
trans-1,3-Dichloropropene	19.03	1.0	20	0	95.1	73 - 127	19.38	1.86	20	
Trichloroethene	20.11	1.0	20	0	101	79 - 123	21.1	4.79	20	
Trichlorofluoromethane	20.02	1.0	20	0	100	65 - 141	20.4	1.88	20	
Vinyl chloride	21.5	1.0	20	0.4051	105	58 - 137	23.11	7.23	20	
Surr: 1,2-Dichloroethane-d4	*47.13*	*1.0*	*50*	*0*	*94.3*	*81 - 118*	*47.08*	*0.11*	*20*	
Surr: 4-Bromofluorobenzene	*49.38*	*1.0*	*50*	*0*	*98.8*	*85 - 114*	*47.99*	*2.86*	*20*	
Surr: Dibromofluoromethane	*47.87*	*1.0*	*50*	*0*	*95.7*	*80 - 119*	*48.42*	*1.15*	*20*	
Surr: Toluene-d8	*48.53*	*1.0*	*50*	*0*	*97.1*	*89 - 112*	*48.01*	*1.09*	*20*	

ALS Houston, US Date: 20-Jan-20

Client:	Bhate Environmental Associates, Inc.
Project:	Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder:	HS20010259

QC BATCH REPORT

Batch ID:	**R354311 (0)**	**Instrument:**	**VOA6**	**Method:**	**VOLATILES ORGANICS BY METHOD 8260C**

The following samples were analyzed in this batch: HS20010259-01 HS20010259-03

ALS Houston, US Date: 20-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder: HS20010259

QC BATCH REPORT

Batch ID: R354071 (0) **Instrument: UV-2450** **Method: HEXAVALENT CHROMIUM BY SW7196A**

MBLK Sample ID: **MBLK-354071** Units: **mg/L** Analysis Date: **08-Jan-2020 13:41**
Client ID: Run ID: **UV-2450_354071** SeqNo: **5429217** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chromium, Hexavalent	0.0100	0.0100								U

LCS Sample ID: **LCS-354071** Units: **mg/L** Analysis Date: **08-Jan-2020 13:41**
Client ID: Run ID: **UV-2450_354071** SeqNo: **5429218** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chromium, Hexavalent	0.252	0.0100	0.25	0	101	90 - 111				

MS Sample ID: **HS20010258-01MS** Units: **mg/L** Analysis Date: **08-Jan-2020 13:41**
Client ID: Run ID: **UV-2450_354071** SeqNo: **5429219** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chromium, Hexavalent	0.254	0.0100	0.25	0.001	101	90 - 111				

MSD Sample ID: **HS20010258-01MSD** Units: **mg/L** Analysis Date: **08-Jan-2020 13:41**
Client ID: Run ID: **UV-2450_354071** SeqNo: **5429220** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chromium, Hexavalent	0.239	0.0100	0.25	0.001	95.2	90 - 111	0.254	6.09	20	

The following samples were analyzed in this batch: HS20010259-01

ALS Houston, US Date: 20-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder: **HS20010259**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

ALS Houston, US Date: 20-Jan-20

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	T104704231-19-25	30-Apr-2020

ALS Houston, US Date: 20-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Monthly Effluent Samples
Work Order: HS20010259

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS20010259-01	LH18/24-SP650_010720	Login	1/8/2020 11:02:52 AM	PMG	EXT015
HS20010259-01	LH18/24-SP650_010720	Login	1/8/2020 11:02:52 AM	PMG	WET116
HS20010259-01	LH18/24-SP650_010720	Login	1/8/2020 11:02:52 AM	PMG	MET081
HS20010259-01	LH18/24-SP650_010720	Login	1/8/2020 11:02:52 AM	PMG	VOA085
HS20010259-02	LH18/24-SP650_010720_BIX	Login	1/8/2020 11:02:52 AM	PMG	Sub
HS20010259-03	Trip Blank	Login	1/8/2020 11:02:52 AM	PMG	VOA085

00968650

ALS Houston, US Date: 20-Jan-20

Sample Receipt Checklist

Client Name: Bhate Environmental
Work Order: HS20010259
Date/Time Received: **08-Jan-2020 08:58**
Received by: **PMG**

Checklist completed by: *Paresh M. Giga* eSignature 8-Jan-2020 Date
Reviewed by: *RJ Modashia* eSignature 8-Jan-2020 Date

Matrices: **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):	0.6c U/C	IR25
Cooler(s)/Kit(s):	42584	
Date/Time sample(s) sent to storage:	1/7/2020 11:15	

Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

00968651

CHAIN OF CUSTODY

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

Page 1 of 1

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

Project No. NWO1312.0150.0 16.0001

Job:
GROUNDWATER TREATMENT PLANT MONTHLY EFFLUENT SAMPLES

Prepared By: Scott Beesinger

P.O. Number

HS20010259
Bhate Environmental Associates, Inc.
Longhorn GW Treatment Plant Monthly Effluent Sample

Field Sample I.D.	Sample Matrix	Date / Time	MS / MSD	No. OF CONTAINERS	VOLATILES	SILVER, SELENIUM, LEAD, BARIUM	HEXAVALENT CHROMIUM	1, 4 - DIOXANE	PERCHLORATE						Remarks (Preservatives, etc.)	Lab I.D.#
LH18/24-SP650_010720	Water	01/07/20 / 14:00		3	X										HCL	
LH18/24-SP650_010720	Water	01/07/20 / 14:00		2			X	X							NONE	
LH18/24-SP650_010720_BIX	Water	01/07/20 / 14:00		1					X						NONE	
LH18/24-SP650_010720	Water	01/07/20 / 14:00		1		X									HNO3	
Trip Blank	Water	01/07/20		2	X										HCL	

Additional Remarks: **24 HR TAT on VOC's. Standard TAT on all other parameters**

Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
Scott Beesinger	01/07/20	14:30	[signature]	1/8/20	08:58						

For Lab Use Only

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

Remarks:

42584 VIC. 0.6° #25 C/F 0.0°

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

00968652

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

42,34

Date: 11
Name: S
Company:

CUSTODY SEAL
7/20 Time: 1430
Scott Beesinger
Bhate

Seal Broken By:
Date: 1/8/20

Must Deliver Next Business Day
Time and Tempature Sensitive!

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
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) 530-5656
REF: LHAAP-18/24-BO 68900-RJ

RMA:

FedEx Express

E

RETURNS MON-SAT

FedEx
TRK# 0221 1251 0292 4130

WED - 08 JAN 10:30A
PRIORITY OVERNIGHT

AB SGRA

77099
TX-US
IAH

FID 162785 07JAN20 GGGA 56AC2/DF82/05A2

Case Narrative

Method: 6850
Analysis: Perchlorate
Analysis SOP: LC-MS-CLO4
ALS WO ID(s): 2000307; 2000949; 2000952; 2000953

Client: ALS Laboratories (Houston, TX)
Matrix: Water
ELMS Batch (HBN): 2340 (255305)

General Set Information: There were four 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. 50µL 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 0.45µm Syringe filters.

Holding Times: Holding times were met for all analyses.

Dilutions: Field sample 2000952001 was analyzed and reported from a 1:1,000 dilution. The reporting limit has been adjusted accordingly.

Method QC data: The method blank (LMB 691930) was less than 1/2 the CRDL. The recovery for the LCS (692062) was within acceptable parameters.

MS/MSD Analysis: MS/MSD was performed on sample 2000307001 (Client ID: LH24-SP650_1230.19_BIX). 3.0µL of Working Standard Solution Horizon ID 49947 was added to 10.0mL of sample preparation. The spike target was 3.µg/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 µg/L. Results were calculated in µg/L by the equation (A)x(B),

where: A = Analyte concentration from the standard curve (µg/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 – 691929) is reported from the analysis of the Laboratory Control Sample (LCS – 692062) at a level of 3.0µg/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 15, 2020
Analyst Date

ANALYTICAL REPORT

Report Date: January 15, 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: **34-2000953**
Project ID: HS20010259
Purchase Order: HS20010259-02
Project Manager Kevin W. Griffiths

Client Sample ID	Lab ID	Collect Date	Receive Date	Sampling Site
LH18/24-SP650_010720_BIX Water	2000953001	01/07/20	01/09/20	HS20010259-02

ANALYTICAL REPORT

Workorder: 34-2000953
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: **LH18/24-SP650_010720_BIX Water**
Lab ID: 2000953001
Matrix: Water
Sampling Site: HS20010259-02
Media: 125 mL Nalgene
Sampling Parameter: NA
Collected: 01/07/2020
Received: 01/09/2020

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water
Batch: ELMS/2340 (HBN: 255305)
Analyzed: 01/15/2020 11:18
Instrument ID: LCMS04
%Solids: NA
Report Basis: Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	2.0	1.0	2.0	4.0	1	J

Comments

Quality Control: **EPA 6850, DoD QSM - (HBN: 255305)**

Field sample 2000952001 was analyzed and reported from a 1:1,000 dilution. The reporting limit has 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 01/15/2020 13:34	/S/ Stephen Brose 01/15/2020 14:31

Laboratory Contact Information

ALS Environmental
960 W Levoy Drive
Salt Lake City, Utah 84123

Phone: (801) 266-7700
Email: alslt.lab@ALSGlobal.com
Web: www.alsslc.com

ANALYTICAL REPORT

Workorder: 34-2000953
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

Analysis Information

Workorder: 2000953

Limits:	Client SOW/Contract Specified	**Preparation:**	NA	**Analysis:**	EPA 6850, DoD QSM
Basis:	DoD QSM	**Batch:**	NA	**Batch:**	ELMS/2340 (HBN: 255305)
		Prepared By:	NA	**Analyzed By:**	Thomas Bosch

Blank

LMB: 691930
Analyzed: 01/15/2020 09:54
Units: ug/L

Analyte	Result	MDL	RL
Perchlorate	ND	1	2.00

Laboratory Control Sample

LCS: 692062
Analyzed: 01/15/2020 09:26
Dilution: 1
Units: ug/L

Analyte	Result	Target	% Rec	QC Limits	
Perchlorate	3.29	3.00	110	78.8	123.8

Matrix Spike - Matrix Spike Duplicate

Sample:	2000307001	**MS:**	691932	**MSD:**	691933
Analyzed:	01/15/2020 10:08	**Analyzed:**	01/15/2020 10:22	**Analyzed:**	01/15/2020 10:36
Dilution:	1	**Dilution:**	1	**Dilution:**	1
Units:	ug/L	**Units:**	ug/L	**Units:**	ug/L

Analyte	Result	Result	Target	% Rec	QC Limits		Result	% Rec	RPD	QC Limits	
Perchlorate	ND	3.2	3	107	78.8	123.8	3.46	115	7.86	0.0	20.0

Comments

Field sample 2000952001 was analyzed and reported from a 1:1,000 dilution. The reporting limit has been adjusted accordingly.

QC Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Analyst	Peer Review
/S/ Thomas Bosch	/S/ Stephen Brose
01/15/2020 13:39	01/15/2020 14:31

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

2000953



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/#7

SAMPLING STATE: **Dept of Defense** **COC ID:** **13051**

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:	
Email:	

INVOICE INFORMATION:

Company:	ALS Houston
Contact:	Accounts Payable
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Reference:	HS20010259
TSR:	Danielle Winnings

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS20010259-02**	**LH18/24-SP650_010720_BIX**	**Water**	**07 Jan 2020 14:00**
	SUB_Perch-6850			16 Jan 2020

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. Murphy Date/Time: 01/08/20 18:00

Received By: Date/Time: 1/9/20 0912B

Cooler ID(s): Temperature(s):

00968660

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: 1/9/20 09:28

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:	Cntnr/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		
	Frozen/Melted/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	Great	4 °C	4		°C	7		°C
2		°C	5		°C	8		°C
3		°C	6		°C	9		°C

Taken By: Jaylynn B. (Signature) Jaylynn Brittain (Printed Name) 1/9/20 (Date)

CLIENT-RELATED INFORMATION

☐ Missing Cooler	☐ Missing Samples/Bottles	☐ Incorrect Preservation	☐ Insufficient Sample Volume
☐ Cooler Conditions	☐ Broken/Leaking Samples	☐ pH Criteria Not Met	☐ Chain of Custody Problems
☐ Missing Paperwork	☐ Incorrect Bottle Type	☐ Residual Chlorine Present	☐ Other:
☐ Missing/Incorrect Bottle Labels	☐ Cooler Temperatures Out of Range	☐ 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: _____ (Printed Name) Returned to Sample Receipt by: _____ (Signature) Date: _____

00968661



ORIGIN ID:SGRA (281) 530-5656
SHIPPING DEPT
ALS LABORATORY GROUP
10450 STANCLIFF RD
SUITE 210
HOUSTON, TX 77099
UNITED STATES US

SHIP DATE: 08JAN20
ACTWGT: 9.85 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) 266-7700
REF: HS20010258/259/261 RJ

FedEx Express

THU - 09 JAN 3:00P
STANDARD OVERNIGHT

TRK# 0201 1251 0293 5192

AX BTFA

84123
UT-US SLC

ALS Environmental
CHAIN-OF-CUSTODY

Project / Job / Task: HS20010259-02	***Split:***	**Workorder ID:** 2000953	**Level:** ENV_LVL4	**Requested Analysis**
Client: ALS Environmental (Houston)		**Account:** 8101	**Type:** 125Poly	
Comments:			**Preservatives** COOL	EPA 6850, DoD QSM

Item	Collect Date/Time	Sample ID	Lab ID	QC	Matrix	Containers ID(s)	Containers Count	Requested Analysis
1	01/07/2020 14:00	LH18/24-SP650_010720_BIX Water	2000953001		Water	A	1	A

ORIGINAL FIELD SAMPLE CHAIN-OF-CUSTODY

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location
VanTassell, Tami	01/09/2020 09:28	ALS Sample Receiving	Sample Login
Tami VanTassell R.33.1	01-09-20 18:35	ISC	Storage
	01-13-20/08:35	T. Bosch	Clay analysis

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

Batch Worklist

Batch: ELMS/ 2340
Rule: EPA 6850, DoD QSM Water

Created: 1/14/2020 15:38
Analyst: T. Bosch

Instrument: LCMS04
Status: WP

HBN: 255305

Workorder: 2000307 [ENV_LVL4]
Workorder: 2000949 [ENV_LVL4]
Workorder: 2000952 [ENV_LVL4]
Workorder: 2000953 [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	691928	CCV for HBN 255305 [ELMS/2340]				CCV	3		E685041C3Q	5311		1/16/2020	1/15/2020
2	691929	RLVS for HBN 255305 [ELMS/2340				RLVS	3		E685041C3Q	5311		1/16/2020	1/15/2020
3	692062	LCS for HBN 255305 [ELMS/2340]				LCS	3		E6850Q413Q	5311		1/16/2020	
4	691973	ICS for HBN 255305 [ELMS/2340]				ICS	3		E6850..D3Q	5311		1/16/2020	1/15/2020
5	691930	LMB for HBN 255305 [ELMS/2340]				LMB	3		E6850Q413Q	5311		1/16/2020	1/15/2020
6	2000307001	LH18/24-SP650_1230.19_BIX				SAMPLE	3	2000307001-A	E6850Q41.3	5480	1/27/2020	1/16/2020	1/15/2020
7	691932	LH18/24-SP650...(2000307001MS)				MS	3		E6850Q413Q	5311		1/16/2020	1/15/2020
8	691933	LH18/24-SP65...(2000307001MSD)				MSD	3		E6850Q413Q	5311		1/16/2020	1/15/2020
9	2000949001	LH18/24-SP650_010720_BIX Water				SAMPLE	3	2000949001-A	E6850Q41.3	5480	2/4/2020	1/22/2020	1/15/2020
10	2000952001	LH18/24-SP140_010720				SAMPLE	3	2000952001-A	E6850Q41.3	5480	2/4/2020	1/23/2020	1/15/2020
11	2000953001	LH18/24-SP650_010720_BIX Water				SAMPLE	3	2000953001-A	E6850Q41.3	5480	2/4/2020	1/22/2020	1/15/2020
12	691934	CCV for HBN 255305 [ELMS/2340]				CCV	3		E685041C3Q	5311		1/16/2020	1/15/2020



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Analytical Documentation

Analyst Write-up

ALS Work Order #'s & Sample #( )'s: 2000307 (001); 2000949 (001); 2000952 (001); 2000953 (001)
ELMS Batch/HBN ID: 2336 (254688)
Prep Date: 01/13/2020 Analysis Date: 01/15/2020 Analyst: Tom Bosch
Analyte: **Perchlorate** Matrix: **Water** Method: **6850**
Sequence: \\HPCHEM\1\SEQUENCE\CLO4\2020\JAN\15JAN20D.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 692092; Target = 3.0µg/L. ASTM type II water was used for LMB 691930.

MS/MSD: The Matrix Spike and duplicate (MS/MSD) was performed on sample 2000307001 (Client ID: LH24-SP650_1230.19_BIX). 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 2000952001 was analyzed and reported from a 1:1,000 dilution. The reporting limit has 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\2020\JAN\HBN# or through NuGenesis\Tree\PrintData\LCMS\DefaultView.
4) Notebook: \\alsltws013\ORGANIC\BOSCH\LCMS\Perchlorates\Waters\2020\DOD\255305-DoD-ALS-Hstn LCMS4 or through \\ALSLTWS013\DATAREVIEW\HBN#
5) The Reporting Limit Verification Standard (RLVS – 691929) is reported from the analysis of the Laboratory Control Sample (LCS – 692062) 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 **Batch(es)/SDG:** ELMS: 2340 HBN: 255305 **Sample Set IDs if Applicable:** 2000307/2000949/2000952/2000953	**Analyst Initials**	**Reviewer Initials**
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
MFG: AccuStandard
MFG Lot: 218065075
Part ID: IC-PER-10X-1

Created By: Thomas Bosch
Create Date: 09/17/2018 09:09AM

Amount: 100 mL
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
MFG: ALS/SLC
MFG Lot: TNB: 09/20/2019
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 09/23/2019 03:09PM

Amount: 10 mL
Expires: 07/25/2020
Usable: Yes
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**
MFG: ALS/SLC
MFG Lot: TNB: 05/06/2019
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 05/06/2019 03:05PM

Amount: 10 mL
Expires: 03/31/2020
Usable: Yes
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 43659

AccuTrace™ Reference Standard

Catalog No: IC-PER-10X-1
Description: Perchlorate Standard
Element: Perchlorate (ClO_4)
SRM: Ind. Std.
Lot: 218065075
Matrix: Water
Hazards: *Refer to SDS for complete safety information*

Signal Word: None

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

Component		SRM #	Prepared Concentration (µg/mL)
ClO_4	Perchlorate	Ind. Std.	1000

AccuStandard

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

For use in routine laboratory analysis.

AccuStandard is accredited to ISO 17034, ISO/IEC 17025 and certified to ISO 9001:2015

ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

TRIPLE ISO CERTIFICATION ULTRA ISO 9001 ISO GUIDE 34 ISO 17025

ISO Guide 34 Reference Material

Product Number: ICC-013
Lot Number: CP-0860

S 36748

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.

ANAB ACCREDITED ISO GUIDE 34 REFERENCE MATERIAL PRODUCER

ANAB ACCREDITED ISO/IEC 17025 TESTING LABORATORY

ISO 9001 Registered Quality System – TUV USA

ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

TRIPLE ISO CERTIFICATION ULTRA ISO 9001 ISO GUIDE 34 ISO 17025

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

ANAB ACCREDITED ACCREDITATION REFERENCE MATERIAL PRODUCER

ANAB ACCREDITED ACCREDITATION TESTING LABORATORY

Cambridge Isotope Laboratories, Inc.

Certificate of Analysis

S 47863

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:	≥ 98%
MW*: * For isotopically labeled compounds, MW listed is for the fully enriched product.	130.44
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.

$NaCl^{18}O_4$

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 ± 1.0 µg/mL (k=2)
Chemical Purity of Neat Material(s)	98%
LC/MS for Concentration	105.4 ± 1.1 µg/mL (k=2)



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

00968682

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
	*	691928 CCV@25	Vial 71	1	Control	1	1.72889e6	7.434	23.42373
	*	691929 RLVS@3.	Vial 72	1	Control	2	2.18673e5	7.137	3.28544
	*	691973 ICS@3.0	Vial 73	1	Control	3	1.35107e5	7.223	2.74699
	*	691930 LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
	*	2000307001	Vial 75	1	Sample	5	0.00000	0.000	0.00000
	*	691932 03071MS	Vial 76	1	Sample	6	2.05477e5	7.225	3.19824
	*	691933 03071SD	Vial 77	1	Sample	7	2.03421e5	7.166	3.45981
	*	2000949001	Vial 78	1	Sample	8	1.28802e5	7.167	1.95055
	*	2000952001 1K	Vial 79	1	Sample	9	9.69192e5	7.467	1.33675e4
	*	2000953001	Vial 80	1	Sample	10	1.27924e5	7.209	1.98446
	*	691934 CCV@25	Vial 71	1	Control	11	1.75169e6	7.513	23.40547

#	*	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
	*	691928 CCV@25	Vial 71	1	Control	1	2.53846e5	7.458	5.00000
	*	691929 RLVS@3.	Vial 72	1	Control	2	2.45151e5	7.155	5.00000
	*	691973 ICS@3.0	Vial 73	1	Control	3	1.80729e5	7.237	5.00000
	*	691930 LMB	Vial 74	1	Control	4	2.29509e5	7.359	5.00000
	*	2000307001	Vial 75	1	Sample	5	2.52311e5	7.208	5.00000
	*	691932 03071MS	Vial 76	1	Sample	6	2.36573e5	7.234	5.00000
	*	691933 03071SD	Vial 77	1	Sample	7	2.16655e5	7.188	5.00000
	*	2000949001	Vial 78	1	Sample	8	2.40635e5	7.188	5.00000
	*	2000952001 1K	Vial 79	1	Sample	9	2.59889e5	7.488	5000.00000
	*	2000953001	Vial 80	1	Sample	10	2.35040e5	7.233	5.00000
	*	691934 CCV@25	Vial 71	1	Control	11	2.57415e5	7.543	5.00000

#	*	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
	*	691928 CCV@25	Vial 71	1	Control	1	5.16114e5	7.454	22.95643
	*	691929 RLVS@3.	Vial 72	1	Control	2	7.08840e4	7.153	3.40228
	*	691973 ICS@3.0	Vial 73	1	Control	3	4.90107e4	7.237	3.18375
	*	691930 LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
	*	2000307001	Vial 75	1	Sample	5	0.00000	0.000	0.00000
	*	691932 03071MS	Vial 76	1	Sample	6	7.10460e4	7.230	3.53797
	*	691933 03071SD	Vial 77	1	Sample	7	7.17154e4	7.182	3.91012
	*	2000949001	Vial 78	1	Sample	8	4.39331e4	7.199	2.09952
	*	2000952001 1K	Vial 79	1	Sample	9	2.85347e5	7.486	1.28498e4
	*	2000953001	Vial 80	1	Sample	10	4.63748e4	7.229	2.28052
	*	691934 CCV@25	Vial 71	1	Control	11	5.25077e5	7.533	23.02547

*** End of Report ***

Sequence Table:

Method and Injection Info Part:

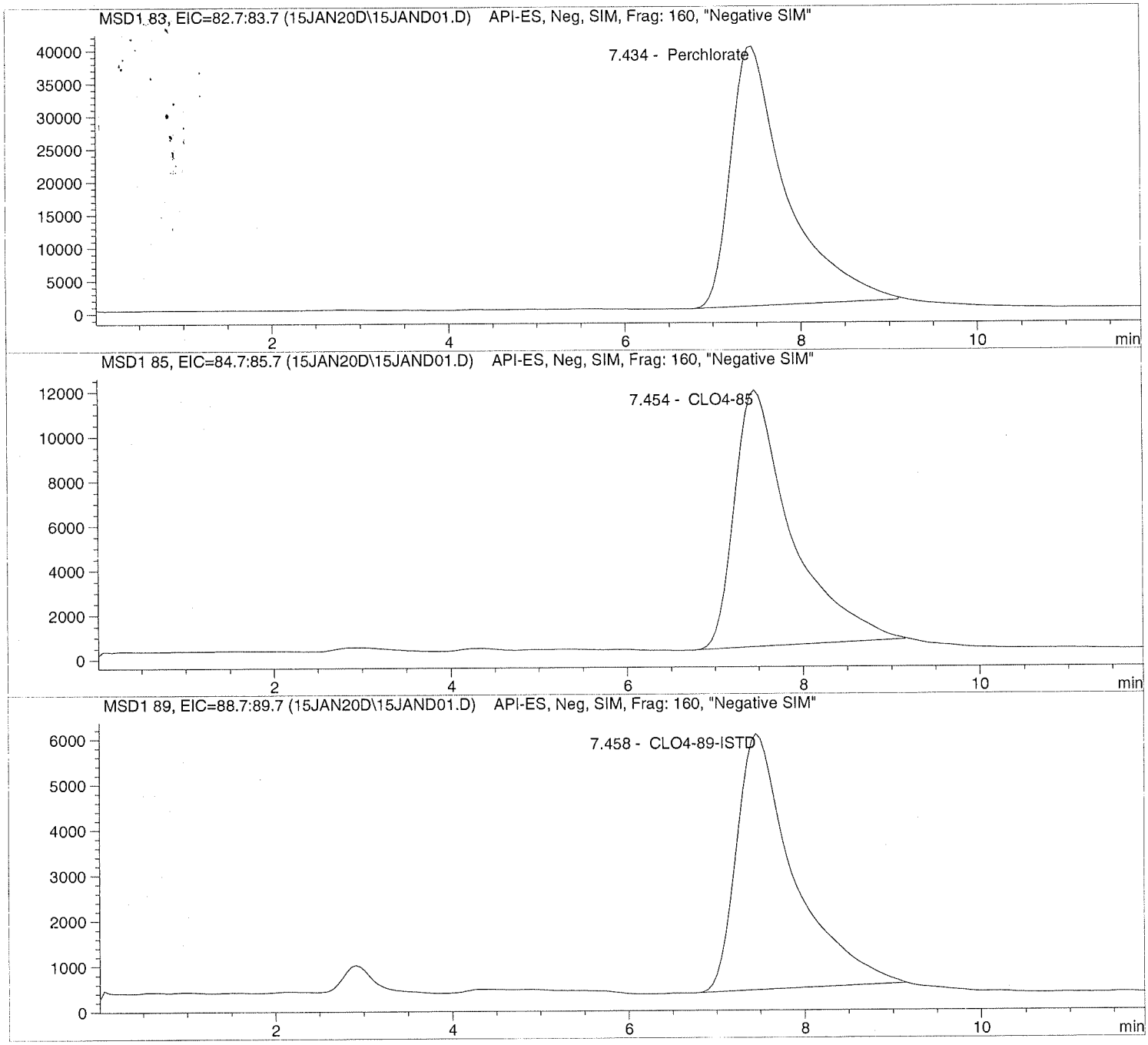
Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
1	Vial 71	691928 CCV@25	CLO4-AQN	1	Ctrl Samp		
2	Vial 72	691929 RLVS@3.	CLO4-AQN	1	Ctrl Samp		
3	Vial 73	691973 ICS@3.0	CLO4-AQN	1	Ctrl Samp		
4	Vial 74	691930 LMB	CLO4-AQN	1	Ctrl Samp		
5	Vial 75	2000307001	CLO4-AQN	1	Sample		
6	Vial 76	691932 03071MS	CLO4-AQN	1	Sample		
7	Vial 77	691933 03071SD	CLO4-AQN	1	Sample		
8	Vial 78	2000949001	CLO4-AQN	1	Sample		
9	Vial 79	2000952001 1K	CLO4-AQN	1	Sample		
10	Vial 80	2000953001	CLO4-AQN	1	Sample		
11	Vial 71	691934 CCV@25	CLO4-AQN	1	Ctrl Samp		

Data file: C:\HPCHEM\1\DATA\15JAN20D\15JAND01.D Sample Name: 691928 CCV@25

Injection Date:	1/15/2020 09:13:04	Seq Line:	1
Sample Name:	691928 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\15JAN20D\15JAND01.D Sample Name: 691928 CCV@25

Injection Date:	1/15/2020 09:13:04	Seq Line:	1
Sample Name:	691928 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
7.434	PBA	1728889.5	23.4237	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.454	PBA	516113.6	22.9564	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.458	PBA	253846.5	5.0000	CLO4-89-ISTD

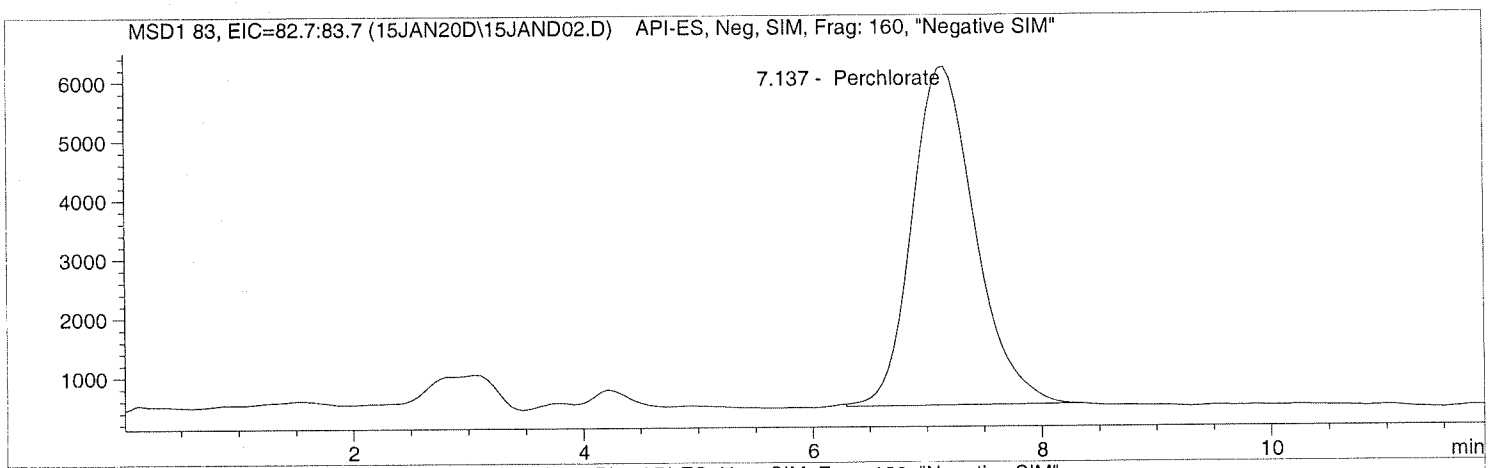
*** End of Report ***

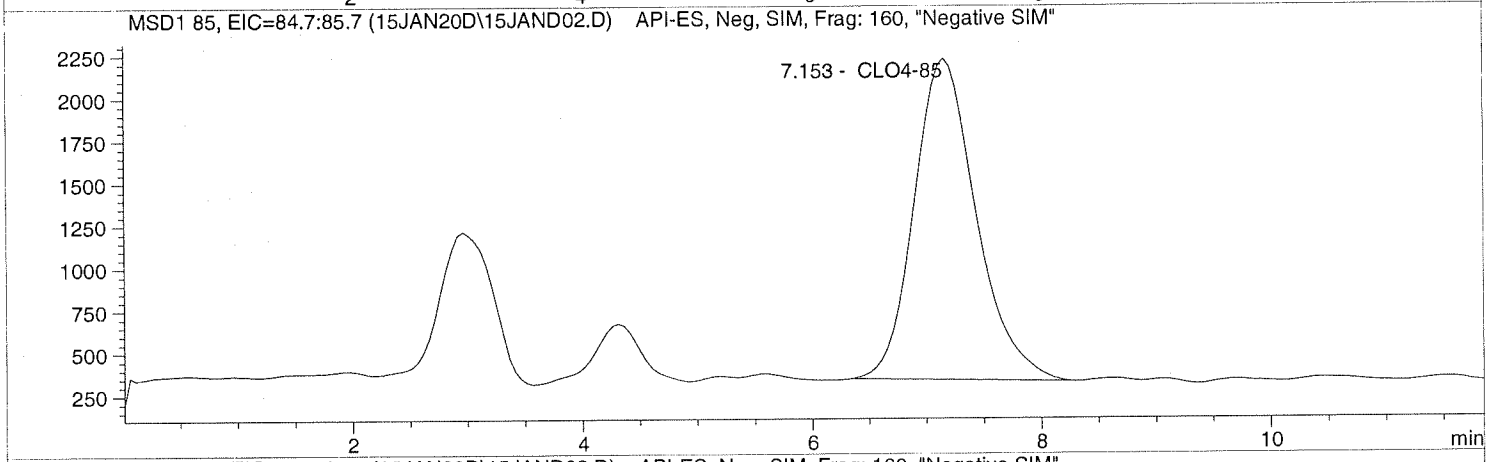
Data file: C:\HPCHEM\1\DATA\15JAN20D\15JAND02.D Sample Name: 691929 RLVS@3.

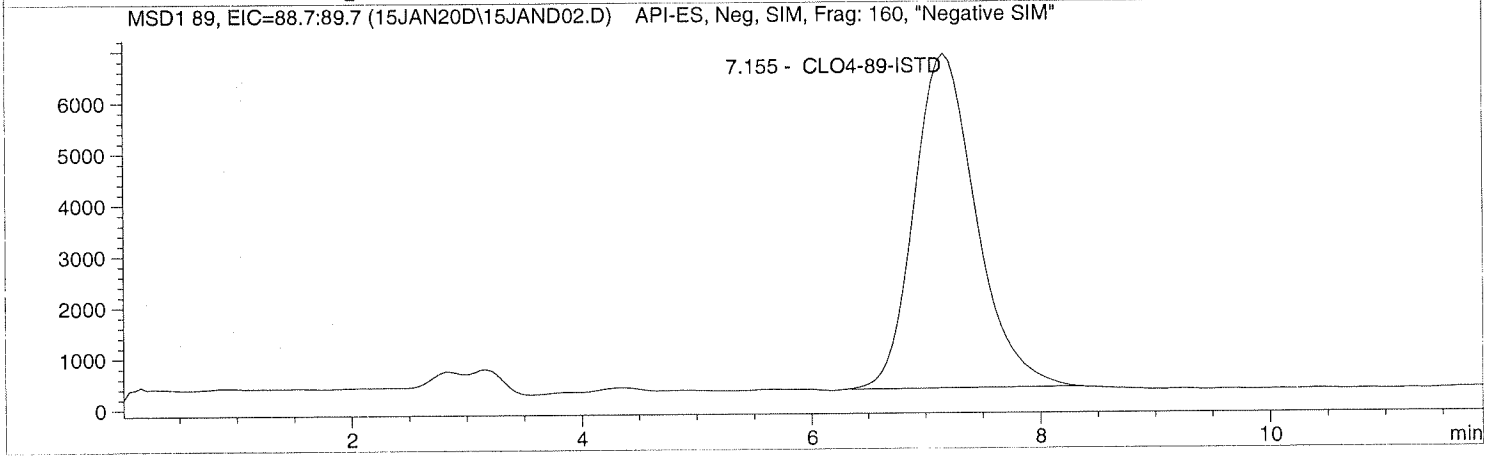
Injection Date:	1/15/2020 09:26:54	Seq Line:	2
Sample Name:	691929 RLVS@3.	Location:	Vial 72
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

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\15JAN20D\15JAND02.D Sample Name: 691929 RLVS@3.

Injection Date:	1/15/2020 09:26:54	Seq Line:	2
Sample Name:	691929 RLVS@3.	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
7.137	BBA	218673.2	3.2854	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.153	BBA	70884.0	3.4023	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.155	PBA	245151.2	5.0000	CLO4-89-ISTD

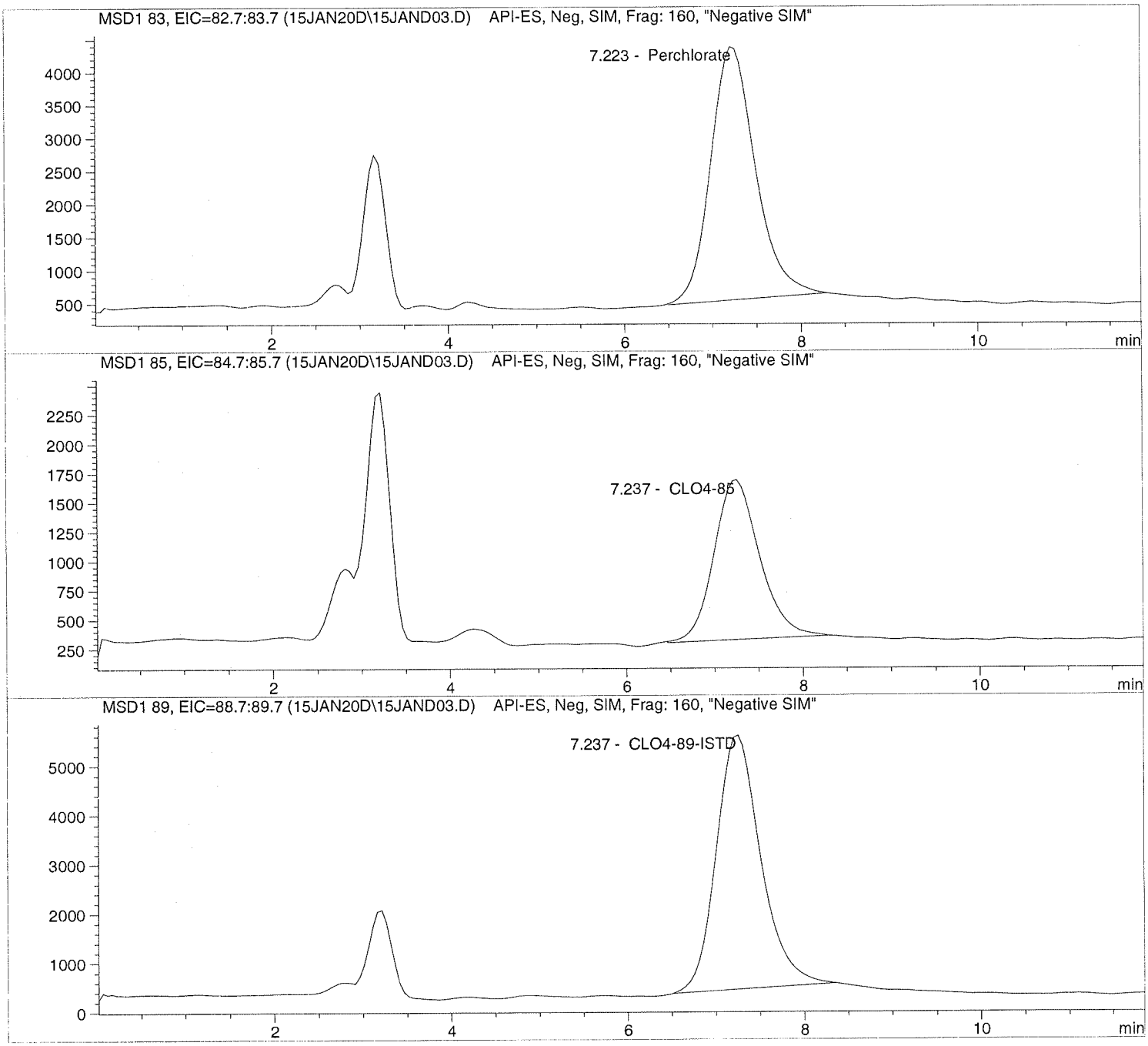
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\15JAN20D\15JAND03.D Sample Name: 691973 ICS@3.0

Injection Date:	1/15/2020 09:40:49	Seq Line:	3
Sample Name:	691973 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\15JAN20D\15JAND03.D Sample Name: 691973 ICS@3.0

Injection Date:	1/15/2020 09:40:49	Seq Line:	3
Sample Name:	691973 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
7.223	PBA	135106.7	2.7470	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.237	BBA	49010.7	3.1837	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.237	PBA	180729.3	5.0000	CLO4-89-ISTD

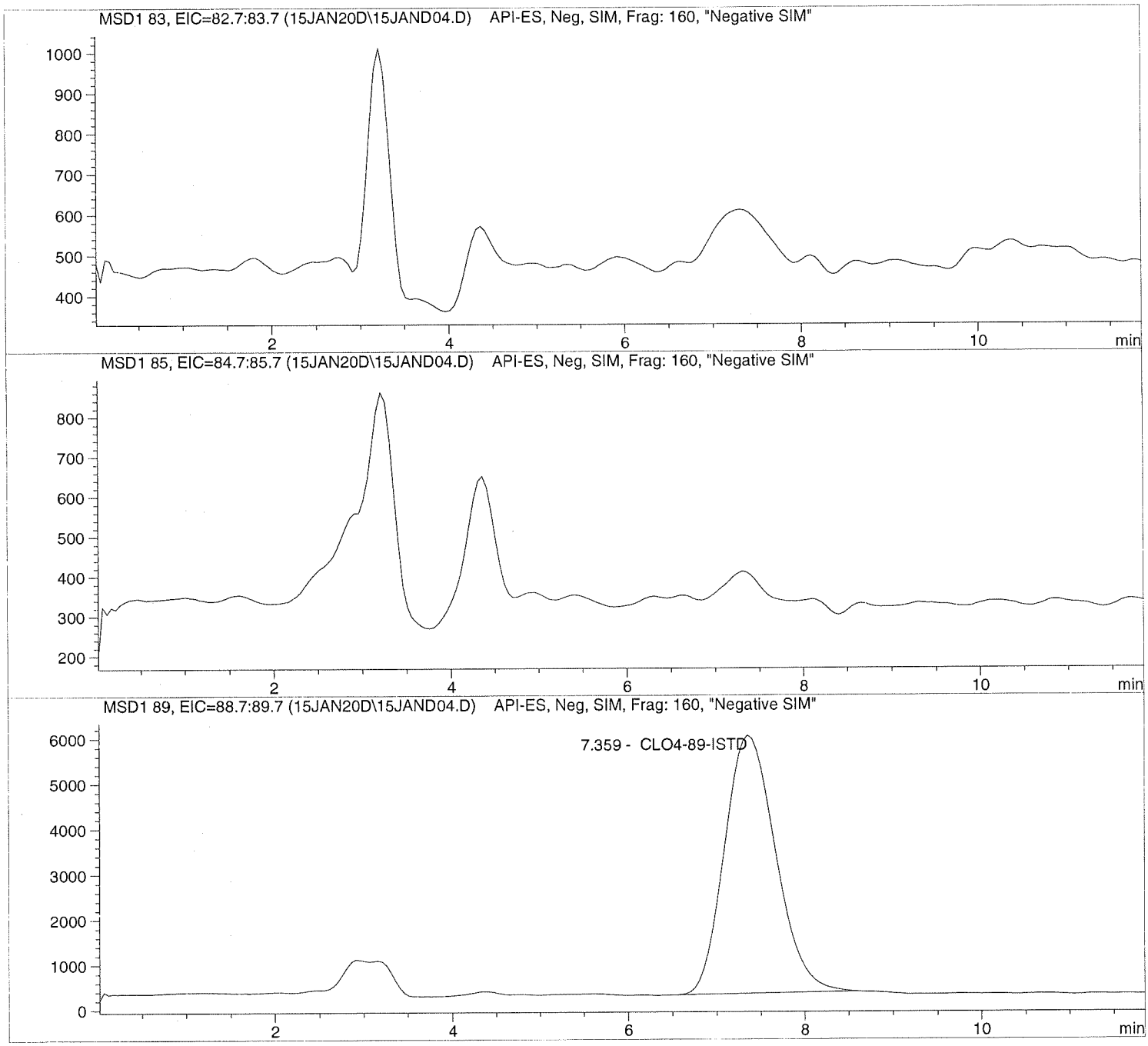
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\15JAN20D\15JAND04.D Sample Name: 691930 LMB

Injection Date:	1/15/2020 09:54:46	Seq Line:	4
Sample Name:	691930 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\15JAN20D\15JAND04.D Sample Name: 691930 LMB

Injection Date:	1/15/2020 09:54:46	Seq Line:	4
Sample Name:	691930 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
7.359	PBA	229508.7	5.0000	CLO4-89-ISTD

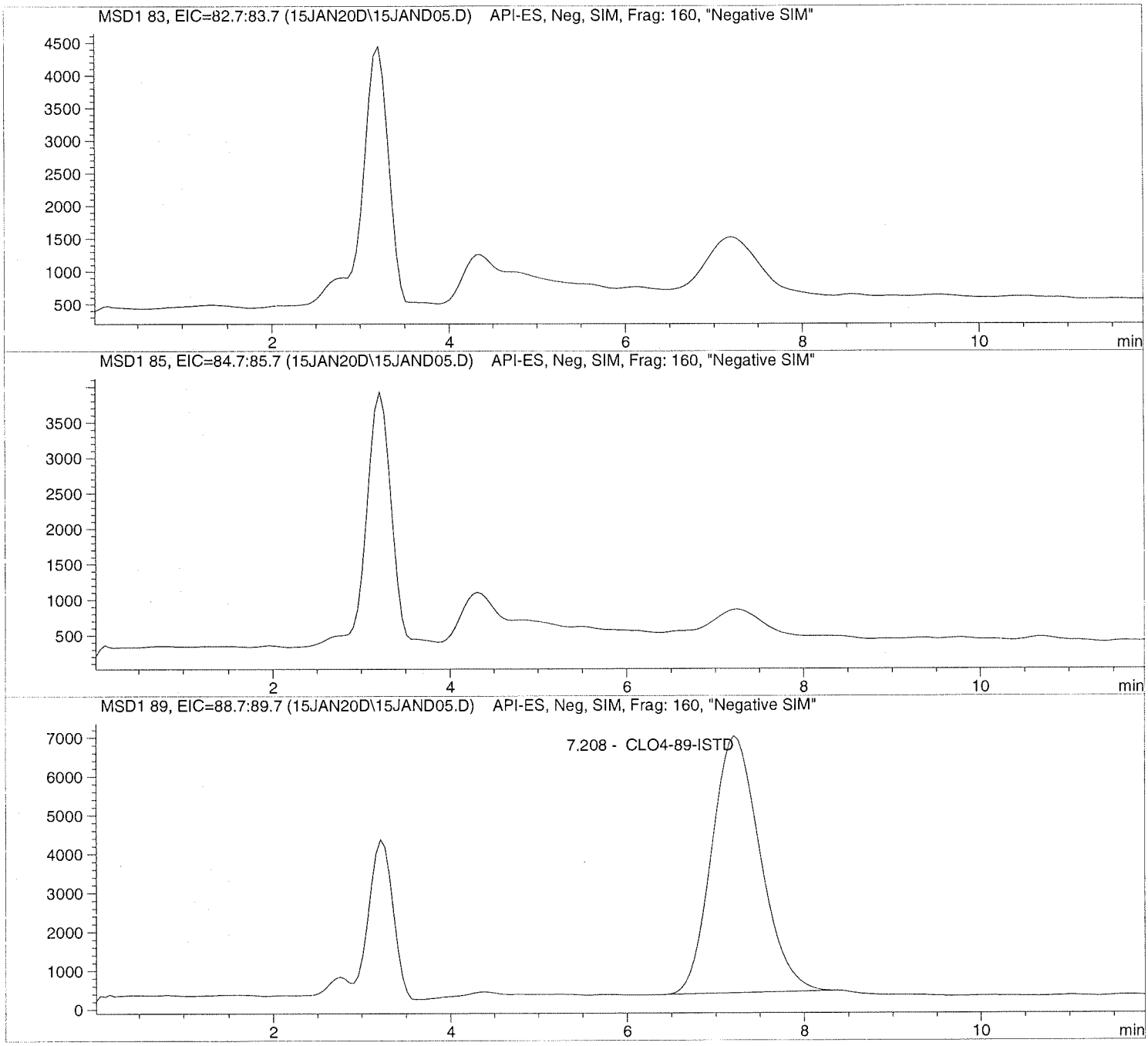
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\15JAN20D\15JAND05.D Sample Name: 2000307001

Injection Date:	1/15/2020 10:08:38	Seq Line:	5
Sample Name:	2000307001	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\15JAN20D\15JAND05.D Sample Name: 2000307001

Injection Date:	1/15/2020 10:08:38	Seq Line:	5
Sample Name:	2000307001	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
7.208	PBA	252311.3	5.0000	CLO4-89-ISTD

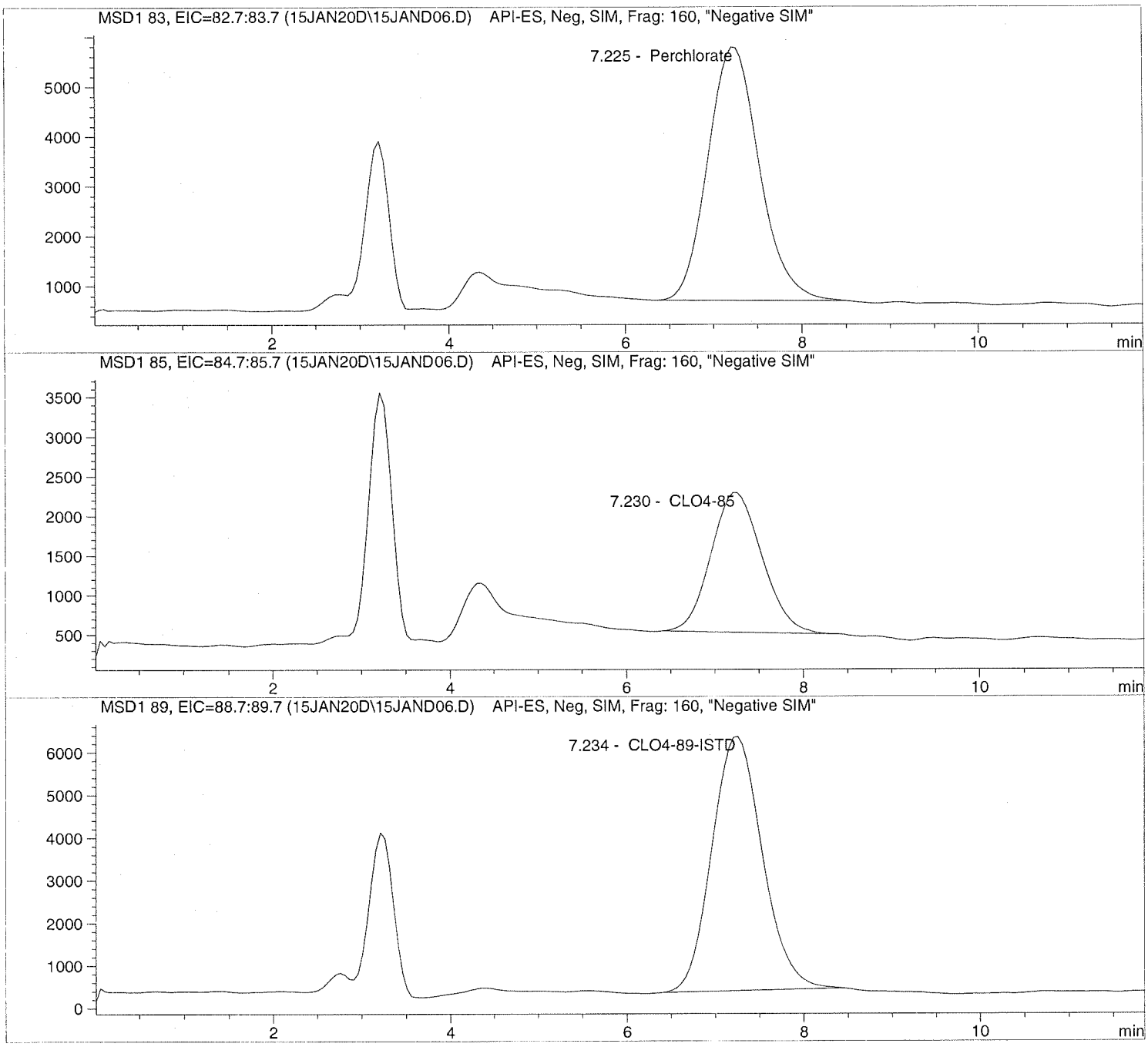
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\15JAN20D\15JAND06.D Sample Name: 691932 03071MS

Injection Date:	1/15/2020 10:22:29	Seq Line:	6
Sample Name:	691932 03071MS	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\15JAN20D\15JAND06.D Sample Name: 691932 03071MS

Injection Date:	1/15/2020 10:22:29	Seq Line:	6
Sample Name:	691932 03071MS	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
7.225	PBA	205477.1	3.1982	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.230	PBA	71046.0	3.5380	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.234	PBA	236573.4	5.0000	CLO4-89-ISTD

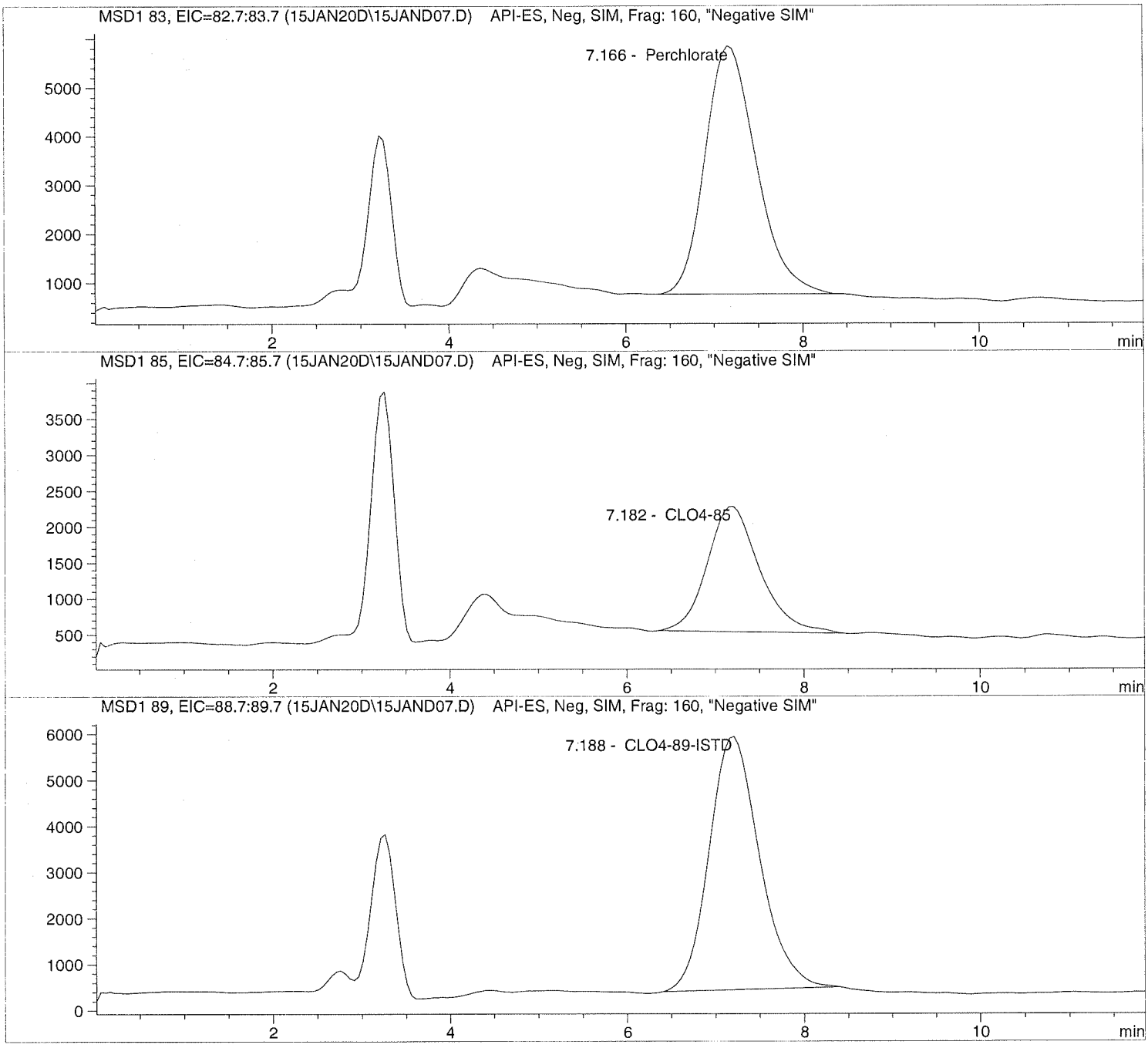
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\15JAN20D\15JAND07.D Sample Name: 691933 03071SD

Injection Date:	1/15/2020 10:36:32	Seq Line:	7
Sample Name:	691933 03071SD	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\15JAN20D\15JAND07.D Sample Name: 691933 03071SD

Injection Date:	1/15/2020 10:36:32	Seq Line:	7
Sample Name:	691933 03071SD	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
7.166	PBA	203421.1	3.4598	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.182	PBA	71715.4	3.9101	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.188	PBA	216654.6	5.0000	CLO4-89-ISTD

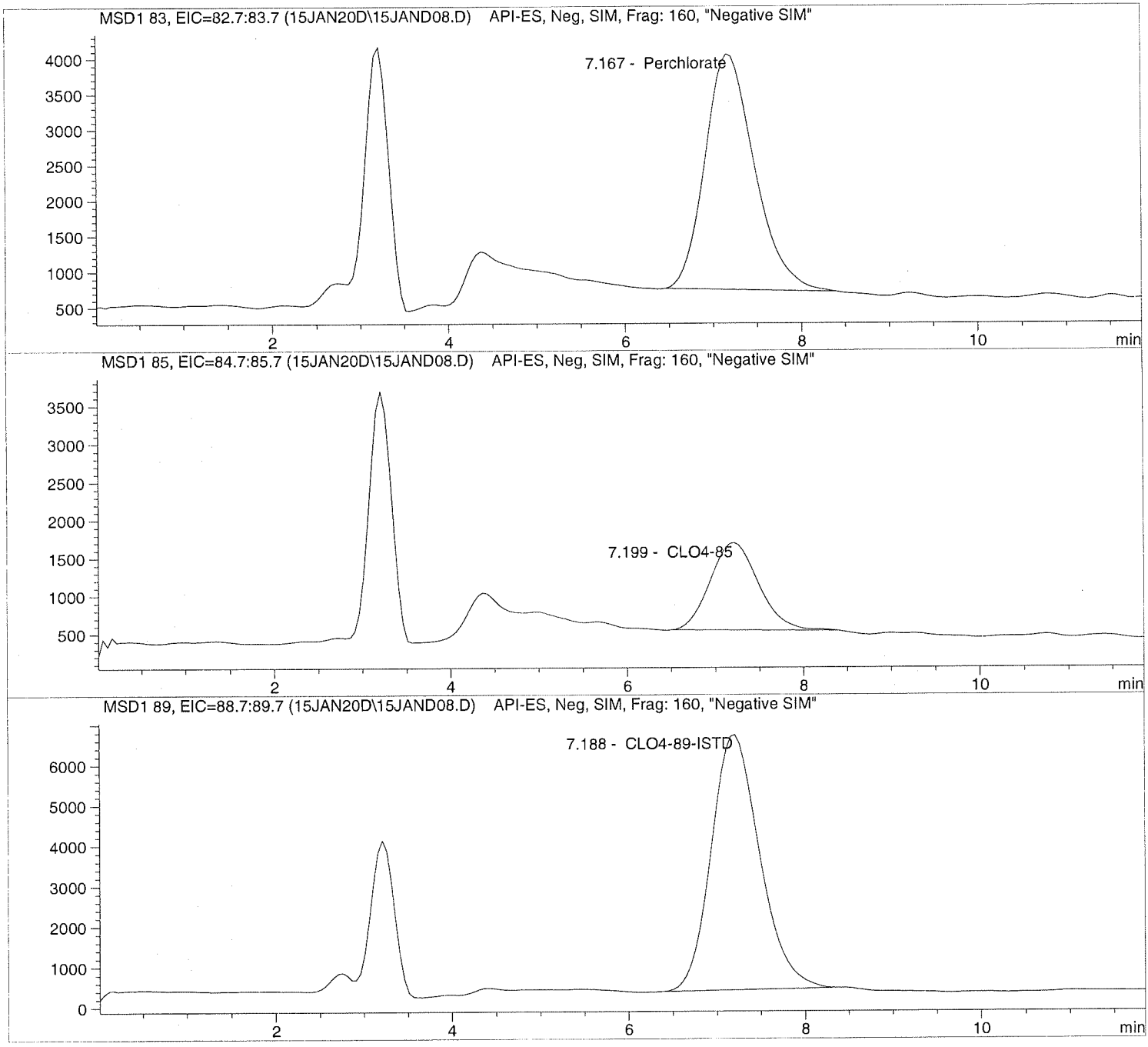
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\15JAN20D\15JAND08.D Sample Name: 2000949001

Injection Date:	1/15/2020 10:50:37	Seq Line:	8
Sample Name:	2000949001	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



Data file: C:\HPCHEM\1\DATA\15JAN20D\15JAND08.D Sample Name: 2000949001

Injection Date:	1/15/2020 10:50:37	Seq Line:	8
Sample Name:	2000949001	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
7.167	PBA	128801.7	1.9506	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.199	PBA	43933.1	2.0995	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.188	PBA	240635.1	5.0000	CLO4-89-ISTD

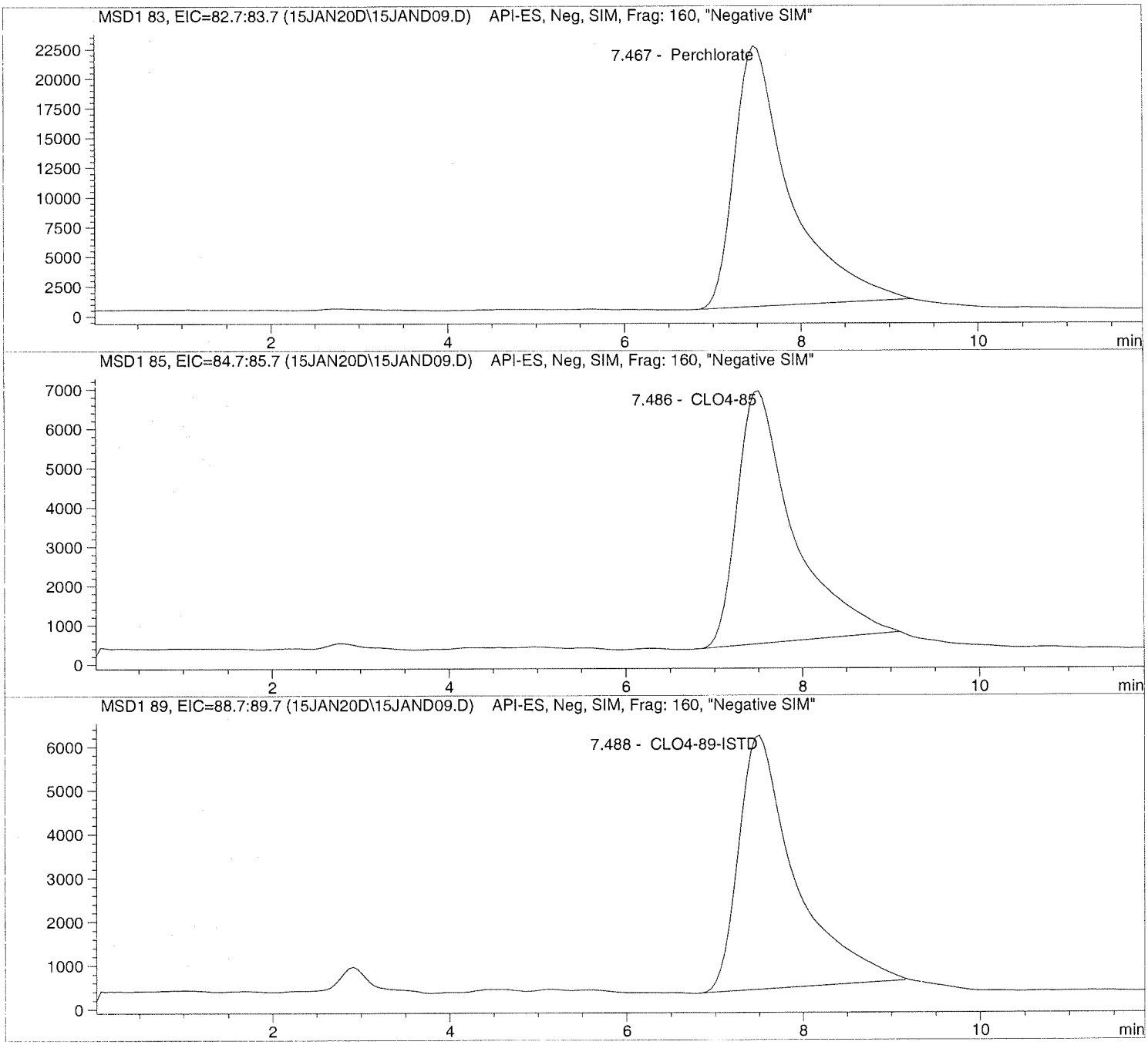
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\15JAN20D\15JAND09.D Sample Name: 2000952001 1K

Injection Date:	1/15/2020 11:04:28	Seq Line:	9
Sample Name:	2000952001 1K	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\15JAN20D\15JAND09.D Sample Name: 2000952001 1K

Injection Date:	1/15/2020 11:04:28	Seq Line:	9
Sample Name:	2000952001 1K	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:	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
7.467	PBA	969191.8	13367.4646	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.486	PBA	285347.1	12849.8345	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.488	PBA	259888.6	5000.0000	CLO4-89-ISTD

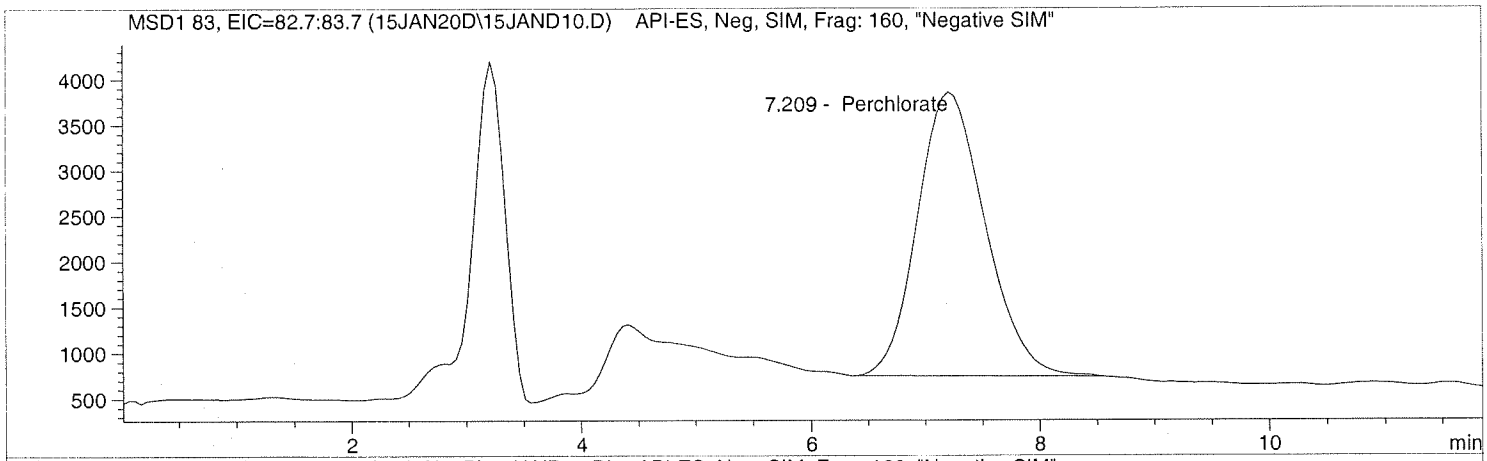
*** End of Report ***

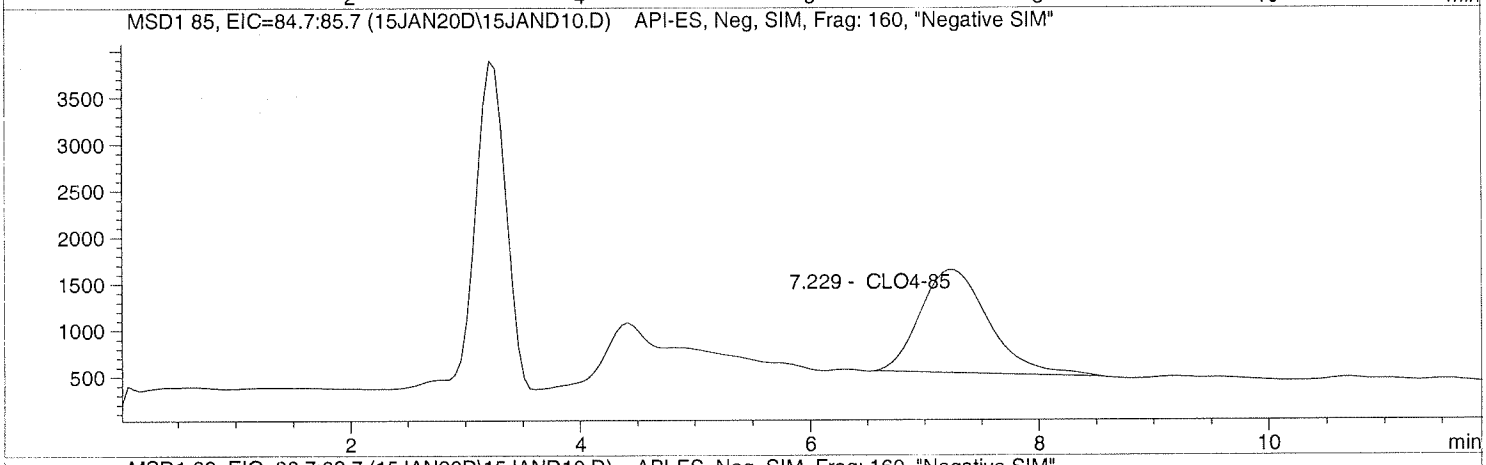
Data file: C:\HPCHEM\1\DATA\15JAN20D\15JAND10.D Sample Name: 2000953001

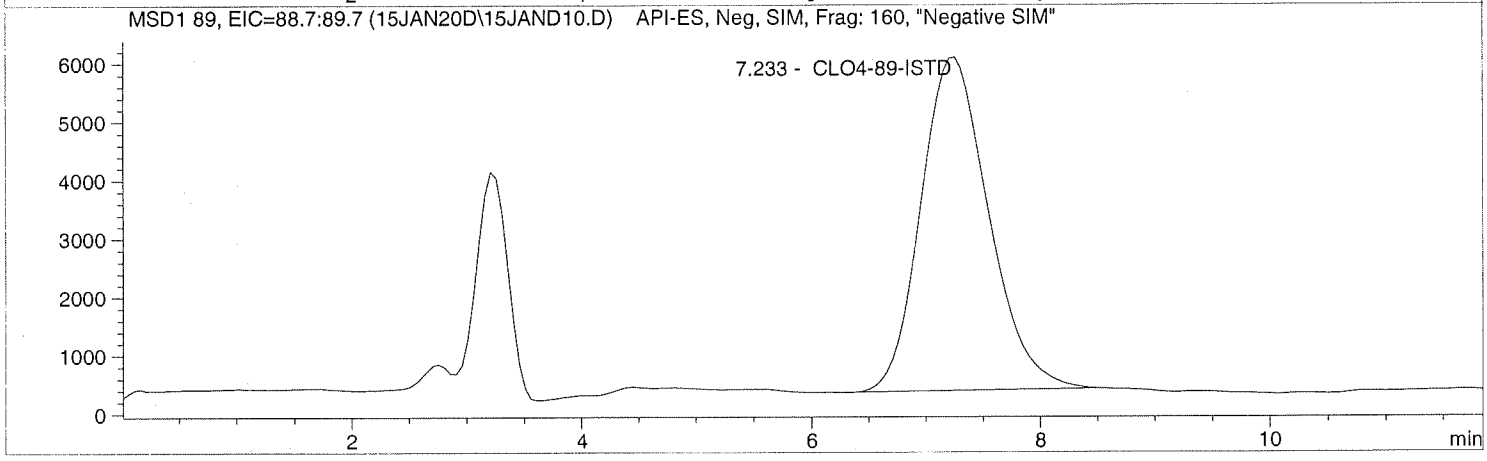
Injection Date:	1/15/2020 11:18:21	Seq Line:	10
Sample Name:	2000953001	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

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\15JAN20D\15JAND10.D Sample Name: 2000953001

Injection Date:	1/15/2020 11:18:21	Seq Line:	10
Sample Name:	2000953001	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
7.209	PBA	127923.8	1.9845	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.229	PBA	46374.8	2.2805	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.233	PBA	235039.6	5.0000	CLO4-89-ISTD

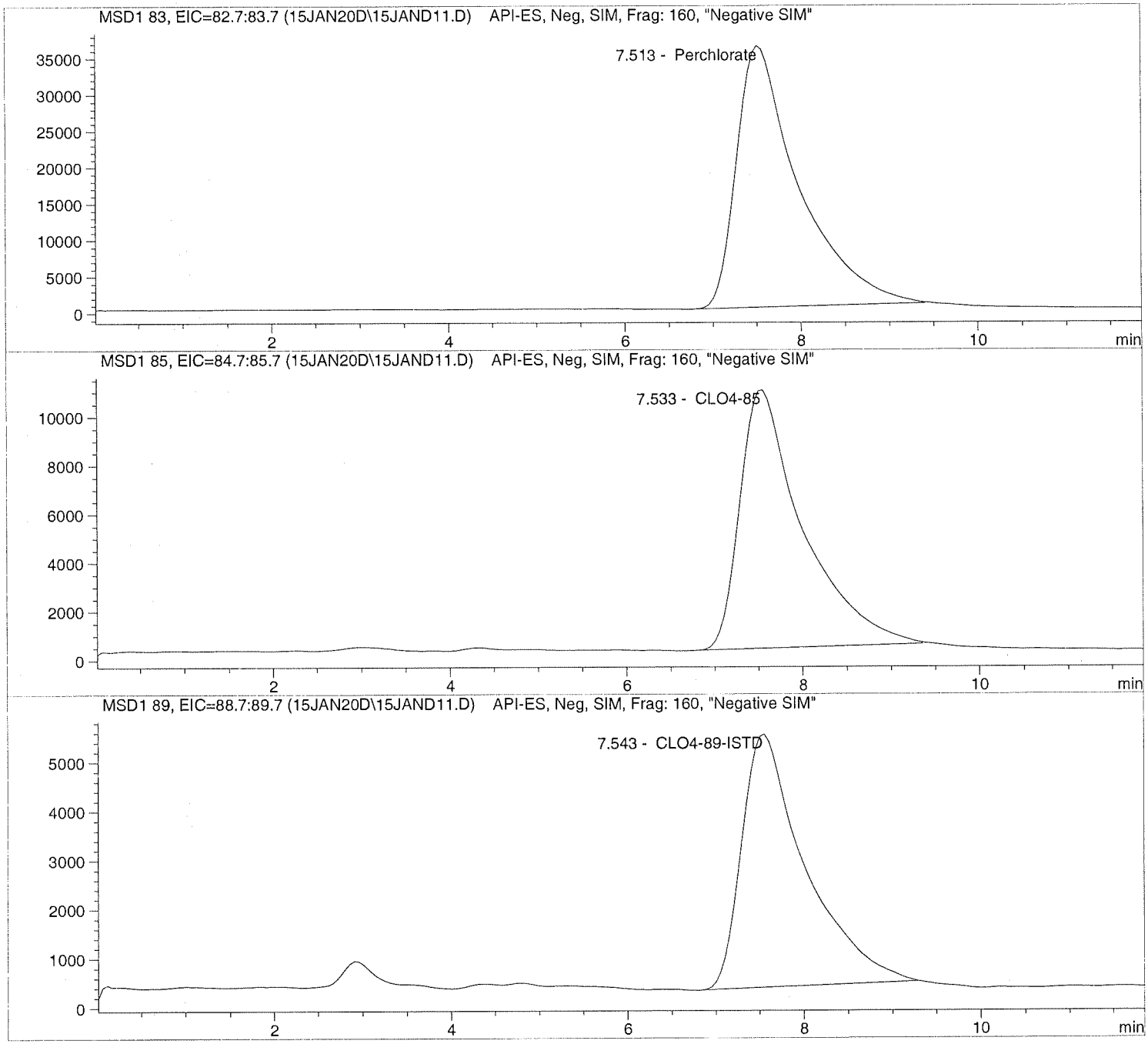
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\15JAN20D\15JAND11.D Sample Name: 691934 CCV@25

Injection Date:	1/15/2020 11:33:15	Seq Line:	11
Sample Name:	691934 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\15JAN20D\15JAND11.D Sample Name: 691934 CCV@25

Injection Date:	1/15/2020 11:33:15	Seq Line:	11
Sample Name:	691934 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
7.513	PBA	1751693.0	23.4055	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.533	PBA	525076.8	23.0255	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.543	PBA	257414.7	5.0000	CLO4-89-ISTD

*** End of Report ***



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Initial Calibration

Method C:\HPCHEM\1\METHODS\CLO4-DP3.M

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]	Sig	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]	Sig	Lvl	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

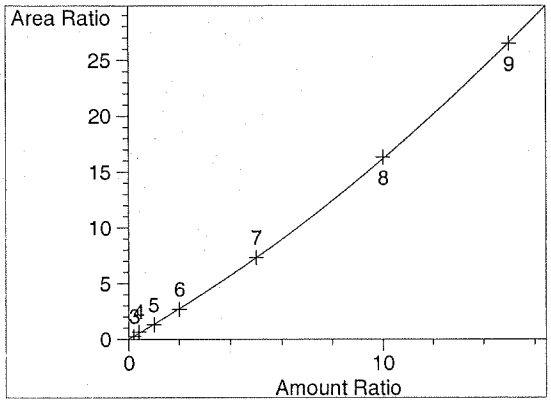
Compound: CLO4-89-ISTD
- Time Window : From 3.581 min To 11.896 min
- Curve Type : Linear
- Origin : Included
- Calibration Level Weights:/
  - Level 3 : 1
  - Level 4 : 1
  - Level 5 : 1
  - Level 6 : 1
  - Level 7 : 1
  - Level 8 : 1
  - Level 9 : 1

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

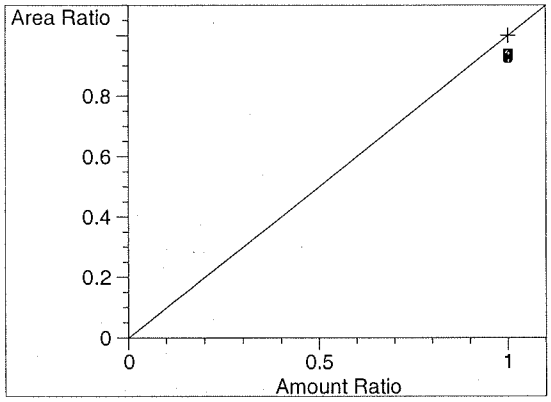
Peak Sum Table

No Entries in table

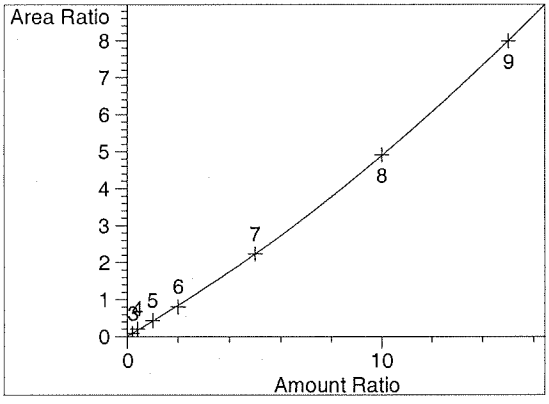
Calibration Curves



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

00968710

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:

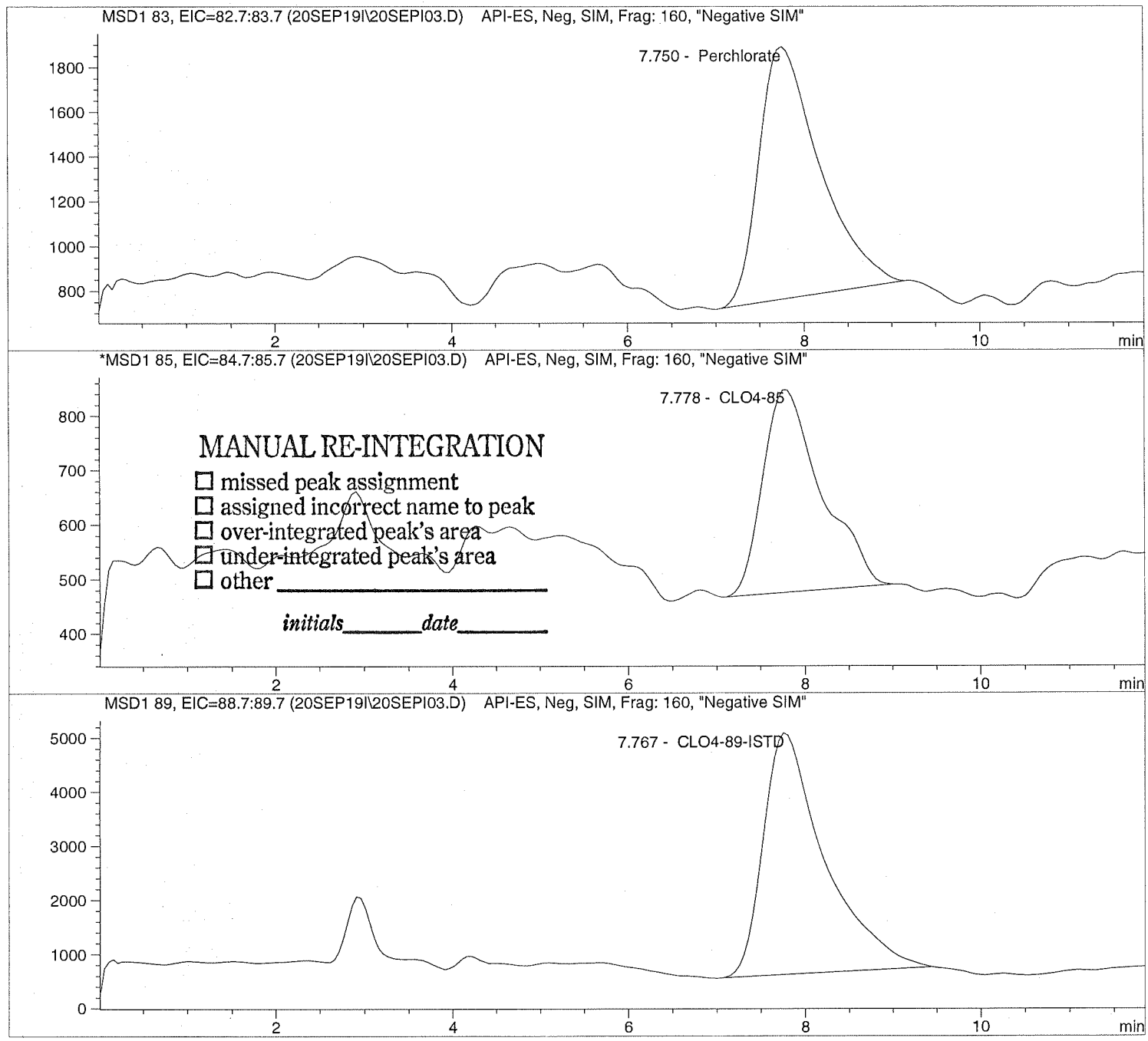
Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
1	Vial 71	CLO4@ 0.2ug/L	CLO4-AQN	1	Ctrl Samp		
2	Vial 72	CLO4@ 0.5ug/L	CLO4-AQN	1	Ctrl Samp		
3	Vial 73	CLO4@ 1.0ug/L	CLO4-AQN	1	Ctrl Samp		
4	Vial 74	CLO4@ 2.0ug/L	CLO4-AQN	1	Ctrl Samp		
5	Vial 75	CLO4@ 5.0ug/L	CLO4-AQN	1	Ctrl Samp		
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

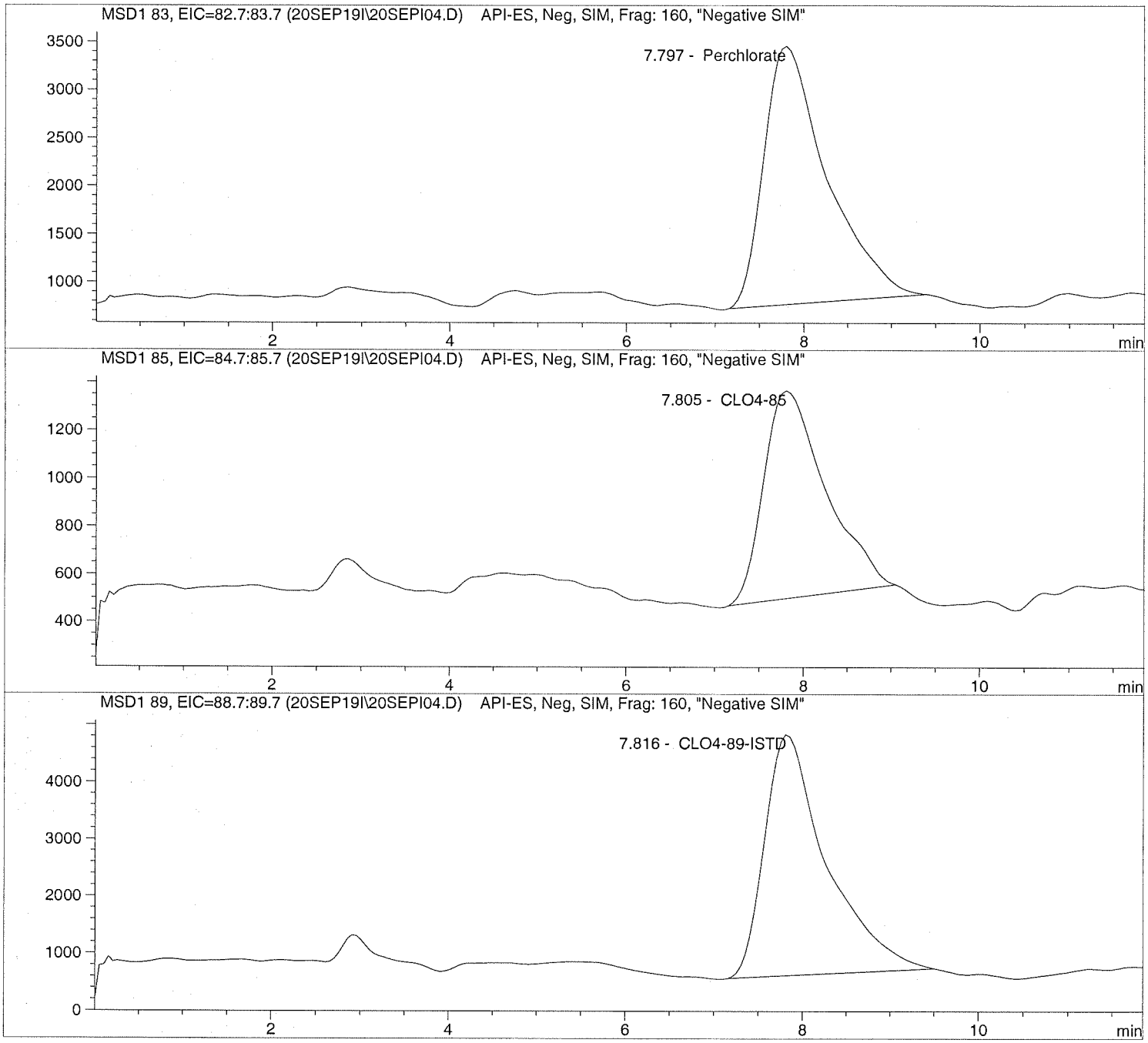
*** End of Report ***

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

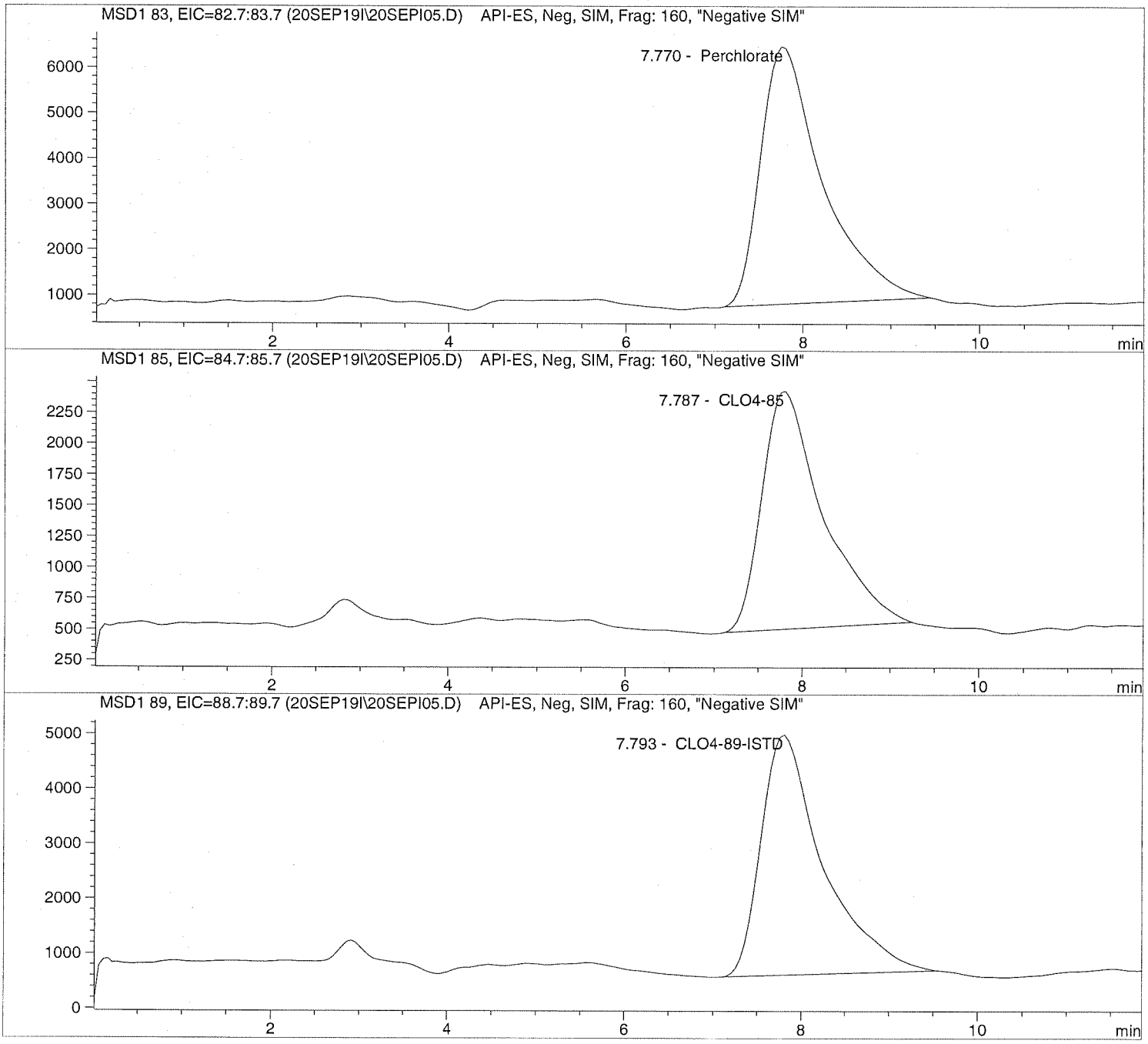
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\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

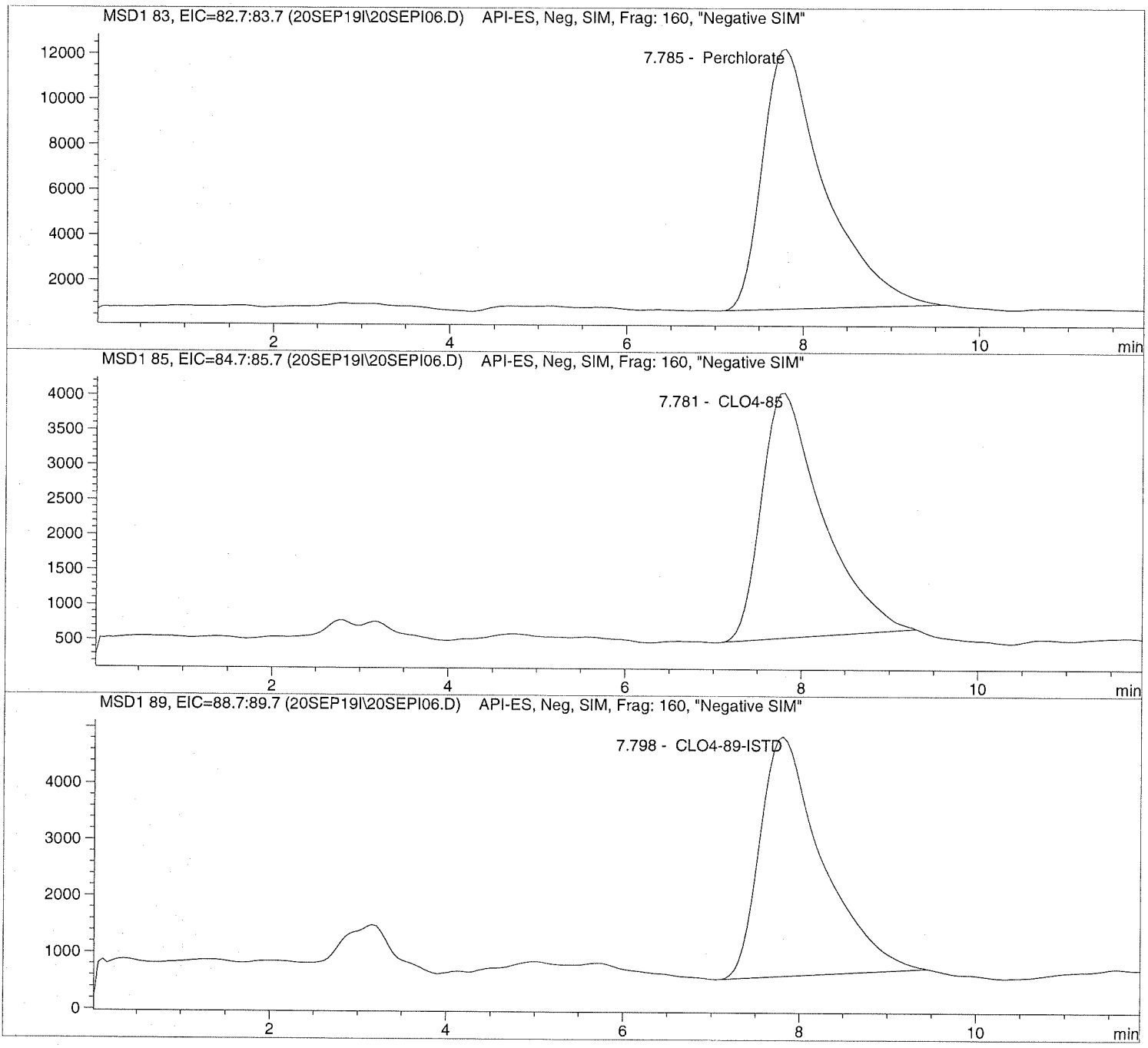
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI06.D Sample Name: CLO4@ 10.ug/L

Injection Date:	9/20/2019 10:05:36	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

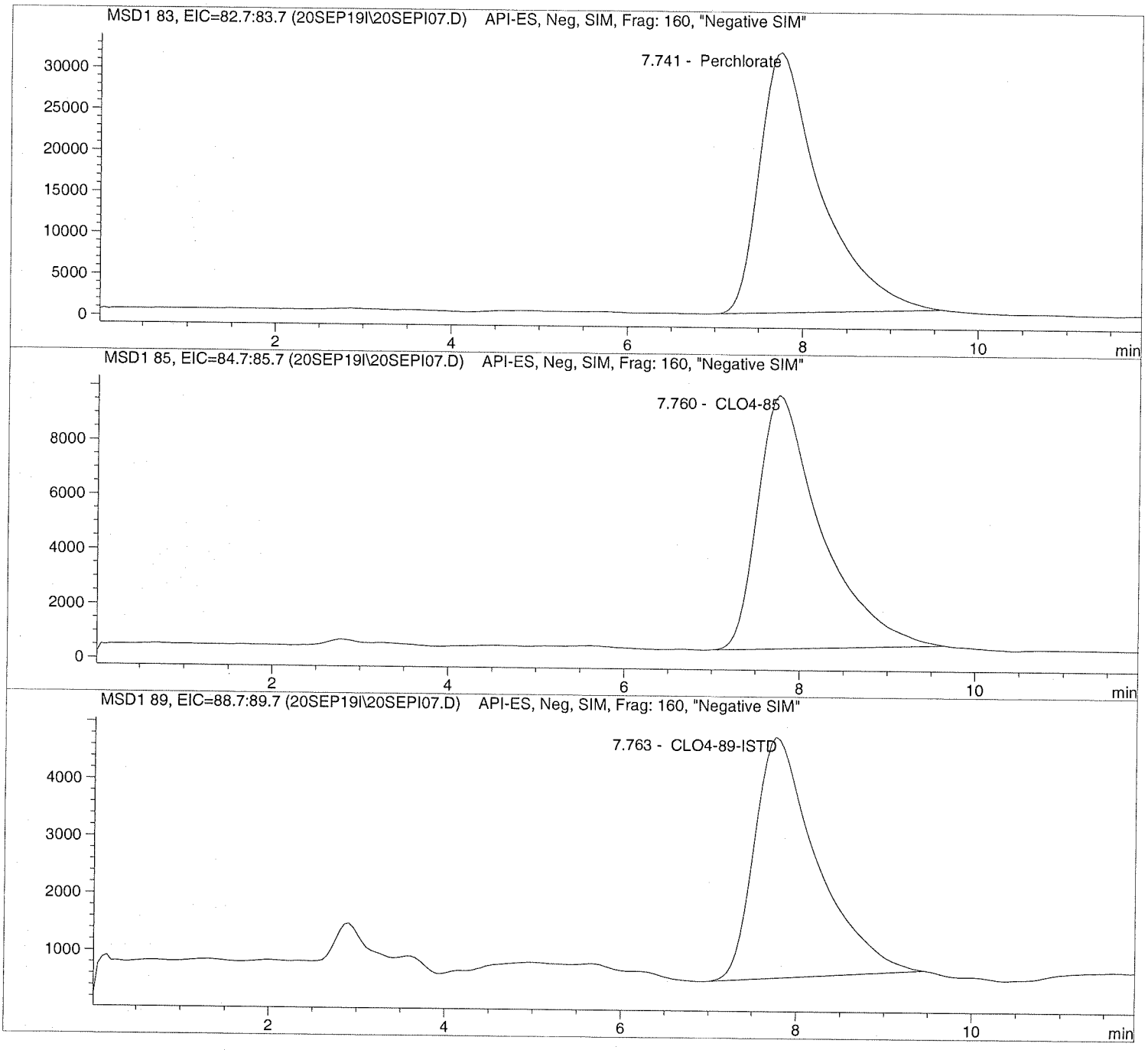
*** End of Report ***

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

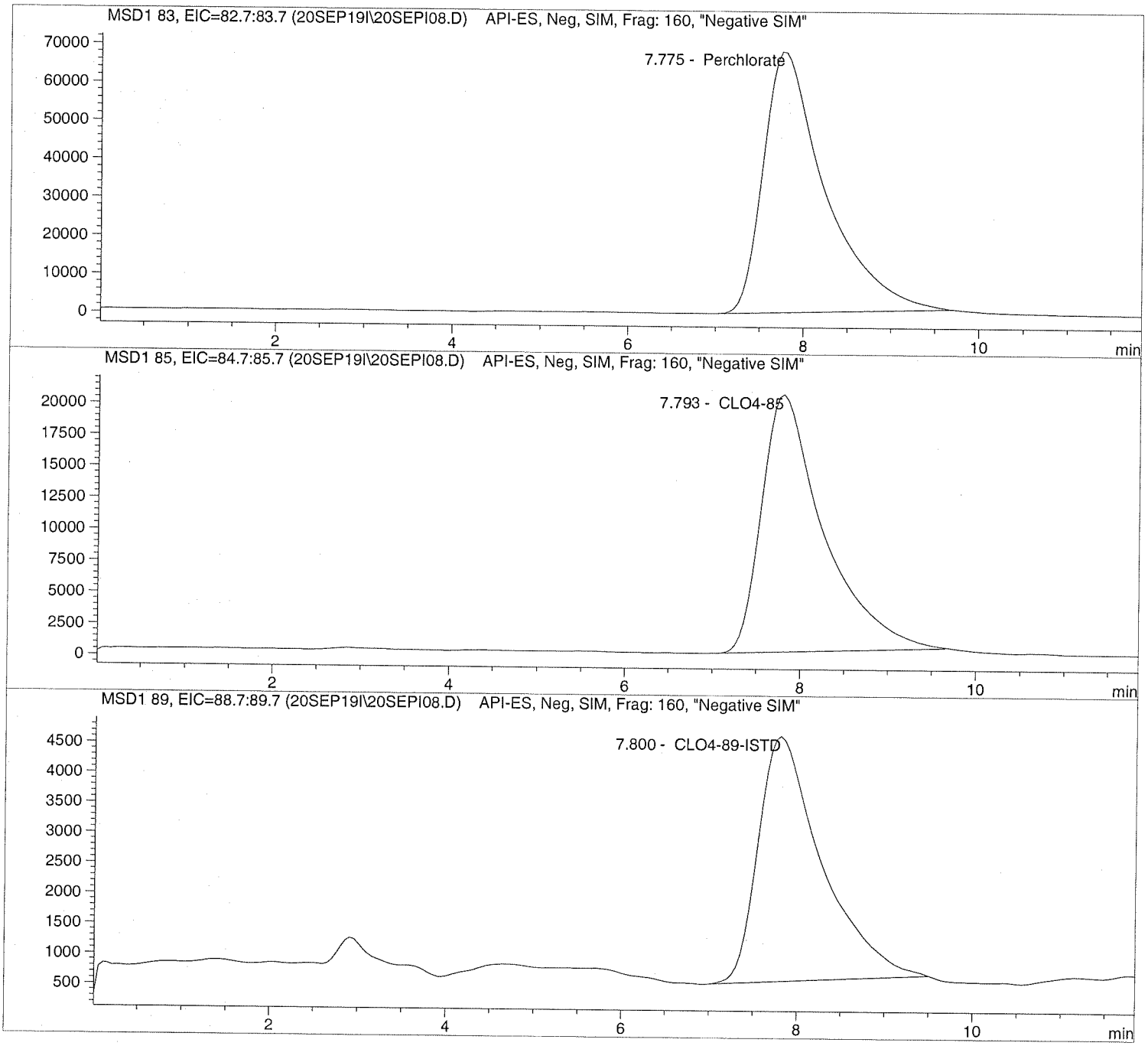
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\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

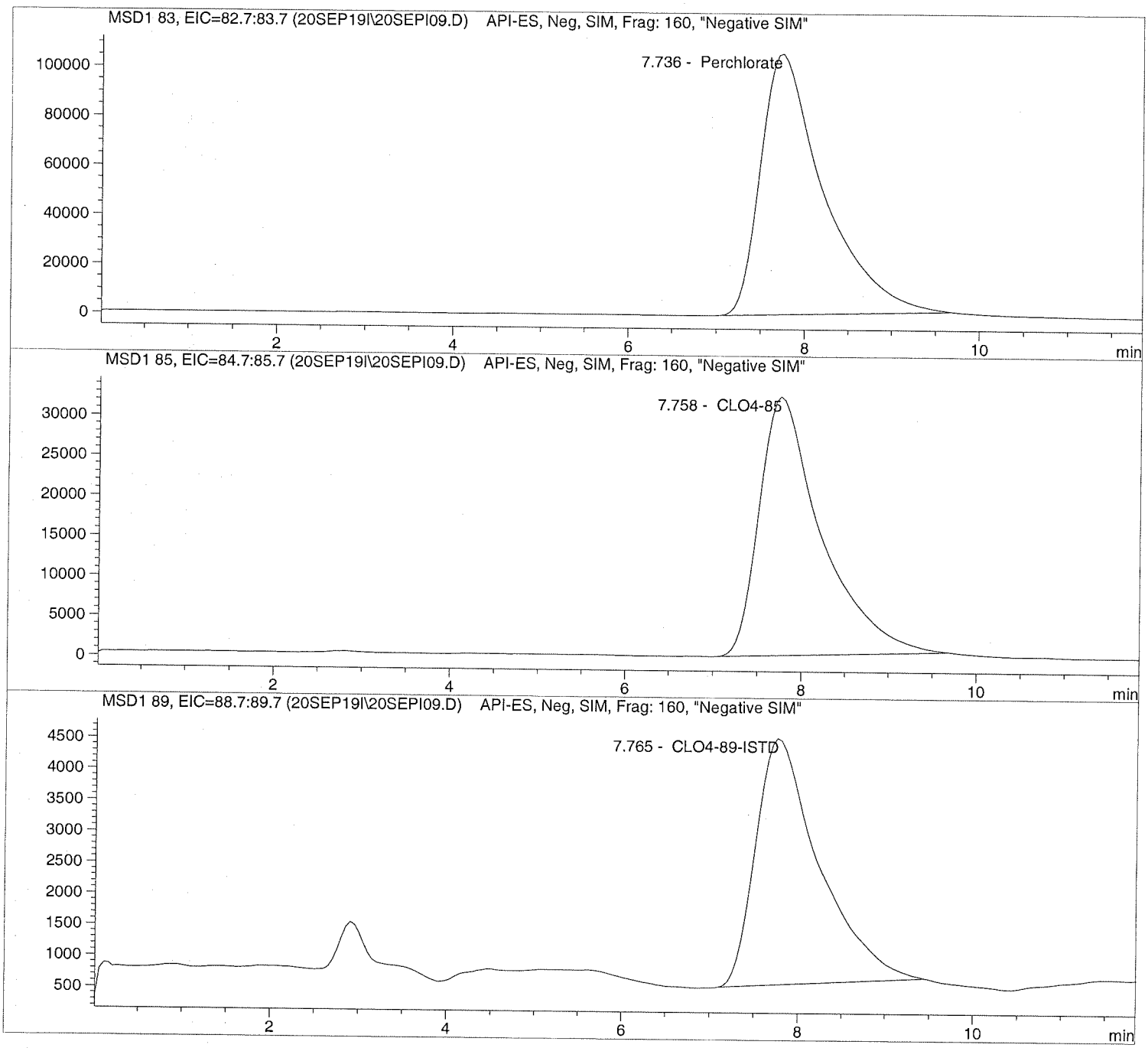
*** End of Report ***

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

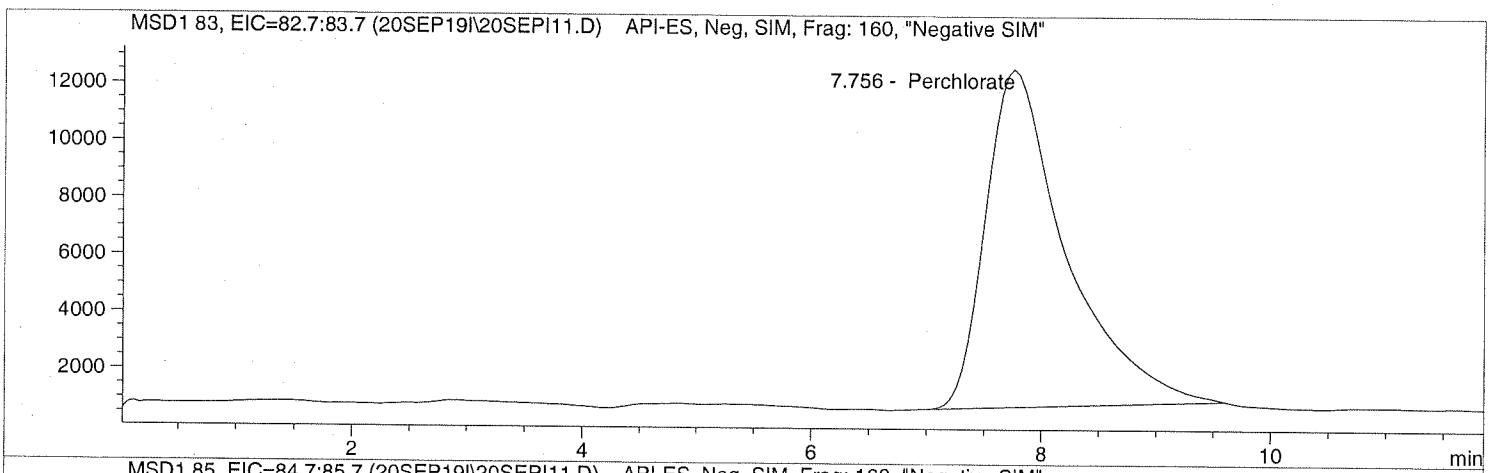
*** End of Report ***

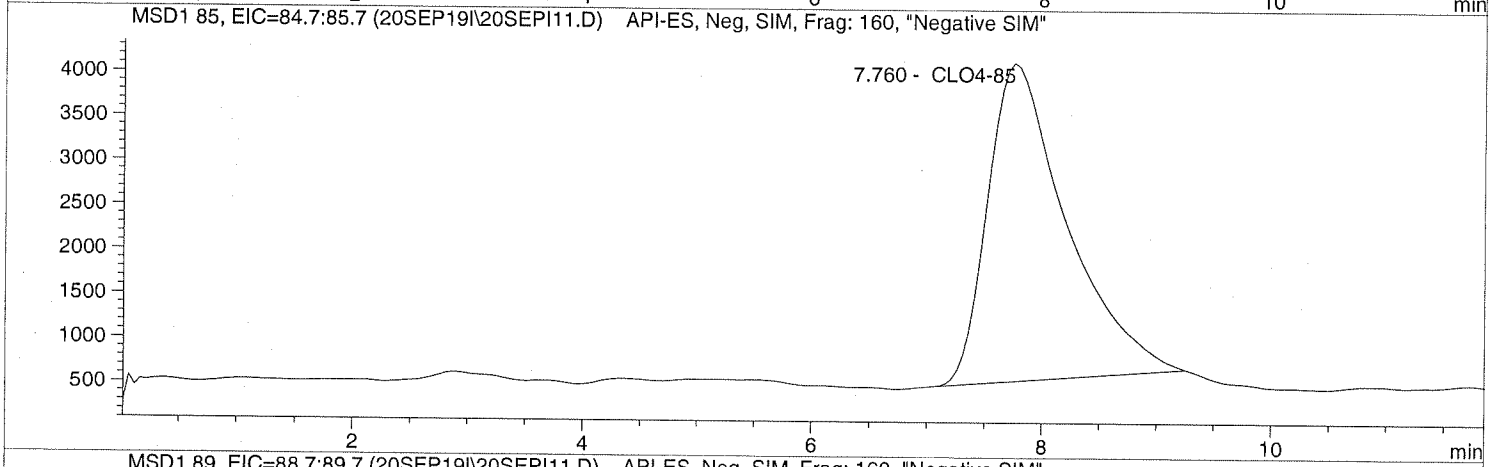
Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI11.D Sample Name: ICAL Verf@10ug/L

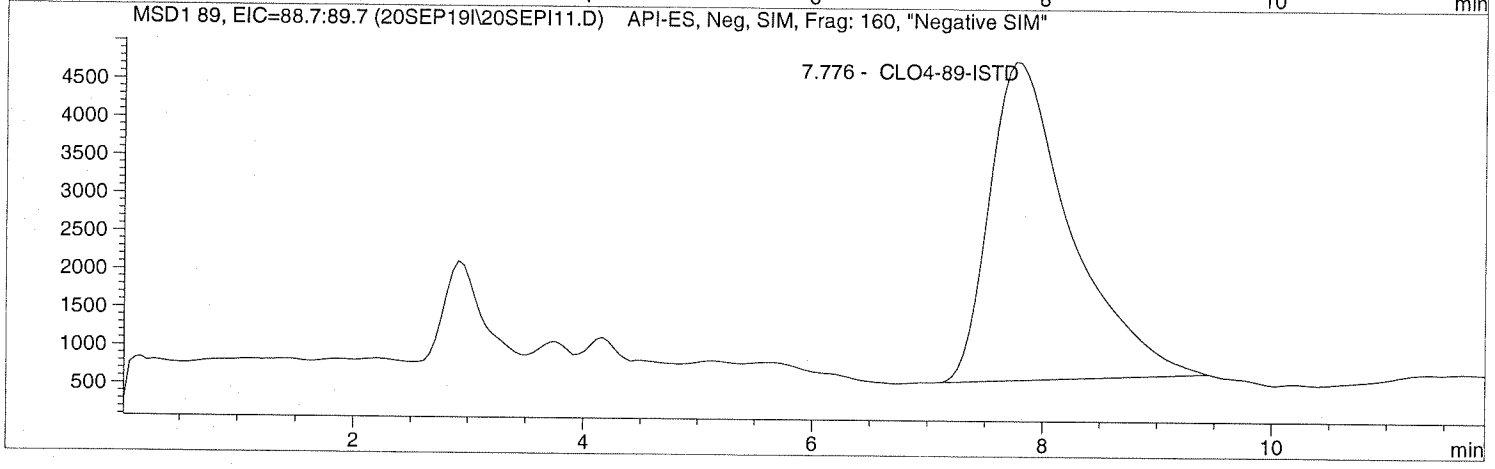
Injection Date:	9/20/2019 11:14:45	Seq Line:	11
Sample Name:	ICAL Verf@10ug/L	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

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 ***

00968728



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

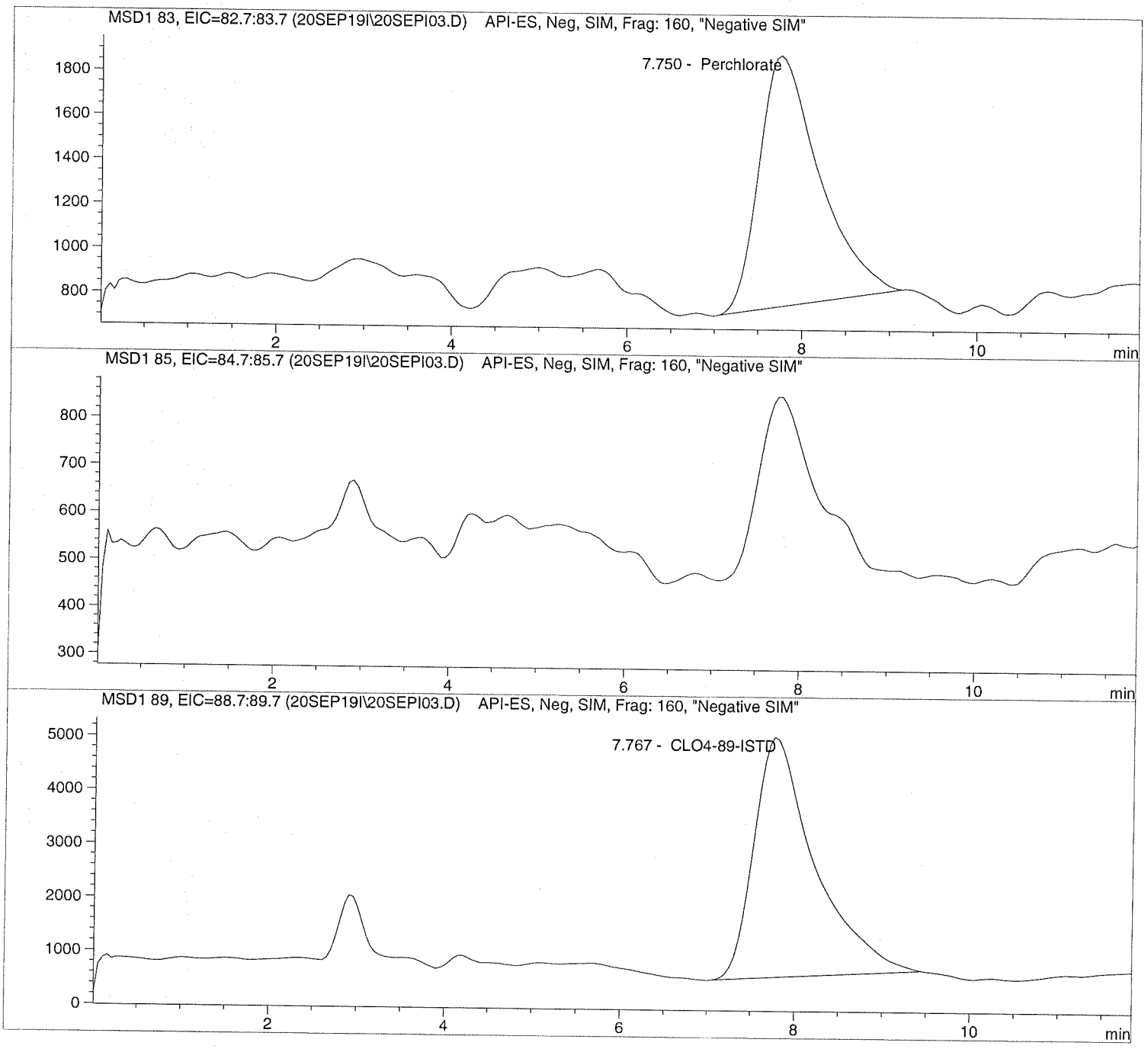
Unmodified

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
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F: +1 281 530 5887

January 21, 2020

Marcia Olive
Bhate Environmental Associates, Inc.
445 Union Blvd Ste 129
Lakewood, CO 80228

Work Order: **HS20010261**

Laboratory Results for: **Longhorn GW Treatment Plant Weekly Samples**

Dear Marcia,

ALS Environmental received 2 sample(s) on Jan 08, 2020 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: 21-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Weekly Samples
Work Order: HS20010261

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS20010261-01	LH18/24-SP650_010720	Water		07-Jan-2020 14:00	08-Jan-2020 08:58	☐
HS20010261-02	LH18/24-SP650_010720_BIX	Water		07-Jan-2020 14:00	08-Jan-2020 08:58	☐

ALS Houston, US Date: 21-Jan-20

Client: Bhate Environmental Associates, Inc. **CASE NARRATIVE**
Project: Longhorn GW Treatment Plant Weekly Samples
Work Order: HS20010261

Work Order Comments

- The analysis for Perchlorate was subcontracted to ALS Salt Lake City, UT. Final report attached.

  The analysis for TOC was subcontracted to ALS Kelso, WA. Final report attached.

WetChemistry by Method E365.3

Batch ID: R354760

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

WetChemistry by Method E350.3

Batch ID: R354387

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

ALS Houston, US Date: 21-Jan-20

Client: Bhate Environmental Associates, Inc.
ANALYTICAL REPORT
Project: Longhorn GW Treatment Plant Weekly Samples
WorkOrder:HS20010261
Sample ID: LH18/24-SP650_010720
Lab ID:HS20010261-01
Collection Date: 07-Jan-2020 14:00
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
AMMONIA AS N BY E350.3(ISE)		**Method:E350.3**						Analyst: RG
Nitrogen, Ammonia (As N)	**0.79**	a	**0.20**	**0.10**	**0.20**	**mg/L**	1	14-Jan-2020 15:00
ORTHO PHOSPHATE (PO4) AS P BY E365.3		**Method:E365.3**						Analyst: MZD
Phosphorus, Total Orthophosphate (As P)	**0.171**	a	**0.0100**	**0.0250**	**0.0250**	**mg/L**	1	09-Jan-2020 10:54
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	17-Jan-2020 09:12

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

ALS Houston, US Date: 21-Jan-20

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**

Project: Longhorn GW Treatment Plant Weekly Samples WorkOrder:HS20010261

Sample ID: LH18/24-SP650_010720_BIX Lab ID:HS20010261-02

Collection Date: 07-Jan-2020 14:00 Matrix:Water

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	15-Jan-2020 16:41

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

ALS Houston, US Date: 21-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Weekly Samples
WorkOrder: HS20010261

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R354387 (0)	**Test Name :** AMMONIA AS N BY E350.3(ISE)				**Matrix:** Water	
HS20010261-01	LH18/24-SP650_010720	07 Jan 2020 14:00			14 Jan 2020 15:00	1
Batch ID: R354450 (0)	**Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)				**Matrix:** Water	
HS20010261-02	LH18/24-SP650_010720_BIX	07 Jan 2020 14:00			15 Jan 2020 16:41	1
Batch ID: R354545 (0)	**Test Name :** SUBCONTRACT ANALYSIS - TOC ANALYSIS				**Matrix:** Water	
HS20010261-01	LH18/24-SP650_010720	07 Jan 2020 14:00			17 Jan 2020 09:12	1
Batch ID: R354760 (0)	**Test Name :** ORTHO PHOSPHATE (PO4) AS P BY E365.3				**Matrix:** Water	
HS20010261-01	LH18/24-SP650_010720	07 Jan 2020 14:00			09 Jan 2020 10:54	1

ALS Houston, US Date: 21-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Weekly Samples
WorkOrder: HS20010261

QC BATCH REPORT

Batch ID: R354387 (0) **Instrument: WetChem_HS** **Method: AMMONIA AS N BY E350.3(ISE)**

MBLK Sample ID: **MBLK-R354387** Units: **mg/L** Analysis Date: **14-Jan-2020 15:00**
Client ID: Run ID: **WetChem_HS_354387** SeqNo: **5434789** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Ammonia (As N)	0.10	0.20								U

LCS Sample ID: **LCS-R354387** Units: **mg/L** Analysis Date: **14-Jan-2020 15:00**
Client ID: Run ID: **WetChem_HS_354387** SeqNo: **5434788** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Ammonia (As N)	10.38	0.20	10	0	104	80 - 120				

MS Sample ID: **HS20010410-01MS** Units: **mg/L** Analysis Date: **14-Jan-2020 15:00**
Client ID: Run ID: **WetChem_HS_354387** SeqNo: **5434791** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Ammonia (As N)	10.19	0.20	10	0.092	101	80 - 120				

MSD Sample ID: **HS20010410-01MSD** Units: **mg/L** Analysis Date: **14-Jan-2020 15:00**
Client ID: Run ID: **WetChem_HS_354387** SeqNo: **5434790** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Ammonia (As N)	10.16	0.20	10	0.092	101	80 - 120	10.19	0.344	20	

The following samples were analyzed in this batch: HS20010261-01

ALS Houston, US Date: 21-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Weekly Samples
WorkOrder: HS20010261

QC BATCH REPORT

Batch ID: R354760 (0) **Instrument:** UV-2450 **Method:** ORTHO PHOSPHATE (PO4) AS P BY E365.3

MBLK Sample ID: **MBLK-354760** Units: **mg/L** Analysis Date: **09-Jan-2020 10:54**
Client ID: Run ID: **UV-2450_354760** SeqNo: **5442357** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total Orthophosphate (As P)	0.0250	0.0250								U

LCS Sample ID: **LCS-354760** Units: **mg/L** Analysis Date: **09-Jan-2020 10:54**
Client ID: Run ID: **UV-2450_354760** SeqNo: **5442358** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total Orthophosphate (As P)	0.229	0.0250	0.25	0	91.6	85 - 115				

MS Sample ID: **HS20010261-01MS** Units: **mg/L** Analysis Date: **09-Jan-2020 10:54**
Client ID: **LH18/24-SP650_010720** Run ID: **UV-2450_354760** SeqNo: **5442360** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total Orthophosphate (As P)	0.396	0.0250	0.25	0.171	90.0	80 - 120				

MSD Sample ID: **HS20010261-01MSD** Units: **mg/L** Analysis Date: **09-Jan-2020 10:54**
Client ID: **LH18/24-SP650_010720** Run ID: **UV-2450_354760** SeqNo: **5442361** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total Orthophosphate (As P)	0.397	0.0250	0.25	0.171	90.4	80 - 120	0.396	0.252	20	

The following samples were analyzed in this batch: HS20010261-01

ALS Houston, US Date: 21-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Weekly Samples
WorkOrder: **HS20010261**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	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	T104704231-19-25	30-Apr-2020

ALS Houston, US Date: 21-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Weekly Samples
Work Order: HS20010261

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS20010261-01	LH18/24-SP650_010720	Login	1/8/2020 11:19:25 AM	PMG	WET152
HS20010261-01	LH18/24-SP650_010720	Login	1/8/2020 11:19:25 AM	PMG	WET152
HS20010261-01	LH18/24-SP650_010720	Login	1/8/2020 11:19:25 AM	PMG	Sub
HS20010261-02	LH18/24-SP650_010720_BIX	Login	1/8/2020 11:19:25 AM	PMG	Sub

ALS Houston, US Date: 21-Jan-20

Sample Receipt Checklist

Client Name: Bhate Environmental
Work Order: HS20010261
Date/Time Received: **08-Jan-2020 08:58**
Received by: **PMG**

Checklist completed by: *Paresh M. Giga* eSignature 8-Jan-2020 Date
Reviewed by: *RJ Modashia* eSignature 8-Jan-2020 Date

Matrices: **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):	0.6c U/C	IR25
Cooler(s)/Kit(s):	42584	
Date/Time sample(s) sent to storage:	1/7/2020 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:

CHAIN OF CUSTODY

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

Page 1 of 1

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

Project No. NWO1312.0150.0 16.0001

Job:
GROUNDWATER TREATMENT PLANT WEEKLY SAMPLES

Prepared By: Scott Beesinger

P.O. Number

HS20010261
Bhate Environmental Associates, Inc.
Longhorn GW Treatment Plant Weekly Samples

Field Sample I.D.	Sample Matrix	Date / Time	MS / MSD	No. OF CONTAINERS	AMMONIA-N	TOTAL ORGANIC CARBON	ORTHO-PHOSPHATE	PERCHLORATE							Remarks (Preservatives, etc.)	Lab I.D.#
LH18/24-SP650_010720	Water	01/07/20 / 14:00		3	X	X									H2SO4	
LH18/24-SP650_010720	Water	01/07/20 / 14:00		1			X								NONE	
LH18/24–SP650_010720_BIX	Water	01/07/20 / 14:00		1				X							NONE	

Additional Remarks: **Standard TAT on all parameters**

Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
Scott Beesinger	01/07/20	14:30	[signature]	1/8/20	08:58						

For Lab Use Only

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

Remarks:

42584 ulc. 0.6° +25 cl-0.0°

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

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

42,534

Date: 1/
Name: S
Company:

CUSTODY SEAL
7/20 Time: 1430
Scott Beesinger
Bhate

Seal Broken By:
Date: 1/8/20.

Must Deliver Next Business Day
Time and Tempature Sensitive!

ALS

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
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) 530-5656
REF: LHAAP-18/24-BO 68900-RJ

RMA:

FedEx Express

E

RETURNS MON-SAT
WED - 08 JAN 10:30A
PRIORITY OVERNIGHT

FedEx
TRK# 0221 1251 0292 4130

AB SGRA

77099
TX-US
IAH

FID 162785 07JAN20 GGGA 56AC2/DF82/05A2

ALS Environmental
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January 16, 2020

Analytical Report for Service Request No: K2000209

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

RE: HS20010261

Dear RJ,

Enclosed are the results of the sample(s) submitted to our laboratory January 09, 2020
For your reference, these analyses have been assigned our service request number **K2000209.**

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

RIGHT SOLUTIONS | RIGHT PARTNER

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Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LOD	Limit of Detection
LOQ	Limit of Quantitation
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

Inorganic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
E	The result is an estimate amount because the value exceeded the instrument calibration range.
J	The result is an estimated value.
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
i	The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
X	See case narrative.
Q	See case narrative. One or more quality control criteria was outside the limits.
H	The holding time for this test is immediately following sample collection. The samples were analyzed as soon as possible after receipt by the laboratory.

Metals Data Qualifiers

#	The control limit criteria is not applicable. See case narrative.
J	The result is an estimated value.
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
M	The duplicate injection precision was not met.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.
S	The reported value was determined by the Method of Standard Additions (MSA).
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
i	The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
X	See case narrative.
+	The correlation coefficient for the MSA is less than 0.995.
Q	See case narrative. One or more quality control criteria was outside the limits.

Organic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
A	A tentatively identified compound, a suspected aldol-condensation product.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
C	The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
D	The reported result is from a dilution.
E	The result is an estimated value.
J	The result is an estimated value.
N	The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
P	The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results.
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
i	The MRL/MDL or LOQ/LOD is elevated due to a chromatographic interference.
X	See case narrative.
Q	See case narrative. One or more quality control criteria was outside the limits.

Additional Petroleum Hydrocarbon Specific Qualifiers

F	The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
L	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
H	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
O	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
Y	The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
Z	The chromatographic fingerprint does not resemble a petroleum product.

00968748

ALS Group USA Corp. dba ALS Environmental (ALS) - Kelso
State Certifications, Accreditations, and Licenses

Agency	Web Site	Number
Alaska DEH	http://dec.alaska.gov/eh/lab/cs/csapproval.htm	UST-040
Arizona DHS	http://www.azdhs.gov/lab/license/env.htm	AZ0339
Arkansas - DEQ	http://www.adeq.state.ar.us/techsvs/labcert.htm	88-0637
California DHS (ELAP)	http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx	2795
DOD ELAP	http://www.denix.osd.mil/edqw/Accreditation/AccreditedLabs.cfm	L16-58-R4
Florida DOH	http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm	E87412
Hawaii DOH	http://health.hawaii.gov/	-
ISO 17025	http://www.pjlabs.com/	L16-57
Louisiana DEQ	http://www.deq.louisiana.gov/page/la-lab-accreditation	03016
Maine DHS	http://www.maine.gov/dhhs/	WA01276
Minnesota DOH	http://www.health.state.mn.us/accreditation	053-999-457
Nevada DEP	http://ndep.nv.gov/bsdw/labservice.htm	WA01276
New Jersey DEP	http://www.nj.gov/dep/enforcement/oqa.html	WA005
New York - DOH	https://www.wadsworth.org/regulatory/elap	12060
North Carolina DEQ	https://deq.nc.gov/about/divisions/water-resources/water-resources-data/water-sciences-home-page/laboratory-certification-branch/non-field-lab-certification	605
Oklahoma DEQ	http://www.deq.state.ok.us/CSDnew/labcert.htm	9801
Oregon – DEQ (NELAP)	http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	WA100010
South Carolina DHEC	http://www.scdhec.gov/environment/EnvironmentalLabCertification/	61002
Texas CEQ	http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html	T104704427
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C544
Wyoming (EPA Region 8)	https://www.epa.gov/region8-waterops/epa-region-8-certified-drinking-water-	-
Kelso Laboratory Website	www.alsglobal.com	NA

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. A complete listing of specific NELAP-certified analytes, can be found in the certification section at www.ALSGlobal.com or at the accreditation bodies web site.
Please refer to the certification and/or accreditation body's web site if samples are submitted for compliance purposes. The states highlighted above, require the analysis be listed on the state certification if used for compliance purposes and if the method/anlayte is offered by that state.

Case Narrative

ALS Environmental—Kelso Laboratory
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1317 South 13th Ave, Kelso, WA 98626 | 1-360-577-7222 | www.alsglobal.com

ALS Environmental

Client: ALS Environmental - US
Project: HS20010261
Sample Matrix: Water

Service Request: K2000209
Date Received: 01/09/2020

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:

One water sample was received for analysis at ALS Environmental on 01/09/2020. Any discrepancies upon initial sample inspection are annotated on the sample receipt and preservation form included within this report. The sample was stored at minimum in accordance with the analytical method requirements.

General Chemistry:

No significant anomalies were noted with this analysis.

Approved by Noe D. Diaz Date 01/16/2020

Chain of Custody

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
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KZ000709

10450 Stancliff Rd, Ste 210
Houston, TX 77099
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F: +1 281 530 5887
www.alsglobal.com

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID:** **13053**

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:
Email:

INVOICE INFORMATION:

Company: ALS Houston
Contact: Accounts Payable
Address: 10450 Stancliff Rd, Ste 210
Phone: +1 281 530 5656
Reference: HS20010261
TSR: Danielle Winnings

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS20010261-01**	**LH18/24-SP650_010720**	**Water**	**07 Jan 2020 14:00**
	TOC Analysis for DOD Level IV			16 Jan 2020

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. [illegible] Date/Time: 01/08/20 18:00
Received By: [illegible] Date/Time: 1/9/20 0940
Cooler ID(s): Temperature(s):

PC KL

Cooler Receipt and Preservation Form

Client AIS Houston Service Request K2000299

Received: 1/9/20 Opened: 1/9/20 By: AP Unloaded: 1/9/20 By: AP

1. Samples were received via? *USPS* (*Fed Ex*) *UPS* *DHL* *PDX* *Courier* *Hand Delivered*
2. Samples were received in: (circle) (*Cooler*) *Box* *Envelope* *Other* _____ *NA*
3. Were custody seals on coolers? NA (Y) N If yes, how many and where? 1 Left 1 Right
   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
-0.8	-0.6	-0.1	0.1	0.2	401		1251 0293 5218	
						13053		
						13068		
						13065		

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

Sample ID on Bottle	Sample ID on COC	Identified by:

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

RUSH

Notes, Discrepancies, & Resolutions: _____

General Chemistry

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	K2000209
Project:	HS20010261	**Date Collected:**	01/7/20
Sample Matrix:	Water	**Date Received:**	01/9/20
Analysis Method:	SM 5310 C	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA

Carbon, Total Organic

Sample Name	Lab Code	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
LH18/24-SP650_010720	K2000209-001	**2.01**	0.50	0.20	0.07	1	01/14/20 22:45	
Method Blank	K2000209-MB	ND U	0.50	0.20	0.07	1	01/15/20 03:01	

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	K2000209
Project	HS20010261	**Date Collected:**	01/07/20
Sample Matrix:	Water	**Date Received:**	01/09/20
		Date Analyzed:	01/14/20

Replicate Sample Summary
General Chemistry Parameters

Sample Name:	LH18/24-SP650_010720	**Units:**	mg/L
Lab Code:	K2000209-001	**Basis:**	NA

Analyte Name	Analysis Method	LOQ	LOD	MDL	Sample Result	Duplicate Sample K2000209-001DUP Result	Average	RPD	RPD Limit
Carbon, Total Organic	SM 5310 C	0.50	0.20	0.07	2.01	2.08	2.05	3	10

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

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

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

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	K2000209
Project:	HS20010261	**Date Collected:**	01/07/20
Sample Matrix:	Water	**Date Received:**	01/09/20
		Date Analyzed:	01/14/20
		Date Extracted:	NA

Matrix Spike Summary
Carbon, Total Organic

Sample Name:	LH18/24-SP650_010720	**Units:**	mg/L
Lab Code:	K2000209-001	**Basis:**	NA
Analysis Method:	SM 5310 C		
Prep Method:	None		

Matrix Spike
K2000209-001MS

Analyte Name	Sample Result	Result	Spike Amount	% Rec	% Rec Limits
Carbon, Total Organic	2.01	26.8	25.0	99	83-117

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

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

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

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	K2000209
Project:	HS20010261	**Date Analyzed:**	01/15/20
Sample Matrix:	Water	**Date Extracted:**	NA

Lab Control Sample Summary
Carbon, Total Organic

Analysis Method:	SM 5310 C	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA
		Analysis Lot:	666572

Sample Name	Lab Code	Result	Spike Amount	% Rec	% Rec Limits
Lab Control Sample	K2000209-LCS	25.4	25.0	101	83-117

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US **Service Request:** K2000209
Project: HS20010261

Continuing Calibration Verification (CCV) Summary

Carbon, Total Organic

Analysis Method: SM 5310 C **Units:** mg/L

	Analysis Lot	Lab Code	Date Analyzed	True Value	Measured Value	Percent Recovery	Acceptance Limits
CCV1	666572	KQ2000580-01	01/14/20 21:47	25.0	24.5	98	90-110
CCV2	666572	KQ2000580-02	01/15/20 02:31	25.0	24.3	97	90-110
CCV3	666572	KQ2000580-03	01/15/20 07:01	25.0	24.3	97	90-110
CCV4	666572	KQ2000580-04	01/15/20 14:02	25.0	24.2	97	90-110
CCV5	666572	KQ2000580-05	01/15/20 16:51	25.0	24.0	96	90-110

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US **Service Request:**K2000209
Project: HS20010261

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	666572	KQ2000580-06	01/14/20 22:02	0.50	0.20	0.07	ND	U
CCB2	666572	KQ2000580-07	01/15/20 02:46	0.50	0.20	0.07	ND	U
CCB3	666572	KQ2000580-08	01/15/20 07:16	0.50	0.20	0.07	ND	U
CCB4	666572	KQ2000580-09	01/15/20 14:17	0.50	0.20	0.07	ND	U
CCB5	666572	KQ2000580-10	01/15/20 17:06	0.50	0.20	0.07	ND	U

Raw Data

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
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General Chemistry

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Work Request # Original ( ) K2000894, 317, 319, 65, 78, 229, 240, 247, 268, 337, 240

Tier: II II II II I I I II II I I

Date Analyzed: 1/14/2020

Analyst: BCD

Run # DOC: 666571 TOC: 666572, 666573

Analysis: TOC/DOC

DATA QUALITY REPORT
INORGANICS

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

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

COMMENTS: K2000268-1/ld, 229-Vld report a high %RSD. However, these samples are less than 5x the MRL.

Final Approved by: [signature] Date: 01/16/20

DQREPORT

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 666571 **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
K2000184-001	Carbon, Dissolved Organic (DOC)	N/A		Effluent	1.17 mg/L	10 mL	1.17 mg/L	1	0.07	0.50			1/14/20 20:23:00	N	II
K2000184-002	Carbon, Dissolved Organic (DOC)	N/A		Effluent	1.22 mg/L	10 mL	1.22 mg/L	1	0.07	0.50			1/14/20 20:51:00	N	II
K2000317-002	Carbon, Dissolved Organic (DOC)	N/A		Water	3.53 mg/L	10 mL	3.53 mg/L	1	0.07	0.50			1/14/20 21:19:00	N	II
K2000317-004	Carbon, Dissolved Organic (DOC)	N/A		Water	2.43 mg/L	10 mL	2.43 mg/L	1	0.07	0.50			1/14/20 22:17:00	N	II
K2000319-001	Carbon, Dissolved Organic	N/A		Water	3.44 mg/L	10 mL	3.44 mg/L	1	0.07	0.50			1/14/20 19:26:00	N	II
KQ2000581-01	Carbon, Dissolved Organic	MS	K2000319-001	Water	29.62 mg/L	10 mL	29.6 mg/L	1	0.07	0.50	105		1/14/20 19:54:00	N	II
KQ2000581-02	Carbon, Dissolved Organic	CCV		Water	24.41 mg/L	10 mL	24.4 mg/L	1					1/14/20 17:58:00	N	II
KQ2000581-02	Carbon, Dissolved Organic (DOC)	CCV		Water	24.41 mg/L	10 mL	24.4 mg/L	1					1/14/20 17:58:00	N	II
KQ2000581-03	Carbon, Dissolved Organic	CCV		Water	24.49 mg/L	10 mL	24.5 mg/L	1					1/14/20 21:47:00	N	II
KQ2000581-03	Carbon, Dissolved Organic (DOC)	CCV		Water	24.49 mg/L	10 mL	24.5 mg/L	1					1/14/20 21:47:00	N	II
KQ2000581-04	Carbon, Dissolved Organic	CCV		Water	24.29 mg/L	10 mL	24.3 mg/L	1					1/15/20 02:31:00	N	II
KQ2000581-04	Carbon, Dissolved Organic (DOC)	CCV		Water	24.29 mg/L	10 mL	24.3 mg/L	1					1/15/20 02:31:00	N	II
KQ2000581-05	Carbon, Dissolved Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			1/14/20 18:13:00	N	II
KQ2000581-05	Carbon, Dissolved Organic (DOC)	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			1/14/20 18:13:00	N	II
KQ2000581-06	Carbon, Dissolved Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			1/14/20 22:02:00	N	II
KQ2000581-06	Carbon, Dissolved Organic (DOC)	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			1/14/20 22:02:00	N	II
KQ2000581-07	Carbon, Dissolved Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			1/15/20 02:46:00	N	II
KQ2000581-07	Carbon, Dissolved Organic (DOC)	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			1/15/20 02:46:00	N	II
KQ2000581-08	Carbon, Dissolved Organic	MB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			1/14/20 18:28:00	N	II
KQ2000581-08	Carbon, Dissolved Organic (DOC)	MB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			1/14/20 18:28:00	N	II
KQ2000581-09	Carbon, Dissolved Organic	LCS		Water	25.26 mg/L	10 mL	25.3 mg/L	1	0.07	0.50	101		1/14/20 18:42:00	N	II
KQ2000581-09	Carbon, Dissolved Organic (DOC)	LCS		Water	25.26 mg/L	10 mL	25.3 mg/L	1	0.07	0.50	101		1/14/20 18:42:00	N	II
KQ2000581-10	Carbon, Dissolved Organic (DOC)	DUP	K2000184-001	Effluent	1.15 mg/L	10 mL	1.15 mg/L	1	0.07	0.50		1	1/14/20 20:23:00	N	II
KQ2000581-11	Carbon, Dissolved Organic (DOC)	DUP	K2000184-002	Effluent	1.23 mg/L	10 mL	1.23 mg/L	1	0.07	0.50		<1	1/14/20 20:51:00	N	II
KQ2000581-12	Carbon, Dissolved Organic (DOC)	DUP	K2000317-002	Water	3.53 mg/L	10 mL	3.53 mg/L	1	0.07	0.50		<1	1/14/20 21:19:00	N	II
KQ2000581-13	Carbon, Dissolved Organic (DOC)	DUP	K2000317-004	Water	2.35 mg/L	10 mL	2.35 mg/L	1	0.07	0.50		3	1/14/20 22:17:00	N	II
KQ2000581-14	Carbon, Dissolved Organic	DUP	K2000319-001	Water	3.47 mg/L	10 mL	3.47 mg/L	1	0.07	0.50		<1	1/14/20 19:26:00	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:** 666571 **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
KQ2000581-15	Carbon, Dissolved Organic (DOC)	N/A		Water	3.44 mg/L	10 mL	3.44 mg/L	1	0.07	0.50			1/14/20 19:26:00	N	II
KQ2000581-16	Carbon, Dissolved Organic (DOC)	MS	KQ2000581-15	Water	29.62 mg/L	10 mL	29.6 mg/L	1	0.07	0.50	105		1/14/20 19:54:00	N	II
KQ2000581-17	Carbon, Dissolved Organic (DOC)	DUP	KQ2000581-15	Water	3.47 mg/L	10 mL	3.47 mg/L	1	0.07	0.50		<1	1/14/20 19:26:00	N	II

01/16/20

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Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 666572 **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
K2000065-001	Carbon, Total Organic	N/A		Water	6.54 mg/L	10 mL	654 mg/L	100	7	50			1/14/20 23:42:00	N	II
K2000065-002	Carbon, Total Organic	N/A		Water	9.50 mg/L	10 mL	950 mg/L	100	7	50			1/15/20 00:10:00	N	II
K2000065-003	Carbon, Total Organic	N/A		Water	9.86 mg/L	10 mL	986 mg/L	100	7	50			1/15/20 00:38:00	N	II
K2000065-004	Carbon, Total Organic	N/A		Water	9.69 mg/L	10 mL	969 mg/L	100	7	50			1/15/20 01:06:00	N	II
K2000078-002	Carbon, Total Organic	N/A		Drinking Water	0.08 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			1/15/20 03:58:00	N	I
K2000209-001	Carbon, Total Organic	N/A		Water	2.01 mg/L	10 mL	2.01 mg/L	1	0.07	0.50			1/14/20 22:45:00	N	IV
K2000229-001	Carbon, Total Organic	N/A		Drinking Water	1.72 mg/L	10 mL	1.72 mg/L	1	0.07	0.50			1/15/20 01:35:00	N	I
K2000229-002	Carbon, Total Organic	N/A		Drinking Water	0.27 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			1/15/20 02:03:00	N	I
K2000240-005	Carbon, Total Organic	N/A		Water	0.93 mg/L	10 mL	47 mg/L	50	4	25			1/15/20 14:32:00	N	I
K2000247-003	Carbon, Total Organic	N/A		Water	4.23 mg/L	10 mL	4.23 mg/L	1	0.07	0.50			1/15/20 05:22:00	N	II
K2000268-001	Carbon, Total Organic	N/A		Water	0.57 mg/L	10 mL	0.57 mg/L	1	0.07	0.50			1/15/20 03:30:00	N	II
K2000317-001	Carbon, Total Organic	N/A		Water	3.48 mg/L	10 mL	3.48 mg/L	1	0.07	0.50			1/15/20 04:26:00	N	II
K2000317-003	Carbon, Total Organic	N/A		Water	2.44 mg/L	10 mL	2.44 mg/L	1	0.07	0.50			1/15/20 04:54:00	N	II
K2000319-001	Carbon, Total Organic	N/A		Water	4.61 mg/L	10 mL	4.61 mg/L	1	0.07	0.50			1/15/20 06:18:00	N	II
K2000337-002	Carbon, Total Organic	N/A		Drinking Water	1.48 mg/L	10 mL	1.48 mg/L	1	0.07	0.50			1/15/20 05:50:00	N	I
KQ2000580-01	Carbon, Total Organic	CCV		Water	24.49 mg/L	10 mL	24.5 mg/L	1					1/14/20 21:47:00	N	IV
KQ2000580-01	Carbon, Total Organic	CCV		Water	24.49 mg/L	10 mL	24.5 mg/L	1					1/14/20 21:47:00	N	IV
KQ2000580-02	Carbon, Total Organic	CCV		Water	24.29 mg/L	10 mL	24.3 mg/L	1					1/15/20 02:31:00	N	IV
KQ2000580-02	Carbon, Total Organic	CCV		Water	24.29 mg/L	10 mL	24.3 mg/L	1					1/15/20 02:31:00	N	IV
KQ2000580-03	Carbon, Total Organic	CCV		Water	24.31 mg/L	10 mL	24.3 mg/L	1					1/15/20 07:01:00	N	IV
KQ2000580-03	Carbon, Total Organic	CCV		Water	24.31 mg/L	10 mL	24.3 mg/L	1					1/15/20 07:01:00	N	IV
KQ2000580-04	Carbon, Total Organic	CCV		Water	24.23 mg/L	10 mL	24.2 mg/L	1					1/15/20 14:02:00	N	IV
KQ2000580-04	Carbon, Total Organic	CCV		Water	24.23 mg/L	10 mL	24.2 mg/L	1					1/15/20 14:02:00	N	IV
KQ2000580-05	Carbon, Total Organic	CCV		Water	24.03 mg/L	10 mL	24.0 mg/L	1					1/15/20 16:51:00	N	IV
KQ2000580-05	Carbon, Total Organic	CCV		Water	24.03 mg/L	10 mL	24.0 mg/L	1					1/15/20 16:51:00	N	IV
KQ2000580-06	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			1/14/20 22:02:00	N	IV
KQ2000580-06	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			1/14/20 22:02:00	N	IV
KQ2000580-07	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			1/15/20 02:46:00	N	IV
KQ2000580-07	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			1/15/20 02:46:00	N	IV
KQ2000580-08	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			1/15/20 07:16:00	N	IV
KQ2000580-08	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			1/15/20 07:16:00	N	IV
KQ2000580-09	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			1/15/20 14:17:00	N	IV
KQ2000580-09	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			1/15/20 14:17:00	N	IV
KQ2000580-10	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			1/15/20 17:06:00	N	IV

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

01/16/20

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 666572 **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
KQ2000580-10	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			1/15/20 17:06:00	N	IV
KQ2000580-11	Carbon, Total Organic	MB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			1/15/20 03:01:00	N	IV
KQ2000580-11	Carbon, Total Organic	MB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			1/15/20 03:01:00	N	IV
KQ2000580-12	Carbon, Total Organic	LCS		Water	25.36 mg/L	10 mL	25.4 mg/L	1	0.07	0.50	101		1/15/20 03:15:00	N	IV
KQ2000580-12	Carbon, Total Organic	LCS		Water	25.36 mg/L	10 mL	25.4 mg/L	1	0.07	0.50	101		1/15/20 03:15:00	N	IV
KQ2000580-13	Carbon, Total Organic	MS	K2000209-001	Water	26.81 mg/L	10 mL	26.8 mg/L	1	0.07	0.50	99		1/14/20 23:13:00	N	IV
KQ2000580-14	Carbon, Total Organic	DUP	K2000337-002	Drinking Water	1.46 mg/L	10 mL	1.46 mg/L	1	0.07	0.50		2	1/15/20 05:50:00	N	I
KQ2000580-16	Carbon, Total Organic	DUP	K2000268-001	Water	0.48 mg/L	10 mL	0.48 mg/L J	1	0.07	0.50		16*	1/15/20 03:30:00	N	II
KQ2000580-17	Carbon, Total Organic	DUP	K2000065-004	Water	9.73 mg/L	10 mL	973 mg/L	100	7	50		<1	1/15/20 01:06:00	N	II
KQ2000580-18	Carbon, Total Organic	DUP	K2000229-001	Drinking Water	1.45 mg/L	10 mL	1.45 mg/L	1	0.07	0.50		17*	1/15/20 01:35:00	N	I
KQ2000580-19	Carbon, Total Organic	DUP	K2000229-002	Drinking Water	0.35 mg/L	10 mL	0.35 mg/L J	1	0.07	0.50		NC	1/15/20 02:03:00	N	I
KQ2000580-20	Carbon, Total Organic	DUP	K2000065-001	Water	6.64 mg/L	10 mL	664 mg/L	100	7	50		2	1/14/20 23:42:00	N	II
KQ2000580-21	Carbon, Total Organic	DUP	K2000078-002	Drinking Water	0.04 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	1/15/20 03:58:00	N	I
KQ2000580-22	Carbon, Total Organic	DUP	K2000317-001	Water	3.41 mg/L	10 mL	3.41 mg/L	1	0.07	0.50		2	1/15/20 04:26:00	N	II
KQ2000580-23	Carbon, Total Organic	DUP	K2000319-001	Water	4.69 mg/L	10 mL	4.69 mg/L	1	0.07	0.50		2	1/15/20 06:18:00	N	II
KQ2000580-24	Carbon, Total Organic	DUP	K2000317-003	Water	2.40 mg/L	10 mL	2.40 mg/L	1	0.07	0.50		2	1/15/20 04:54:00	N	II
KQ2000580-25	Carbon, Total Organic	DUP	K2000065-002	Water	9.55 mg/L	10 mL	955 mg/L	100	7	50		<1	1/15/20 00:10:00	N	II
KQ2000580-26	Carbon, Total Organic	DUP	K2000240-005	Water	0.91 mg/L	10 mL	46 mg/L	50	4	25		2	1/15/20 14:32:00	N	I
KQ2000580-27	Carbon, Total Organic	DUP	K2000247-003	Water	4.30 mg/L	10 mL	4.30 mg/L	1	0.07	0.50		2	1/15/20 05:22:00	N	II
KQ2000580-28	Carbon, Total Organic	DUP	K2000209-001	Water	2.08 mg/L	10 mL	2.08 mg/L	1	0.07	0.50		3	1/14/20 22:45:00	N	IV
KQ2000580-29	Carbon, Total Organic	DUP	K2000065-003	Water	9.77 mg/L	10 mL	977 mg/L	100	7	50		<1	1/15/20 00:38:00	N	II
KQ2000580-30	Carbon, Total Organic	N/A		Water	2.01 mg/L	10 mL	2.01 mg/L	1	0.07	0.50			1/14/20 22:45:00	N	I
KQ2000580-31	Carbon, Total Organic	MS	KQ2000580-30	Water	26.81 mg/L	10 mL	26.8 mg/L	1	0.07	0.50	99		1/14/20 23:13:00	N	I
KQ2000580-32	Carbon, Total Organic	DUP	KQ2000580-30	Water	2.08 mg/L	10 mL	2.08 mg/L	1	0.07	0.50		3	1/14/20 22:45:00	N	I

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

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 666573 **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
K2000240-005	Carbon, Total Organic (TOC)	N/A		Water	0.90 mg/L	10 mL	45 mg/L	50		25			1/15/20 15:00:00	N	I
KQ2000583-16	Carbon, Total Organic (TOC)	CCV		Water	24.31 mg/L	10 mL	24.3 mg/L	1					1/15/20 07:01:00	N	I
KQ2000583-17	Carbon, Total Organic (TOC)	CCV		Water	24.23 mg/L	10 mL	24.2 mg/L	1					1/15/20 14:02:00	N	I
KQ2000583-18	Carbon, Total Organic (TOC)	CCV		Water	24.03 mg/L	10 mL	24.0 mg/L	1					1/15/20 16:51:00	N	I
KQ2000583-19	Carbon, Total Organic (TOC)	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1		0.50			1/15/20 07:16:00	N	I
KQ2000583-20	Carbon, Total Organic (TOC)	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1		0.50			1/15/20 14:17:00	N	I
KQ2000583-21	Carbon, Total Organic (TOC)	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1		0.50			1/15/20 17:06:00	N	I
KQ2000583-22	Carbon, Total Organic (TOC)	MB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1		0.50			1/15/20 12:11:00	N	I
KQ2000583-23	Carbon, Total Organic (TOC)	LCS		Water	25.09 mg/L	10 mL	25.1 mg/L	1		0.50	100		1/15/20 13:07:00	N	I
KQ2000583-24	Carbon, Total Organic (TOC)	MB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1		0.50			1/15/20 12:11:00	N	I
KQ2000583-25	Carbon, Total Organic (TOC)	MB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1		0.50			1/15/20 12:11:00	N	I
KQ2000583-26	Carbon, Total Organic (TOC)	MB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1		0.50			1/15/20 12:11:00	N	I
KQ2000583-27	Carbon, Total Organic (TOC)	LCS		Water	25.05 mg/L	10 mL	25.0 mg/L	1		0.50	100		1/15/20 13:07:00	N	I
KQ2000583-28	Carbon, Total Organic (TOC)	LCS		Water	25.08 mg/L	10 mL	25.1 mg/L	1		0.50	100		1/15/20 13:07:00	N	I
KQ2000583-29	Carbon, Total Organic (TOC)	LCS		Water	25.08 mg/L	10 mL	25.1 mg/L	1		0.50	100		1/15/20 13:07:00	N	I
KQ2000583-30	Carbon, Total Organic (TOC)	DUP	K2000240-005	Water	0.88 mg/L		44 mg/L	50		25		2	1/15/20 15:00:00	N	I
KQ2000583-31	Carbon, Total Organic (TOC)	TRP	K2000240-005	Water	0.85 mg/L		43 mg/L	50		25		3	1/15/20 15:00:00	N	I
KQ2000583-32	Carbon, Total Organic (TOC)	QUAD	K2000240-005	Water	0.91 mg/L		45 mg/L	50		25		3	1/15/20 15:00:00	N	I

01/16/20

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

DOC: 666571
TOC: 666572, 666573

Schedule: 01142020

Version: 8
Instrument: Fusion1
Last Saved by: Fusion1 (Fusion1)
Last Saved on: 2020/01/15 12:26 - Wednesday

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)	1	True	Ready
C	Check Standard	[TOC] LCS [24.0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
2	Sample	ICS	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
3	Sample	FB 1/14/2020	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
4	Sample	K2000319-001.08 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
5	Sample	K2000319-001.08 ms doc	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
6	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
7	Sample	K2000184-001.03 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
8	Sample	K2000184-002.03 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
9	Sample	K2000317-002.02 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
10	Sample	K2000317-004.02 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
11	Sample	K2000209-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
12	Sample	K2000209-001.01 ms	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
13	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
14	Sample	K2000065-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
15	Sample	K2000065-002.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
16	Sample	K2000065-003.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
17	Sample	K2000065-004.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
18	Sample	K2000229-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
19	Sample	K2000229-002.01	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
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	K2000268-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
22	Sample	K2000078-002.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
23	Sample	K2000317-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
24	Sample	K2000317-003.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
25	Sample	K2000247-003.04	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
26	Sample	K2000337-002.07	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
27	Sample	K2000319-001.28	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
28	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
29	Sample	LOD	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
30	Sample	LOQ	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
31	Sample	K2000240-005.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
32	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
33	Sample	LOD	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
34	Sample	LOQ	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
35	Sample	K2000240-005.01 100x	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
36	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
37	Sample	MB3	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
C	Check Standard	[TOC] LCS [25.0 ppm]	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

01/16/20

Schedule: 01142020

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
38	Sample	K2000240-005.01 50x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
39	Sample	K2000240-005.01 50x	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
40	Sample	LOQ	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
					False	

Fusion Report - 01142020
Tuesday, January 14, 2020 04:04 PM

(View - Reps, Unused Reps, Meta-Data, Signature, History)
Printed on 2020/01/16 09:08 - Thursday

Report Summary Information

Company Location:	Gen Chem Lab		
Schedule Name:	01142020	Engine Version:	1.1.5.1
Instrument Name:	Fusion1	Firmware Version:	1.2.0696
Report Version:	1 of 1	Connection:	RS232 COM1
Report Creation by Operators (schedule version):	Fusion1 (Fusion1) (v2) Fusion1 (Fusion1) (v3) Fusion1 (Fusion1) (v4) Fusion1 (Fusion1) (v6) Fusion1 (Fusion1) (v7) Fusion1 (Fusion1) (v8)		
Comment:			

Report Results

01/16/20

Sample Type: Clean — From Schedule Version 2

	Pos	Analysis Type	Sample ID	Start Time
◆	(clean)		Clean	2020/01/14 16:04

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	14.79	18.81	4.01	49.44	05:22
2	TC Clean	26.79	30.58	3.80	49.96	04:01
3	TC Clean	4.26	8.15	3.89	49.98	03:54
4	TC Clean	2.76	6.68	3.92	50.04	03:53

Sample Type: Clean — From Schedule Version 3

	Pos	Analysis Type	Sample ID	Start Time
◆	(clean)		Clean	2020/01/14 16:26

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	1.24	4.93	3.69	49.47	05:20
2	TC Clean	6.59	10.38	3.79	50.12	04:03

3	TC Clean	2.91	6.63	3.72	50.07	03:47
4	TC Clean	2.63	6.46	3.82	50.09	03:52

Sample Type: Clean From Schedule Version 4

	Pos	Analysis Type	Sample ID	Start Time
◈	(clean)		Clean	2020/01/14 16:48

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	9.99	13.73	3.75	49.51	05:24
2	TC Clean	6.38	10.11	3.73	49.96	04:04
3	TC Clean	2.59	6.49	3.89	50.06	03:47
4	TC Clean	1.87	5.68	3.81	50.10	03:48

Sample Type: Blank (Creating v1341) From Schedule Version 6

	Pos	Analysis Type	Sample ID	Start Time
◈	(blank)		Reagent/Acid Blank	2020/01/14 17:10

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	0.95	4.92	3.97	49.63	05:22
2	TC Clean	5.33	9.30	3.97	50.02	04:00
3	TC Clean	2.20	6.24	4.04	50.03	03:43
4	TC Clean	2.08	5.94	3.86	50.14	03:47
5	Reagent Blank	4.46	8.47	4.00	50.13	05:05
6	Acid Blank	1.70	5.47	3.78	49.48	05:29

Sample Type: Sample From Schedule Version 6

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	D	TOC	RB	0.1881 ppm	0.0000 ppm	0.0000%	2020/01/14 17:43

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.1881	1.8812	10.67	14.76	4.09	50.17	10:32

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.4776 (IC) (v1341)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

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)	24.4070 ppm (PASS)	0.0000 ppm	0%	2020/01/14 17:58

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.4070	244.0695	164.52	168.52	4.00	50.14	10:33

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)	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%	2020/01/14 18:13

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	8.42	12.14	3.72	50.14	10:30

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)	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%	2020/01/14 18:28

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.51	11.30	3.79	50.15	10:33

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.4776 (IC) (v1341)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

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)	25.2608 ppm (PASS)	0.0000 ppm	0%	2020/01/14 18:42

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	25.2608	252.6084	169.92	173.61	3.69	50.16	10:34

Completion State	Success Action	Method	Calibration	STD Conc - Pos C
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)	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	0.0249 ppm	0.0000 ppm	0.0000%	2020/01/14 18:57

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0249	0.2490	9.64	13.39	3.76	50.15	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.4776 (IC) (v1341)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	3	TOC	FB 1/14/2020	0.0000 ppm	0.0000 ppm	0.0000%	2020/01/14 19:12

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.70	11.41	3.71	50.13	10:33

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.4776 (IC) (v1341)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	4	TOC	K2000319-001.08 doc	3.4520 ppm	0.0215 ppm	0.6200%	2020/01/14 19:26

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.4368	34.3682	31.21	35.07	3.87	50.15	10:32
2	TOC	3.4672	34.6719	31.40	34.98	3.58	50.14	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.4776 (IC) (v1341)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	5	TOC	K2000319-001.08 ms doc	29.6248 ppm	0.0000 ppm	0.0000%	2020/01/14 19:54

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	29.6248	296.2479	196.79	200.58	3.79	50.12	10:31

Dilution	Blank Contribution	Method	Calibration

1:10	(TC) 9.4776 (IC) (v1341)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	6	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2020/01/14 20:09

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	8.24	11.88	3.64	50.14	10:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.4776 (IC) (v1341)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	7	TOC	K2000184-001.03 doc	1.1587 ppm	0.0103 ppm	0.8900%	2020/01/14 20:23

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.1660	11.6600	16.85	20.57	3.72	50.11	10:27
2	TOC	1.1515	11.5145	16.76	20.47	3.71	50.09	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.4776 (IC) (v1341)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	8	TOC	K2000184-002.03 doc	1.2253 ppm	0.0025 ppm	0.2000%	2020/01/14 20:51

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.2236	12.2357	17.21	20.87	3.65	50.08	10:30
2	TOC	1.2271	12.2705	17.24	20.76	3.53	50.07	10:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.4776 (IC) (v1341)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	9	TOC	K2000317-002.02 doc	3.5265 ppm	0.0007 ppm	0.0200%	2020/01/14 21:19

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.5270	35.2697	31.78	35.31	3.53	50.05	10:26
2	TOC	3.5260	35.2602	31.77	35.48	3.71	50.04	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.4776 (IC) (v1341)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

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)	24.4920 ppm (PASS)	0.0000 ppm	0%	2020/01/14 21:47

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.4920	244.9204	165.06	168.69	3.63	50.01	10:28

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)	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%	2020/01/14 22:02

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	7.75	11.36	3.61	50.00	10:30

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)	0 ppmC

Sample Type: Sample From Schedule Version 6

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	10	TOC	K2000317-004.02 doc	2.3925 ppm	0.0561 ppm	2.3500%	2020/01/14 22:17

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.4322	24.3221	24.86	28.42	3.56	49.99	10:28
2	TOC	2.3528	23.5281	24.35	28.10	3.74	50.01	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.4776 (IC) (v1341)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	11	TOC	K2000209-001.01	2.0458 ppm	0.0438 ppm	2.1400%	2020/01/14 22:45

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.0148	20.1483	22.22	25.84	3.63	49.98	10:30
2	TOC	2.0768	20.7683	22.61	26.32	3.71	49.97	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.4776 (IC) (v1341)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	12	TOC	K2000209-001.01 ms	26.8050 ppm	0.0000 ppm	0.0000%	2020/01/14 23:13

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	26.8050	268.0501	178.96	182.61	3.65	49.98	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.4776 (IC) (v1341)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	13	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2020/01/14 23:28

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	8.24	12.01	3.77	49.95	10:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.4776 (IC) (v1341)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	14	TOC	K2000065-001.01	6.5912 ppm	0.0753 ppm	1.1400%	2020/01/14 23:42

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	6.5380	65.3797	50.82	54.35	3.53	49.98	10:27
2	TOC	6.6444	66.4441	51.49	55.10	3.61	49.95	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.4776 (IC) (v1341)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	15	TOC	K2000065-002.01	9.5284 ppm	0.0353 ppm	0.3700%	2020/01/15 00:10

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	9.5034	95.0341	69.57	73.29	3.72	49.96	10:27
2	TOC	9.5534	95.5339	69.88	73.64	3.75	49.96	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.4776 (IC) (v1341)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	16	TOC	K2000065-003.01	9.8163 ppm	0.0607 ppm	0.6200%	2020/01/15 00:38

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	9.8593	98.5926	71.82	75.51	3.70	49.97	10:31
2	TOC	9.7734	97.7339	71.27	74.75	3.48	49.97	10:26

Dilution	Blank Contribution	Method	Calibration

1:10	(TC) 9.4776 (IC) (v1341)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	17	TOC	K2000065-004.01	9.7083 ppm	0.0310 ppm	0.3200%	2020/01/15 01:06

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	9.6864	96.8640	70.72	74.37	3.65	49.96	10:26
2	TOC	9.7302	97.3021	71.00	74.60	3.60	49.96	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.4776 (IC) (v1341)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	18	TOC	K2000229-001.01	1.5873 ppm	0.1943 ppm	12.2400%	2020/01/15 01:35

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.7246	17.2461	20.38	23.97	3.58	49.94	10:26
2	TOC	1.4499	14.4989	18.64	22.33	3.68	49.95	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.4776 (IC) (v1341)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	19	TOC	K2000229-002.01	0.3067 ppm	0.0547 ppm	17.8300%	2020/01/15 02:03

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.2680	2.6799	11.17	14.92	3.75	49.94	10:24
2	TOC	0.3453	3.4533	11.66	15.22	3.56	49.95	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.4776 (IC) (v1341)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

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)	24.2871 ppm (PASS)	0.0000 ppm	0%	2020/01/15 02:31

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.2871	242.8707	163.76	167.36	3.59	49.94	10:34

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)	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%	2020/01/15 02:46

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	6.95	10.86	3.91	49.94	10:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)	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%	2020/01/15 03:01

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.77	10.48	3.71	49.94	10:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.4776 (IC) (v1341)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

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)	25.3551 ppm (PASS)	0.0000 ppm	0%	2020/01/15 03:15

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	25.3551	253.5511	170.52	174.14	3.62	49.94	10:27

Completion State	Success Action	Method	Calibration	STD Conc - Pos C
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)	25 ppmC

Sample Type: Sample

From Schedule Version 6

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	21	TOC	K2000268-001.01	0.5237 ppm	0.0611 ppm	11.6600%	2020/01/15 03:30

Rep	Base			Adjusted		Baseline	Pressure	Run

#	Analysis Type	ppm	µg	(Abs)	NDIR (Abs)	(Abs)	(psig)	Time
1	TOC	0.5669	5.6690	13.06	16.88	3.82	49.94	10:27
2	TOC	0.4805	4.8055	12.52	16.32	3.80	49.92	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.4776 (IC) (v1341)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	22	TOC	K2000078-002.01	0.0584 ppm	0.0262 ppm	44.7900%	2020/01/15 03:58

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0769	0.7693	9.96	13.63	3.67	49.93	10:27
2	TOC	0.0399	0.3992	9.73	13.52	3.79	49.93	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.4776 (IC) (v1341)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	23	TOC	K2000317-001.01	3.4464 ppm	0.0531 ppm	1.5400%	2020/01/15 04:26

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.4840	34.8395	31.51	35.22	3.71	49.91	10:31
2	TOC	3.4088	34.0883	31.03	34.71	3.68	49.93	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.4776 (IC) (v1341)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	24	TOC	K2000317-003.01	2.4196 ppm	0.0266 ppm	1.1000%	2020/01/15 04:54

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.4384	24.3838	24.90	28.42	3.53	49.91	10:31
2	TOC	2.4007	24.0073	24.66	28.33	3.68	49.92	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.4776 (IC) (v1341)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	25	TOC	K2000247-003.04	4.2655 ppm	0.0516 ppm	1.2100%	2020/01/15 05:22

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.2290	42.2903	36.22	39.96	3.75	49.92	10:29
2	TOC	4.3019	43.0194	36.68	40.27	3.59	49.93	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.4776 (IC) (v1341)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.4829	14.8295	18.85	22.38	3.53	49.93	10:26
2	TOC	1.4589	14.5891	18.70	22.42	3.72	49.93	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.4776 (IC) (v1341)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	27	TOC	K2000319-001.28	4.6499 ppm	0.0620 ppm	1.3300%	2020/01/15 06:18

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.6061	46.0608	38.60	42.28	3.68	49.94	10:26
2	TOC	4.6937	46.9370	39.15	42.80	3.65	49.94	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.4776 (IC) (v1341)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	28	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2020/01/15 06:46

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.04	10.76	3.72	49.94	10:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.4776 (IC) (v1341)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

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)	24.3060 ppm (PASS)	0.0000 ppm	0%	2020/01/15 07:01

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.3060	243.0605	163.88	167.66	3.78	49.92	10:33

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)	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%	2020/01/15 07:16

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	7.15	10.84	3.69	49.92	10:35

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)	0 ppmC

Sample Type: Sample From Schedule Version 6

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	29	TOC	LOD	0.0000 ppm	0.0000 ppm	0.0000%	2020/01/15 07:30

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	9.17	12.92	3.75	49.92	10:32

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.4776 (IC) (v1341)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	30	TOC	LOQ	0.8562 ppm	0.0000 ppm	0.0000%	2020/01/15 07:45

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.8562	8.5617	14.89	18.72	3.83	49.92	10:32

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.4776 (IC) (v1341)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	31	TOC	K2000240-005.01	80.0208 ppm	0.2313 ppm	0.2900%	2020/01/15 08:00

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	79.8572	798.5722	514.40	518.26	3.86	49.90	10:30
2	TOC	80.1843	801.8429	516.47	520.34	3.87	49.91	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.4776 (IC) (v1341)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	32	TOC	RB	0.0450 ppm	0.0637 ppm	141.4200%	2020/01/15 08:28

Rep	Base			Adjusted		Baseline	Pressure	Run

#	Analysis Type	ppm	µg	(Abs)	NDIR (Abs)	(Abs)	(psig)	Time
1	TOC	0.0901	0.9006	10.05	13.99	3.94	49.93	10:31
2	TOC	0.0000	0.0000	7.27	11.09	3.82	49.92	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.4776 (IC) (v1341)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	33	TOC	LOD	0.0113 ppm	0.0227 ppm	200.0000%	2020/01/15 08:56

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0453	0.4530	9.76	13.48	3.71	49.93	10:27
2	TOC	0.0000	0.0000	9.27	12.99	3.73	49.90	10:30
3	TOC	0.0000	0.0000	9.17	12.83	3.66	49.88	10:25
4	TOC	0.0000	0.0000	9.41	13.08	3.67	49.91	10:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.4776 (IC) (v1341)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

Sample Type: Sample From Schedule Version 7

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	34	TOC	LOQ	0.8547 ppm	0.0119 ppm	1.3900%	2020/01/15 09:51

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.8516	8.5159	14.86	18.46	3.60	49.88	10:26
2	TOC	0.8429	8.4289	14.81	18.45	3.65	49.90	10:28
3	TOC	0.8532	8.5317	14.87	18.42	3.54	49.92	10:26
4	TOC	0.8712	8.7120	14.99	18.51	3.52	49.89	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.4776 (IC) (v1341)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	35	TOC	K2000240-005.01 100x	0.4544 ppm	0.0365 ppm	8.0300%	2020/01/15 10:47

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.4663	4.6632	12.43	15.90	3.47	49.91	10:31
2	TOC	0.4094	4.0938	12.07	15.86	3.79	49.89	10:25
3	TOC	0.4458	4.4576	12.30	16.09	3.80	49.94	10:30
4	TOC	0.4962	4.9621	12.62	16.40	3.79	49.91	10:32

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.4776 (IC) (v1341)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

		Analysis			Std. Dev.		

	Pos	Type	Sample ID	Result (ppmC)	(ppmC)	RSD	Start Time
◆	36	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2020/01/15 11:43

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.12	9.88	3.76	49.93	10:26
2	TOC	0.0000	0.0000	6.07	9.88	3.80	49.95	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.4776 (IC) (v1341)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	37	TOC	MB3	0.0000 ppm	0.0000 ppm	0.0000%	2020/01/15 12:11

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	5.89	9.64	3.74	49.96	10:30
2	TOC	0.0000	0.0000	5.74	9.45	3.71	49.98	10:29
3	TOC	0.0000	0.0000	5.95	9.66	3.71	50.03	10:28
4	TOC	0.0000	0.0000	5.88	9.57	3.69	50.03	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.4776 (IC) (v1341)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

Sample Type: Check Standard --> LCS

From Schedule Version 8

	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)	25.0748 ppm (PASS)	0.0192 ppm	0.08%	2020/01/15 13:07

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	25.0888	250.8877	168.83	172.36	3.53	50.07	10:27
C	TOC	25.0 ppm	2	25.0465	250.4654	168.56	172.23	3.66	50.06	10:26
C	TOC	25.0 ppm	3	25.0837	250.8371	168.80	172.54	3.74	50.08	10:26
C	TOC	25.0 ppm	4	25.0802	250.8023	168.78	172.53	3.75	50.06	10:25

Completion State	Success Action	Method	Calibration	STD Conc - Pos C
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)	25 ppmC

Sample Type: Check Standard --> CCV 25 ppm

From Schedule Version 8

	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)	24.2316 ppm (PASS)	0.0000 ppm	0%	2020/01/15 14:02

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.2316	242.3156	163.41	167.07	3.65	50.06	10:29

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)	50 ppmC

Sample Type: Check Standard --> CCB From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2020/01/15 14:17

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	6.81	10.49	3.68	50.07	10:34

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)	0 ppmC

Sample Type: Sample From Schedule Version 8

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	38	TOC	K2000240-005.01 50x	0.9213 ppm	0.0131 ppm	1.4200%	2020/01/15 14:32

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.9305	9.3051	15.36	18.98	3.62	50.07	10:26
2	TOC	0.9120	9.1200	15.24	18.92	3.68	50.07	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.4776 (IC) (v1341)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	39	TOC	K2000240-005.01 50x	0.8847 ppm	0.0249 ppm	2.8100%	2020/01/15 15:00

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.8986	8.9856	15.16	18.68	3.52	50.06	10:30
2	TOC	0.8778	8.7784	15.03	18.75	3.73	50.08	10:30
3	TOC	0.8530	8.5301	14.87	18.49	3.62	50.09	10:30
4	TOC	0.9095	9.0947	15.23	18.78	3.55	50.11	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.4776 (IC) (v1341)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	40	TOC	LOQ	0.4239 ppm	0.0144 ppm	3.3900%	2020/01/15 15:56

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.4114	4.1143	12.08	15.74	3.66	50.11	10:28
2	TOC	0.4295	4.2946	12.19	15.97	3.77	50.08	10:26
3	TOC	0.4416	4.4164	12.27	15.94	3.67	50.11	10:28
4	TOC	0.4130	4.1302	12.09	15.91	3.82	50.12	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.4776 (IC) (v1341)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 8

	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)	24.0347 ppm (PASS)	0.0000 ppm	0%	2020/01/15 16:51

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.0347	240.3465	162.17	165.80	3.63	50.10	10:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)	50 ppmC

Sample Type: Check Standard --> CCB From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2020/01/15 17:06

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	6.62	10.31	3.70	50.13	10:30

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)	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
v1340	1.7500	1.0880	0.0000	0.0000	0.0000	2020/01/08 16:22	Fusion1 (Fusion1)
v1341	1.4877	1.6960	0.0000	0.0000	0.0000	2020/01/14 17:43	Fusion1 (Fusion1)

Calibrations

Name: CAS_salt_010711 (TOC)

Version: v31

Ver Creation: 2020/01/07 14:30

Comment:

Operator: Fusion1 (Fusion1)

Basic Analysis Type: TOC

Calibration curve formula: TOC: y = 6.323x + 10.200

r^2 value: TOC: r^2 = 0.99991

Basic Analysis Type: TOC

Sample ID	Y Raw Value	X Expected	Message	End Time
DI Water	9.5850	0.0000		2020/01/07 13:02
0.500 ppm	12.6160	0.5000		2020/01/07 13:17
1.0 ppm	15.6440	1.0000		2020/01/07 13:31
5.0 ppm	43.7700	5.0000		2020/01/07 13:45
10 ppm	73.2770	10.0000		2020/01/07 14:00
25 ppm	169.4210	25.0000		2020/01/07 14:14
50 ppm	325.6260	50.0000		2020/01/07 14:28

Methods

Name: CAS_salt_010711 (TOC)

Version: v4

Ver Creation: 2019/02/21 17:57

Comment:

Operator: Fusion1 (Fusion1)

Parameter	Value
SampleVolume	10.0 mL
Dilution	1:10
AcidVolume	0.5 ml
ReagentVolume	2.0 ml
UVReactorPrerinse	Off
UVReactorPrerinseVolume	5.0
NumberOfUVReactorPrerinses	1
ICSpargeTime	1.00 mins
DetectorSweepFlow	500 ml/min
PreSpargeTime	2.00 mins
SystemFlow	500 ml/min

Advanced Parameter	Value
NeedleRinseVolume	5.0 ml
VialPrimeVolume	2.0 ml
ICSamplePrimeVolume	2.0 ml
ICSpargeRinseVolume	12.0 ml
BaselineStabilizeTime	0.70 min
DetectorPressureFlow	150 ml/min
SyringeSpeedWaste	10
SyringeSpeedAcid	7
SyringeSpeedReagent	7
SyringeSpeedDIWater	7
NDIRPressurization	60 psig

SyringeSpeedSampleDispense	5
SyringeSpeedSampleAspirate	4
SyringeSpeedUVDispense	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	2020/01/15 17:21

StarLIMS Run: 666571, 666572, 666573

Analysis: DOC/TOC

Method: SM 5310 C, 9060A, 415.1, 9060

CCV: 11-GEN-05-82C 50 ppm LCS: 11-GEN-05-79J 25.0 ppm

ICAL Date: 1/7/2020

ICAL ID: 11-GEN-05-76H

ICS ID: 11-GEN-05-78M

ICS TV: 25.0 ppm ICS % R < 1

Spike ID: 11-GEN-05-82C 0.05 ml of 5000 ppm stock ---> 10.0 ml = 25.0 ppm x dilution factor

Sodium Persulfate: 11-GEN-05-83J

21 % H3PO4: 19-GEN-08-1-B

Equipment ID: K-TOC-03

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

FILTER ID: 16967789

Analyzed By: RKD	Date Analyzed: 1/14/2020
Reviewed By: [signature]	Date Reviewed: 01/16/20

Case Narrative

Method: 6850
Analysis: Perchlorate
Analysis SOP: LC-MS-CLO4
ALS WO ID(s): 2000307; 2000949; 2000952; 2000953

Client: ALS Laboratories (Houston, TX)
Matrix: Water
ELMS Batch (HBN): 2340 (255305)

General Set Information: There were four 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. 50µL 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 0.45µm Syringe filters.

Holding Times: Holding times were met for all analyses.

Dilutions: Field sample 2000952001 was analyzed and reported from a 1:1,000 dilution. The reporting limit has been adjusted accordingly.

Method QC data: The method blank (LMB 691930) was less than 1/2 the CRDL. The recovery for the LCS (692062) was within acceptable parameters.

MS/MSD Analysis: MS/MSD was performed on sample 2000307001 (Client ID: LH24-SP650_1230.19_BIX). 3.0µL of Working Standard Solution Horizon ID 49947 was added to 10.0mL of sample preparation. The spike target was 3.µg/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 µg/L. Results were calculated in µg/L by the equation (A)x(B),

where: A = Analyte concentration from the standard curve (µg/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 – 691929) is reported from the analysis of the Laboratory Control Sample (LCS – 692062) at a level of 3.0µg/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 15, 2020
Analyst Date

ANALYTICAL REPORT

Report Date: January 15, 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: **34-2000949**
Project ID: HS20010261-02
Purchase Order: HS20010261-02
Project Manager Kevin W. Griffiths

Client Sample ID	Lab ID	Collect Date	Receive Date	Sampling Site
LH18/24-SP650_010720_BIX Water	2000949001	01/07/20	01/09/20	HS20010261-02

ANALYTICAL REPORT

Workorder: 34-2000949
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: **LH18/24-SP650_010720_BIX Water**
Lab ID: 2000949001
Matrix: Water
Sampling Site: HS20010261-02
Media: 125 mL Nalgene
Sampling Parameter: NA
Collected: 01/07/2020
Received: 01/09/2020

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water
Batch: ELMS/2340 (HBN: 255305)
Analyzed: 01/15/2020 10:50
Instrument ID: LCMS04
%Solids: NA
Report Basis: Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	2.0	1.0	2.0	4.0	1	J

Comments

Quality Control: EPA 6850, DoD QSM - (HBN: 255305)

Field sample 2000952001 was analyzed and reported from a 1:1,000 dilution. The reporting limit has 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 01/15/2020 13:34	/S/ Stephen Brose 01/15/2020 14:31

Laboratory Contact Information

ALS Environmental
960 W Levoy Drive
Salt Lake City, Utah 84123

Phone: (801) 266-7700
Email: alslt.lab@ALSGlobal.com
Web: www.alsslc.com

ANALYTICAL REPORT

Workorder: 34-2000949
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

Analysis Information

Workorder: 2000949

Limits:	Client SOW/Contract Specified	**Preparation:**	NA	**Analysis:**	EPA 6850, DoD QSM
Basis:	DoD QSM	**Batch:**	NA	**Batch:**	ELMS/2340 (HBN: 255305)
		Prepared By:	NA	**Analyzed By:**	Thomas Bosch

Blank

LMB: 691930
Analyzed: 01/15/2020 09:54
Units: ug/L

Analyte	Result	MDL	RL
Perchlorate	ND	1	2.00

Laboratory Control Sample

LCS: 692062
Analyzed: 01/15/2020 09:26
Dilution: 1
Units: ug/L

Analyte	Result	Target	% Rec	QC Limits	
Perchlorate	3.29	3.00	110	78.8	123.8

Matrix Spike - Matrix Spike Duplicate

Sample:	2000307001	**MS:**	691932	**MSD:**	691933
Analyzed:	01/15/2020 10:08	**Analyzed:**	01/15/2020 10:22	**Analyzed:**	01/15/2020 10:36
Dilution:	1	**Dilution:**	1	**Dilution:**	1
Units:	ug/L	**Units:**	ug/L	**Units:**	ug/L

Analyte	Result	Result	Target	% Rec	QC Limits		Result	% Rec	RPD	QC Limits	
Perchlorate	ND	3.2	3	107	78.8	123.8	3.46	115	7.86	0.0	20.0

Comments

Field sample 2000952001 was analyzed and reported from a 1:1,000 dilution. The reporting limit has been adjusted accordingly.

QC Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

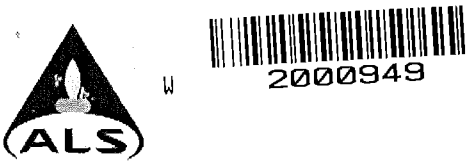
Analyst	Peer Review
/S/ Thomas Bosch	/S/ Stephen Brose
01/15/2020 13:39	01/15/2020 14:31

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 2000949



10450 Stancliff Rd, Ste 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

2000949

18698/#2

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID:** **13052**

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:
Email:

INVOICE INFORMATION:

Company: ALS Houston
Contact: Accounts Payable
Address: 10450 Stancliff Rd, Ste 210
Phone: +1 281 530 5656
Reference: HS20010261
TSR: Danielle Winnings

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS20010261-02**	**LH18/24-SP650_010720_BIX**	**Water**	**07 Jan 2020 14:00**
	SUB_Perch-6850			16 Jan 2020

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] Date/Time: 01/08/20 18:00
Received By: [signature] Date/Time: 1/9/20 09:28
Cooler ID(s): Temperature(s):

RIGHT SOLUTIONS | RIGHT PARTNER

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: 1/9/20 09:28

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		
	(Frozen)/Melted/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	Great	4 °C	4		°C	7		°C
2		°C	5		°C	8		°C
3		°C	6		°C	9		°C

Taken By: Jaylynn B. (Signature) Jaylynn Brittain (Printed Name) 1/9/20 (Date)

CLIENT-RELATED INFORMATION

☐ Missing Cooler	☐ Missing Samples/Bottles	☐ Incorrect Preservation	☐ Insufficient Sample Volume
☐ Cooler Conditions	☐ Broken/Leaking Samples	☐ pH Criteria Not Met	☐ Chain of Custody Problems
☐ Missing Paperwork	☐ Incorrect Bottle Type	☐ Residual Chlorine Present	☐ Other:
☐ Missing/Incorrect Bottle Labels	☐ Cooler Temperatures Out of Range	☐ 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: _____ (Printed Name) Returned to Sample Receipt by: _____ (Signature) Date: _____



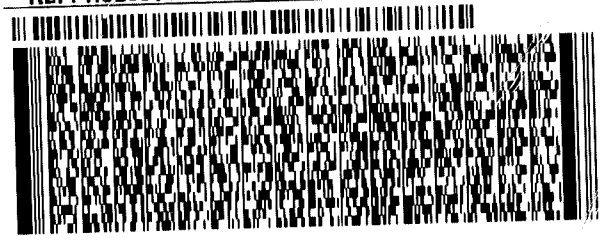
ORIGIN ID:SGRA (281) 530-5656
SHIPPING DEPT
ALS LABORATORY GROUP
10450 STANCLIFF RD
SUITE 210
HOUSTON, TX 77099
UNITED STATES US

SHIP DATE: 08JAN20
ACTWGT: 9.85 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) 266-7700
REF: HS20010258/259/261 RJ



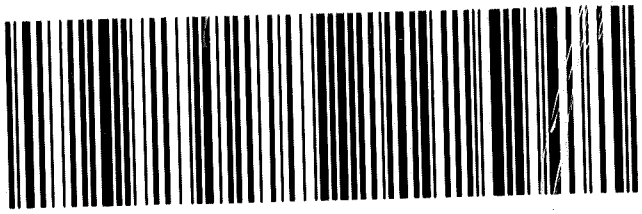
FedEx Express

THU - 09 JAN 3:00P
STANDARD OVERNIGHT

TRK# 0201 **1251 0293 5192**

AX BTFA

84123
UT-US **SLC**



00968800

ALS Environmental
CHAIN-OF-CUSTODY

Project / Job / Task: HS20010261-02	***Split:***	**Workorder ID: 2000949**	**Level:** ENV_LVL4
Client: ALS Environmental (Houston)		**Account:** 8101	**Type:** 125Poly
Comments:			**Preservatives** COOL

Requested Analysis

Item	Collect Date/Time	Sample ID	Lab ID	QC	Matrix	Containers ID(s)	Containers Count	EPA 6850, DoD QSM
1	01/07/2020 14:00	LH18/24-SP650_010720_BIX Water	2000949001		Water	A	1	A

70 of 138

ORIGINAL FIELD SAMPLE CHAIN-OF-CUSTODY

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location
VanTassell, Tami	01/09/2020 09:28	ALS Sample Receiving	Sample Login
Tami VanTassell	01-09-20 12:00	15B	Storage
R-33.1	01.13.20/08:35	T. Bosch	CL04 analysis

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

Batch Worklist

Batch: ELMS/ 2340
Rule: EPA 6850, DoD QSM Water

Created: 1/14/2020 15:38
Analyst: T. Bosch

Instrument: LCMS04
Status: WP

HBN: 255305

Workorder: 2000307 [ENV_LVL4]
Workorder: 2000949 [ENV_LVL4]
Workorder: 2000952 [ENV_LVL4]
Workorder: 2000953 [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	691928	CCV for HBN 255305 [ELMS/2340]				CCV	3		E685041C3Q	5311		1/16/2020	1/15/2020
2	691929	RLVS for HBN 255305 [ELMS/2340				RLVS	3		E685041C3Q	5311		1/16/2020	1/15/2020
3	692062	LCS for HBN 255305 [ELMS/2340]				LCS	3		E6850Q413Q	5311		1/16/2020	
4	691973	ICS for HBN 255305 [ELMS/2340]				ICS	3		E6850..D3Q	5311		1/16/2020	1/15/2020
5	691930	LMB for HBN 255305 [ELMS/2340]				LMB	3		E6850Q413Q	5311		1/16/2020	1/15/2020
6	2000307001	LH18/24-SP650_1230.19_BIX				SAMPLE	3	2000307001-A	E6850Q41.3	5480	1/27/2020	1/16/2020	1/15/2020
7	691932	LH18/24-SP650...(2000307001MS)				MS	3		E6850Q413Q	5311		1/16/2020	1/15/2020
8	691933	LH18/24-SP65...(2000307001MSD)				MSD	3		E6850Q413Q	5311		1/16/2020	1/15/2020
9	2000949001	LH18/24-SP650_010720_BIX Water				SAMPLE	3	2000949001-A	E6850Q41.3	5480	2/4/2020	1/22/2020	1/15/2020
10	2000952001	LH18/24-SP140_010720				SAMPLE	3	2000952001-A	E6850Q41.3	5480	2/4/2020	1/23/2020	1/15/2020
11	2000953001	LH18/24-SP650_010720_BIX Water				SAMPLE	3	2000953001-A	E6850Q41.3	5480	2/4/2020	1/22/2020	1/15/2020
12	691934	CCV for HBN 255305 [ELMS/2340]				CCV	3		E685041C3Q	5311		1/16/2020	1/15/2020

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Analytical Documentation

Analyst Write-up

ALS Work Order #'s & Sample #( )'s: 2000307 (001); 2000949 (001); 2000952 (001); 2000953 (001)
ELMS Batch/HBN ID: 2336 (254688)
Prep Date: 01/13/2020 Analysis Date: 01/15/2020 Analyst: Tom Bosch
Analyte: **Perchlorate** Matrix: **Water** Method: **6850**
Sequence: \\HPCHEM\1\SEQUENCE\CLO4\2020\JAN\15JAN20D.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 692092; Target = 3.0µg/L. ASTM type II water was used for LMB 691930.

MS/MSD: The Matrix Spike and duplicate (MS/MSD) was performed on sample 2000307001 (Client ID: LH24-SP650_1230.19_BIX). 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 2000952001 was analyzed and reported from a 1:1,000 dilution. The reporting limit has 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\2020\JAN\HBN# or through NuGenesis\Tree\PrintData\LCMS\DefaultView.
4) Notebook: \\alsltws013\ORGANIC\BOSCH\LCMS\Perchlorates\Waters\2020\DOD\255305-DoD-ALS-Hstn LCMS4 or through \\ALSLTWS013\DATAREVIEW\HBN#
5) The Reporting Limit Verification Standard (RLVS – 691929) is reported from the analysis of the Laboratory Control Sample (LCS – 692062) 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 **Batch(es)/SDG:** ELMS: 2340 HBN: 255305 **Sample Set IDs if Applicable:** 2000307/2000949/2000952/2000953	**Analyst Initials**	**Reviewer Initials**
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
MFG: ALS/SLC
MFG Lot: TNB: 09/20/2019
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 09/23/2019 03:09PM

Amount: 10 mL
Expires: 07/25/2020
Usable: Yes
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

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New Haven, CT 06513
USA

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CERTIFICATE OF ANALYSIS

S 43659

AccuTrace™ Reference Standard

Catalog No: IC-PER-10X-1
Description: Perchlorate Standard
Element: Perchlorate (ClO_4)
SRM: Ind. Std.
Lot: 218065075
Matrix: Water
Hazards: *Refer to SDS for complete safety information*

Signal Word: None

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

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

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

ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

TRIPLE ISO CERTIFICATION ISO 9001 ISO GUIDE 34 ISO 17025 ULTRA

ISO Guide 34 Reference Material

Product Number: ICC-013
Lot Number: CP-0860

S 36748

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.

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

ANAB ACCREDITED ISO/IEC 17025 TESTING LABORATORY

ISO 9001 Registered Quality System – TUV USA

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ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

TRIPLE ISO CERTIFICATION ULTRA ISO 9001:2008 ISO GUIDE 34 ISO 17025

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

ANAB ACCREDITED ISO GUIDE 34 REFERENCE MATERIAL PRODUCER

ANAB ACCREDITED ISO 17025 TESTING LABORATORY

ISO 9001 Registered Quality System – TUV USA

Cambridge Isotope Laboratories, Inc.

Certificate of Analysis

S 47863

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:	≥ 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.

$NaCl^{18}O_4$

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 ± 1.0 µg/mL (k=2)
Chemical Purity of Neat Material(s)	98%
LC/MS for Concentration	105.4 ± 1.1 µg/mL (k=2)

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

00968820

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
	*	691928 CCV@25	Vial 71	1	Control	1	1.72889e6	7.434	23.42373
	*	691929 RLVS@3.	Vial 72	1	Control	2	2.18673e5	7.137	3.28544
	*	691973 ICS@3.0	Vial 73	1	Control	3	1.35107e5	7.223	2.74699
	*	691930 LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
	*	2000307001	Vial 75	1	Sample	5	0.00000	0.000	0.00000
	*	691932 03071MS	Vial 76	1	Sample	6	2.05477e5	7.225	3.19824
	*	691933 03071SD	Vial 77	1	Sample	7	2.03421e5	7.166	3.45981
	*	2000949001	Vial 78	1	Sample	8	1.28802e5	7.167	1.95055
	*	2000952001 1K	Vial 79	1	Sample	9	9.69192e5	7.467	1.33675e4
	*	2000953001	Vial 80	1	Sample	10	1.27924e5	7.209	1.98446
	*	691934 CCV@25	Vial 71	1	Control	11	1.75169e6	7.513	23.40547

#	*	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
	*	691928 CCV@25	Vial 71	1	Control	1	2.53846e5	7.458	5.00000
	*	691929 RLVS@3.	Vial 72	1	Control	2	2.45151e5	7.155	5.00000
	*	691973 ICS@3.0	Vial 73	1	Control	3	1.80729e5	7.237	5.00000
	*	691930 LMB	Vial 74	1	Control	4	2.29509e5	7.359	5.00000
	*	2000307001	Vial 75	1	Sample	5	2.52311e5	7.208	5.00000
	*	691932 03071MS	Vial 76	1	Sample	6	2.36573e5	7.234	5.00000
	*	691933 03071SD	Vial 77	1	Sample	7	2.16655e5	7.188	5.00000
	*	2000949001	Vial 78	1	Sample	8	2.40635e5	7.188	5.00000
	*	2000952001 1K	Vial 79	1	Sample	9	2.59889e5	7.488	5000.00000
	*	2000953001	Vial 80	1	Sample	10	2.35040e5	7.233	5.00000
	*	691934 CCV@25	Vial 71	1	Control	11	2.57415e5	7.543	5.00000

#	*	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
	*	691928 CCV@25	Vial 71	1	Control	1	5.16114e5	7.454	22.95643
	*	691929 RLVS@3.	Vial 72	1	Control	2	7.08840e4	7.153	3.40228
	*	691973 ICS@3.0	Vial 73	1	Control	3	4.90107e4	7.237	3.18375
	*	691930 LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
	*	2000307001	Vial 75	1	Sample	5	0.00000	0.000	0.00000
	*	691932 03071MS	Vial 76	1	Sample	6	7.10460e4	7.230	3.53797
	*	691933 03071SD	Vial 77	1	Sample	7	7.17154e4	7.182	3.91012
	*	2000949001	Vial 78	1	Sample	8	4.39331e4	7.199	2.09952
	*	2000952001 1K	Vial 79	1	Sample	9	2.85347e5	7.486	1.28498e4
	*	2000953001	Vial 80	1	Sample	10	4.63748e4	7.229	2.28052
	*	691934 CCV@25	Vial 71	1	Control	11	5.25077e5	7.533	23.02547

*** End of Report ***

Sequence Table:

Method and Injection Info Part:

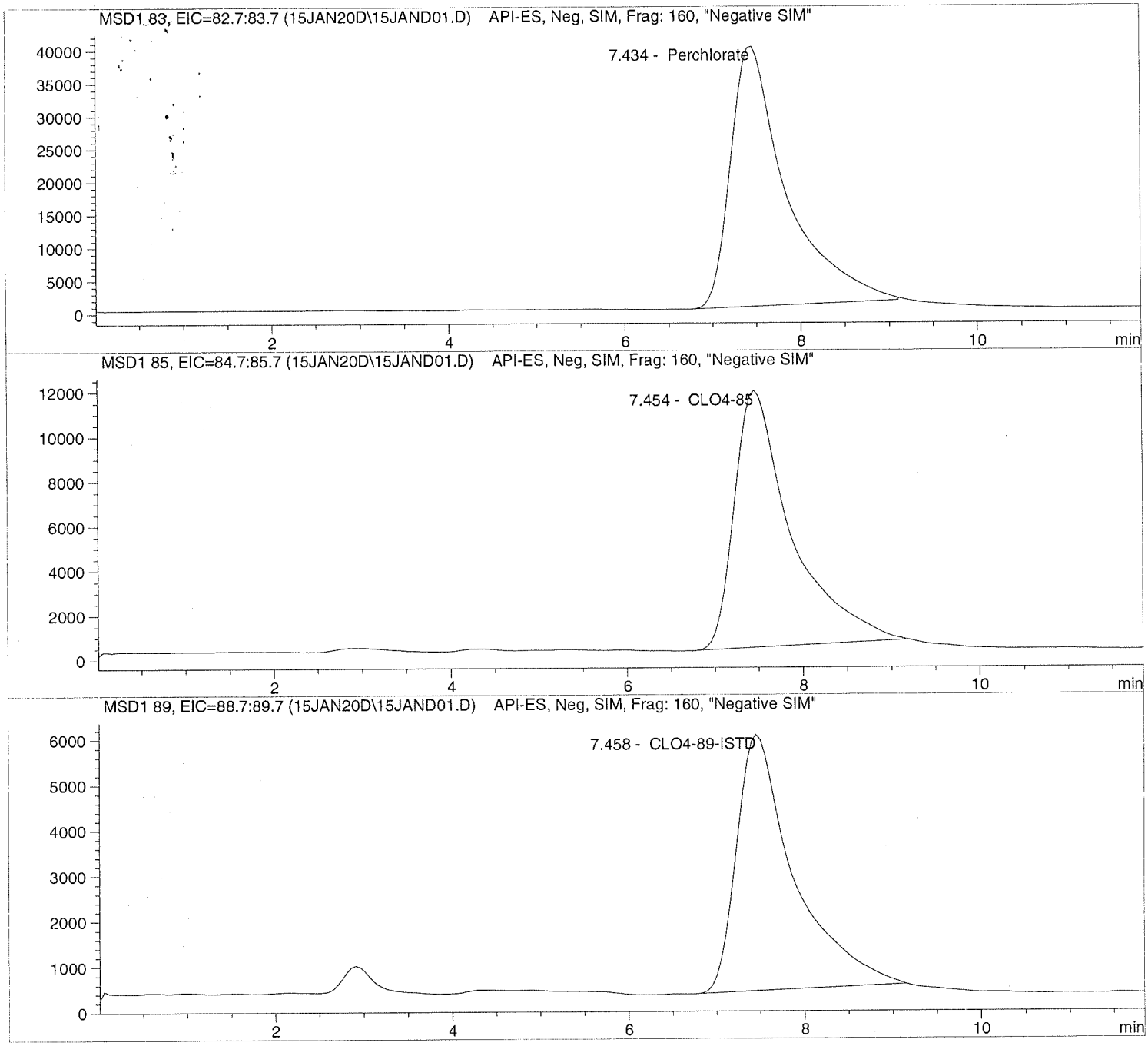
Line	Location	SampleName		Method	Inj	SampleType	InjVolume	DataFile
1	Vial 71	691928	CCV@25	CLO4-AQN	1	Ctrl Samp		
2	Vial 72	691929	RLVS@3.	CLO4-AQN	1	Ctrl Samp		
3	Vial 73	691973	ICS@3.0	CLO4-AQN	1	Ctrl Samp		
4	Vial 74	691930	LMB	CLO4-AQN	1	Ctrl Samp		
5	Vial 75	2000307001		CLO4-AQN	1	Sample		
6	Vial 76	691932	03071MS	CLO4-AQN	1	Sample		
7	Vial 77	691933	03071SD	CLO4-AQN	1	Sample		
8	Vial 78	2000949001		CLO4-AQN	1	Sample		
9	Vial 79	2000952001	1K	CLO4-AQN	1	Sample		
10	Vial 80	2000953001		CLO4-AQN	1	Sample		
11	Vial 71	691934	CCV@25	CLO4-AQN	1	Ctrl Samp		

Data file: C:\HPCHEM\1\DATA\15JAN20D\15JAND01.D Sample Name: 691928 CCV@25

Injection Date:	1/15/2020 09:13:04	Seq Line:	1
Sample Name:	691928 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\15JAN20D\15JAND01.D Sample Name: 691928 CCV@25

Injection Date:	1/15/2020 09:13:04	Seq Line:	1
Sample Name:	691928 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
7.434	PBA	1728889.5	23.4237	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.454	PBA	516113.6	22.9564	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.458	PBA	253846.5	5.0000	CLO4-89-ISTD

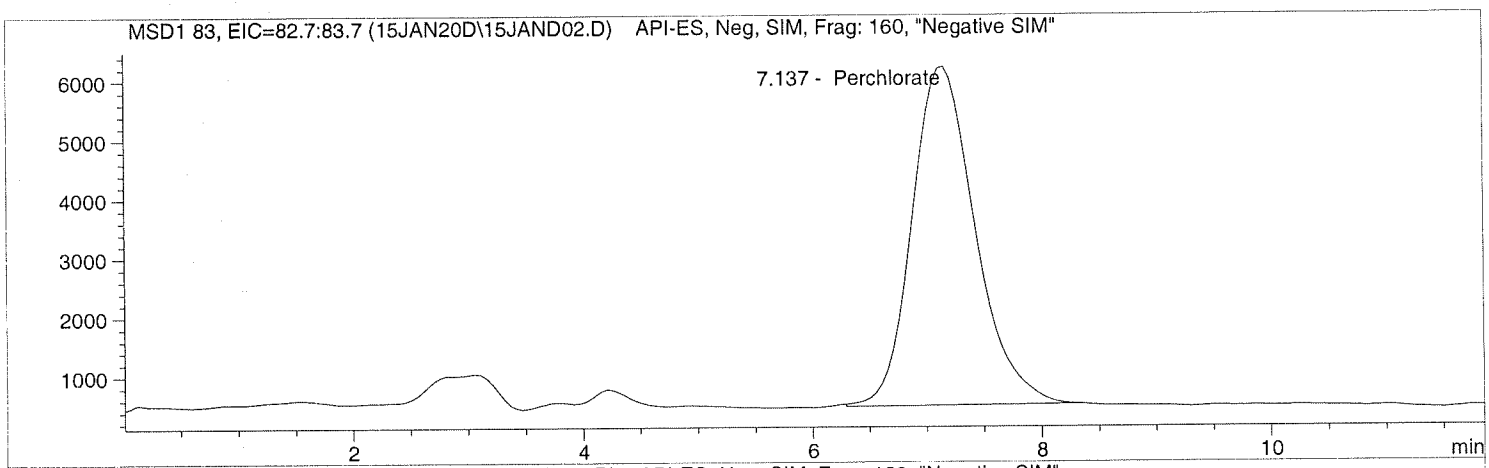
*** End of Report ***

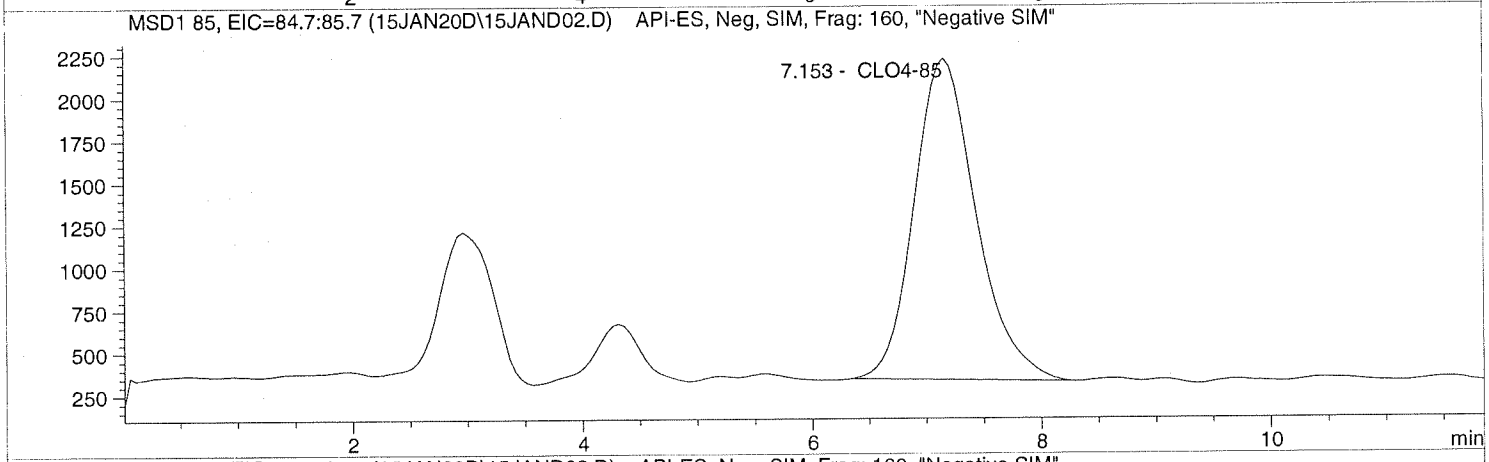
Data file: C:\HPCHEM\1\DATA\15JAN20D\15JAND02.D Sample Name: 691929 RLVS@3.

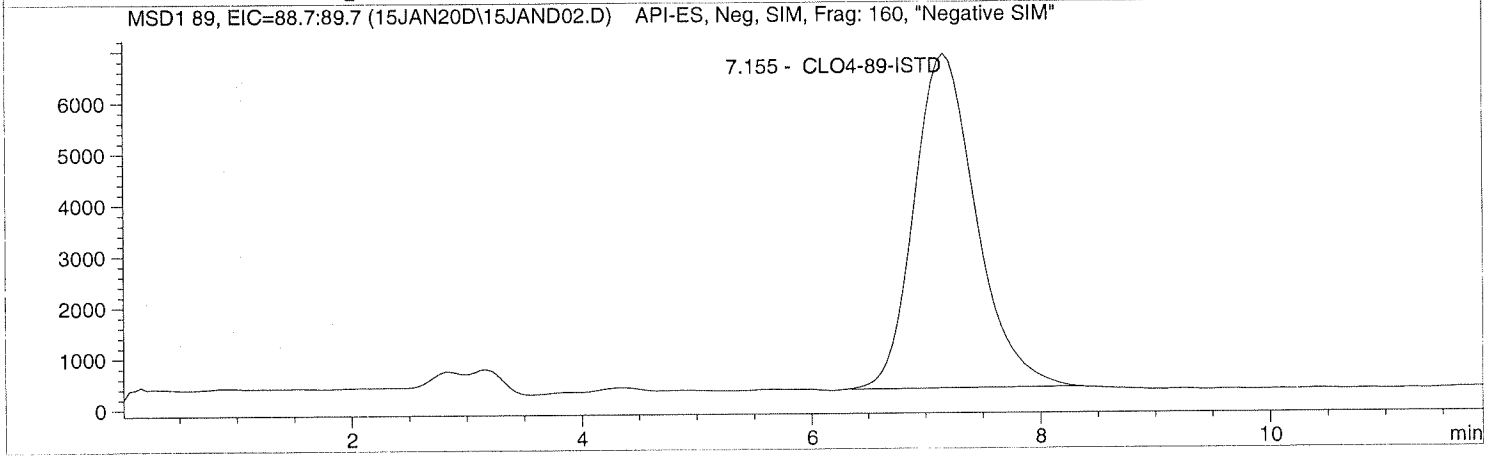
Injection Date:	1/15/2020 09:26:54	Seq Line:	2
Sample Name:	691929 RLVS@3.	Location:	Vial 72
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

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\15JAN20D\15JAND02.D Sample Name: 691929 RLVS@3.

Injection Date:	1/15/2020 09:26:54	Seq Line:	2
Sample Name:	691929 RLVS@3.	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
7.137	BBA	218673.2	3.2854	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.153	BBA	70884.0	3.4023	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.155	PBA	245151.2	5.0000	CLO4-89-ISTD

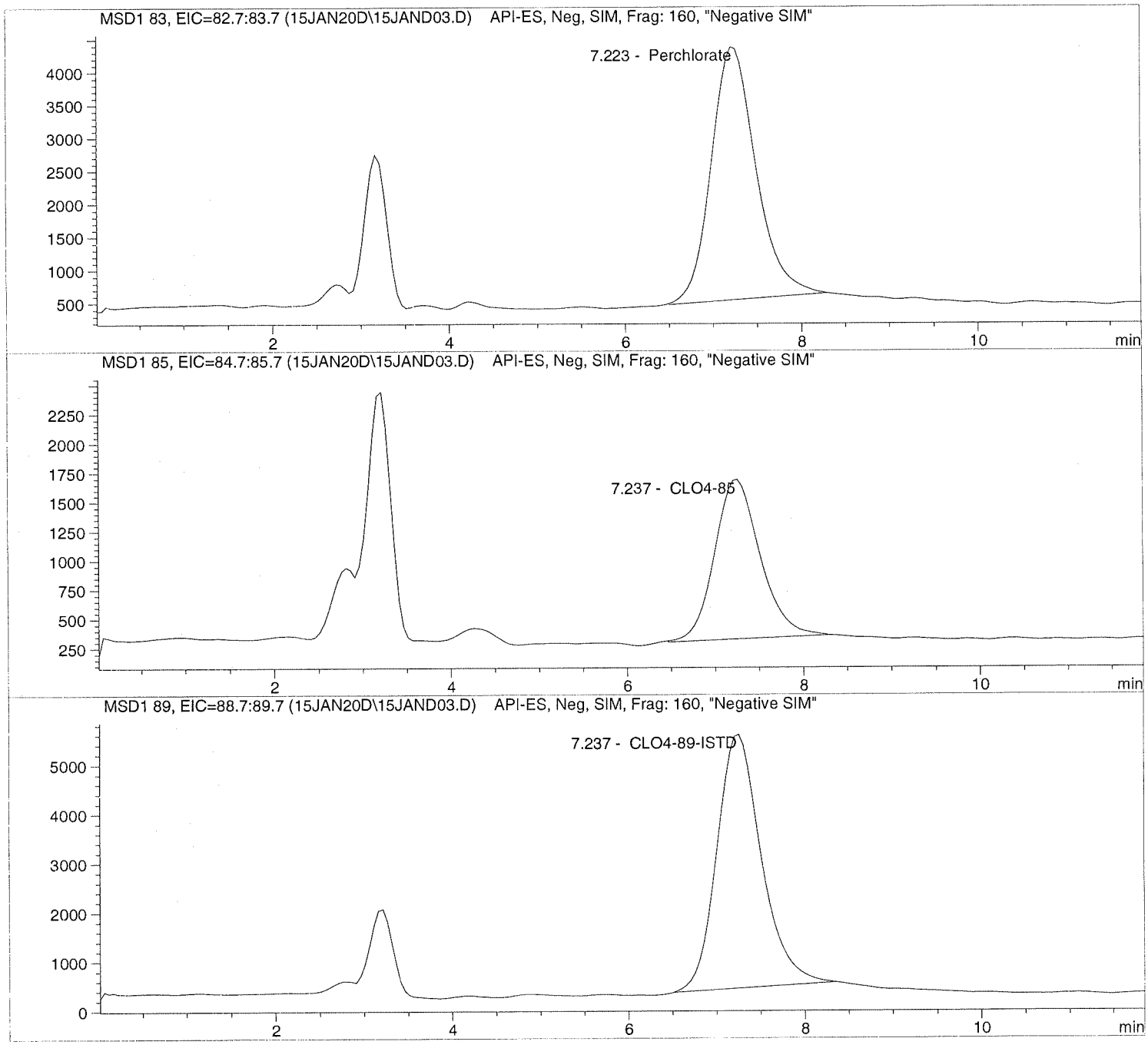
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\15JAN20D\15JAND03.D Sample Name: 691973 ICS@3.0

Injection Date:	1/15/2020 09:40:49	Seq Line:	3
Sample Name:	691973 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\15JAN20D\15JAND03.D Sample Name: 691973 ICS@3.0

Injection Date:	1/15/2020 09:40:49	Seq Line:	3
Sample Name:	691973 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
7.223	PBA	135106.7	2.7470	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.237	BBA	49010.7	3.1837	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.237	PBA	180729.3	5.0000	CLO4-89-ISTD

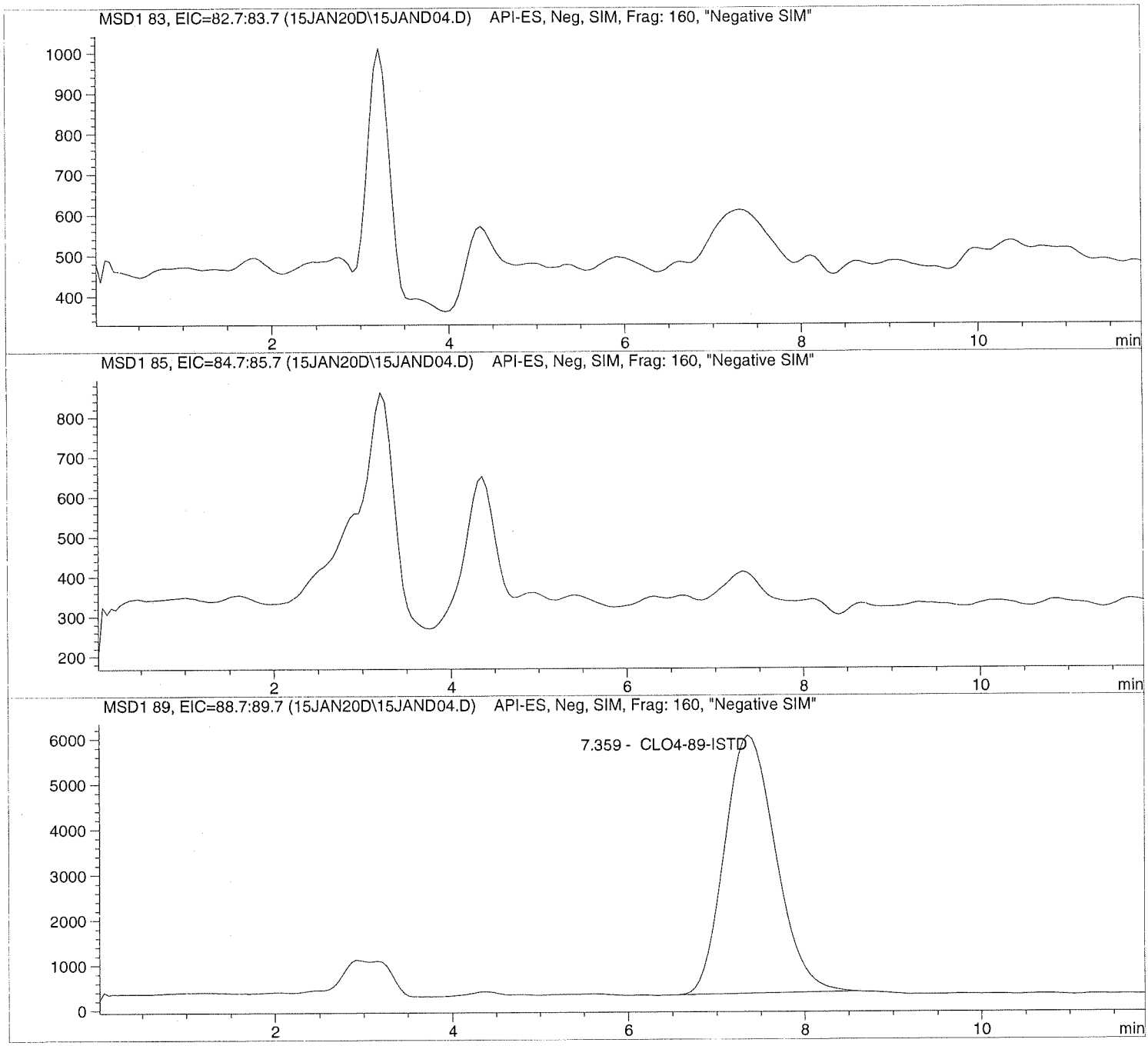
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\15JAN20D\15JAND04.D Sample Name: 691930 LMB

Injection Date:	1/15/2020 09:54:46	Seq Line:	4
Sample Name:	691930 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\15JAN20D\15JAND04.D Sample Name: 691930 LMB

Injection Date:	1/15/2020 09:54:46	Seq Line:	4
Sample Name:	691930 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
7.359	PBA	229508.7	5.0000	CLO4-89-ISTD

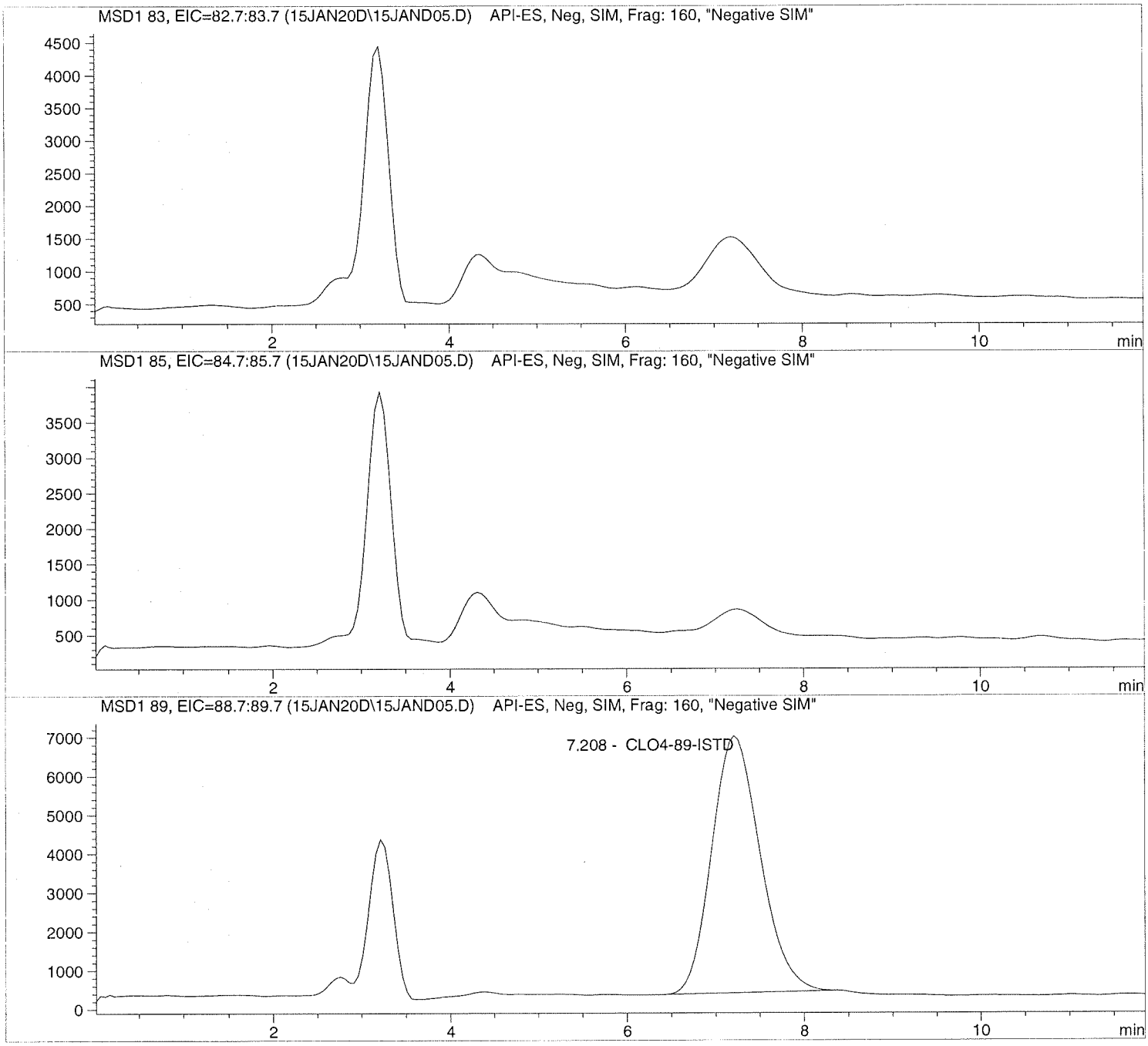
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\15JAN20D\15JAND05.D Sample Name: 2000307001

Injection Date:	1/15/2020 10:08:38	Seq Line:	5
Sample Name:	2000307001	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\15JAN20D\15JAND05.D Sample Name: 2000307001

Injection Date:	1/15/2020 10:08:38	Seq Line:	5
Sample Name:	2000307001	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
7.208	PBA	252311.3	5.0000	CLO4-89-ISTD

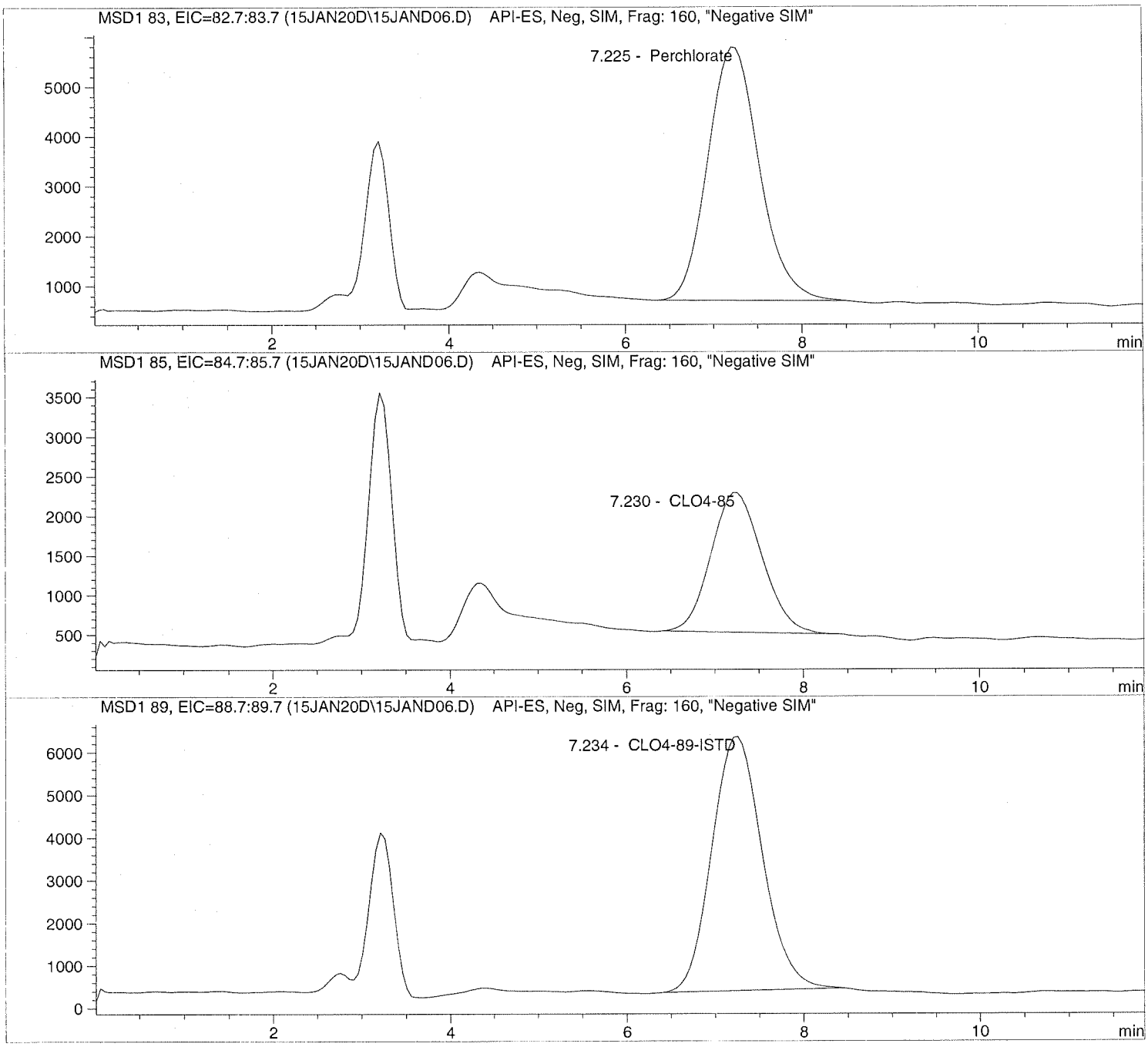
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\15JAN20D\15JAND06.D Sample Name: 691932 03071MS

Injection Date:	1/15/2020 10:22:29	Seq Line:	6
Sample Name:	691932 03071MS	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\15JAN20D\15JAND06.D Sample Name: 691932 03071MS

Injection Date:	1/15/2020 10:22:29	Seq Line:	6
Sample Name:	691932 03071MS	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
7.225	PBA	205477.1	3.1982	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.230	PBA	71046.0	3.5380	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.234	PBA	236573.4	5.0000	CLO4-89-ISTD

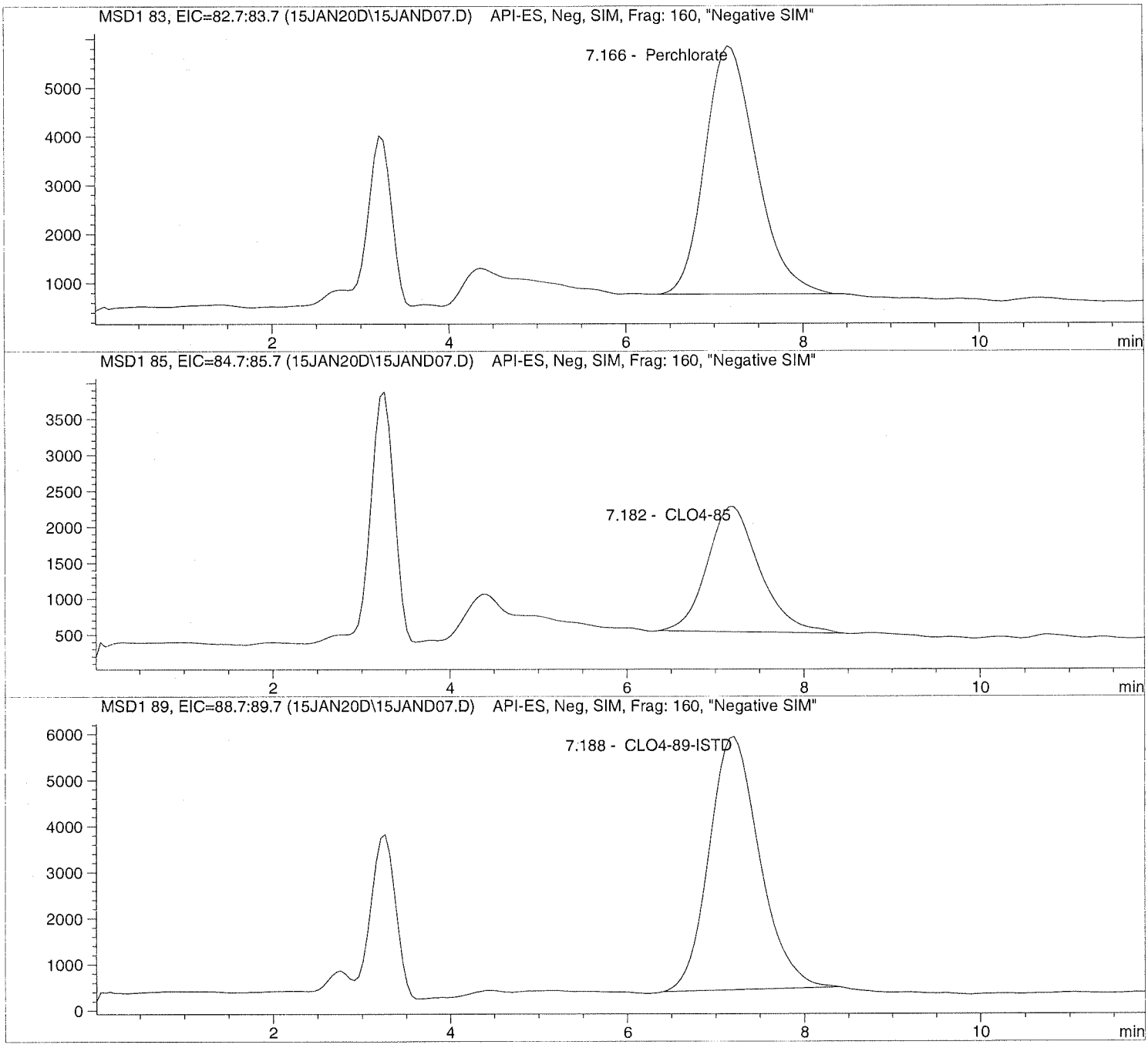
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\15JAN20D\15JAND07.D Sample Name: 691933 03071SD

Injection Date:	1/15/2020 10:36:32	Seq Line:	7
Sample Name:	691933 03071SD	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\15JAN20D\15JAND07.D Sample Name: 691933 03071SD

Injection Date:	1/15/2020 10:36:32	Seq Line:	7
Sample Name:	691933 03071SD	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
7.166	PBA	203421.1	3.4598	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.182	PBA	71715.4	3.9101	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.188	PBA	216654.6	5.0000	CLO4-89-ISTD

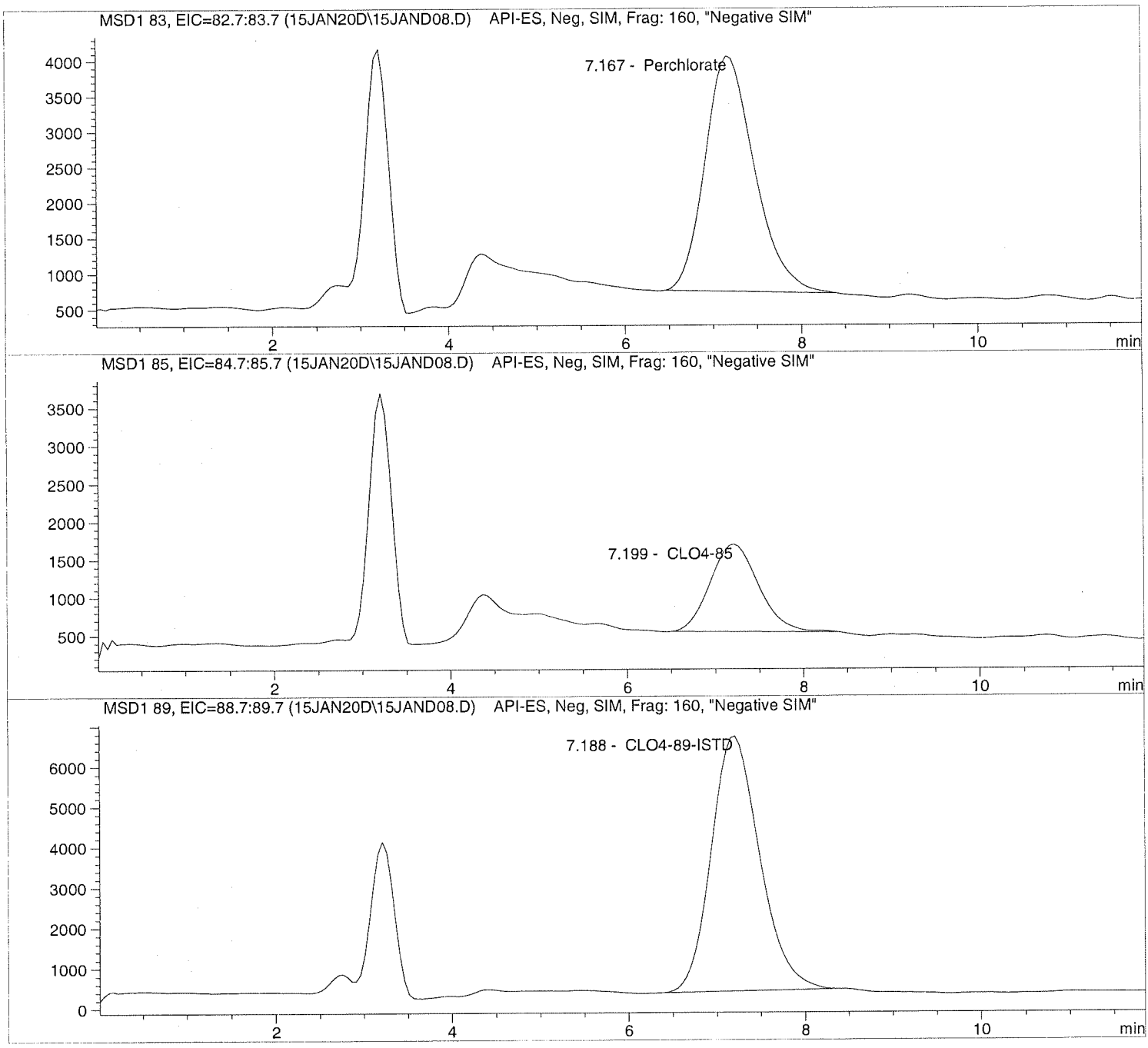
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\15JAN20D\15JAND08.D Sample Name: 2000949001

Injection Date:	1/15/2020 10:50:37	Seq Line:	8
Sample Name:	2000949001	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



Data file: C:\HPCHEM\1\DATA\15JAN20D\15JAND08.D Sample Name: 2000949001

Injection Date:	1/15/2020 10:50:37	Seq Line:	8
Sample Name:	2000949001	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
7.167	PBA	128801.7	1.9506	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.199	PBA	43933.1	2.0995	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.188	PBA	240635.1	5.0000	CLO4-89-ISTD

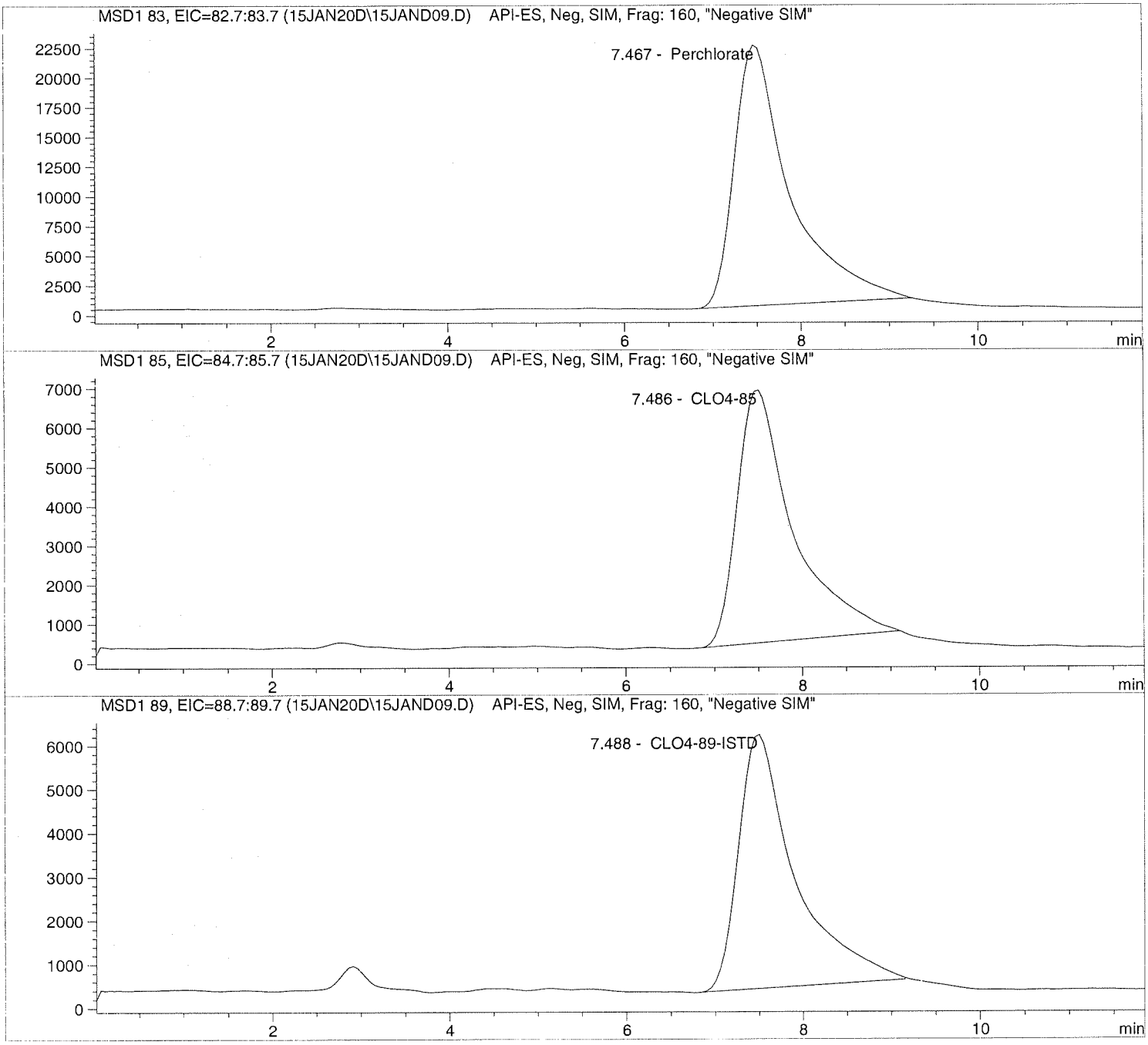
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\15JAN20D\15JAND09.D Sample Name: 2000952001 1K

Injection Date:	1/15/2020 11:04:28	Seq Line:	9
Sample Name:	2000952001 1K	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\15JAN20D\15JAND09.D Sample Name: 2000952001 1K

Injection Date:	1/15/2020 11:04:28	Seq Line:	9
Sample Name:	2000952001 1K	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:	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
7.467	PBA	969191.8	13367.4646	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.486	PBA	285347.1	12849.8345	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.488	PBA	259888.6	5000.0000	CLO4-89-ISTD

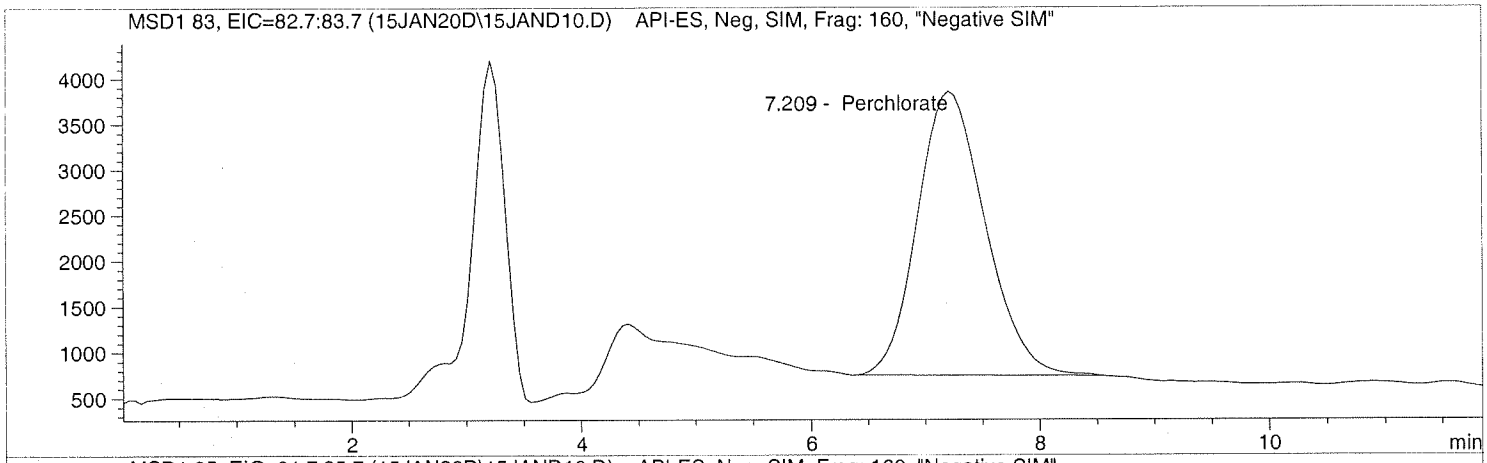
*** End of Report ***

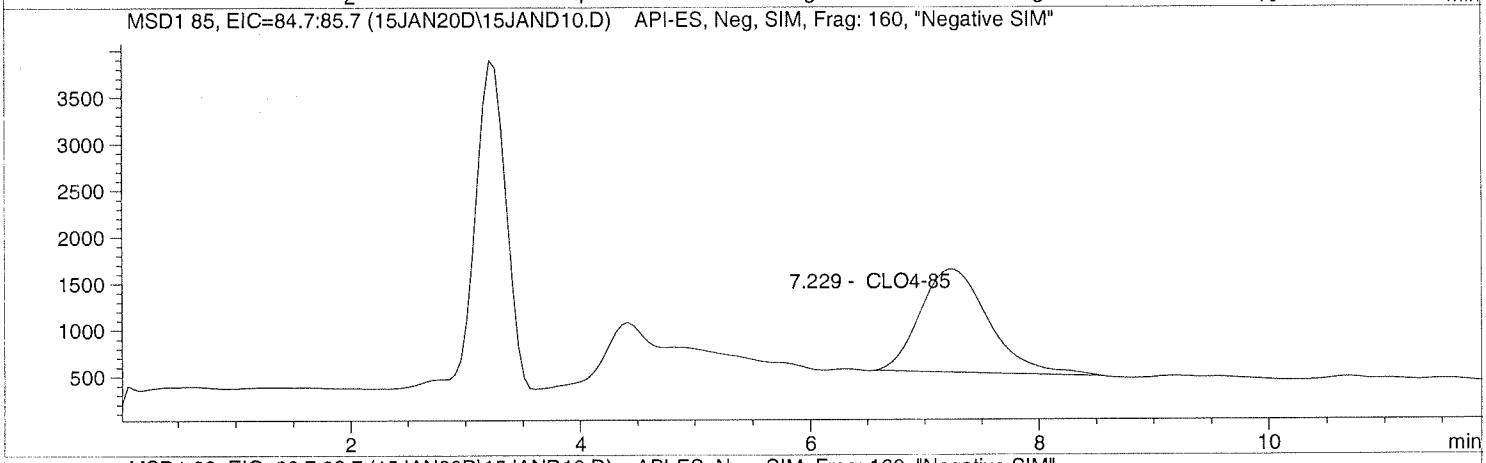
Data file: C:\HPCHEM\1\DATA\15JAN20D\15JAND10.D Sample Name: 2000953001

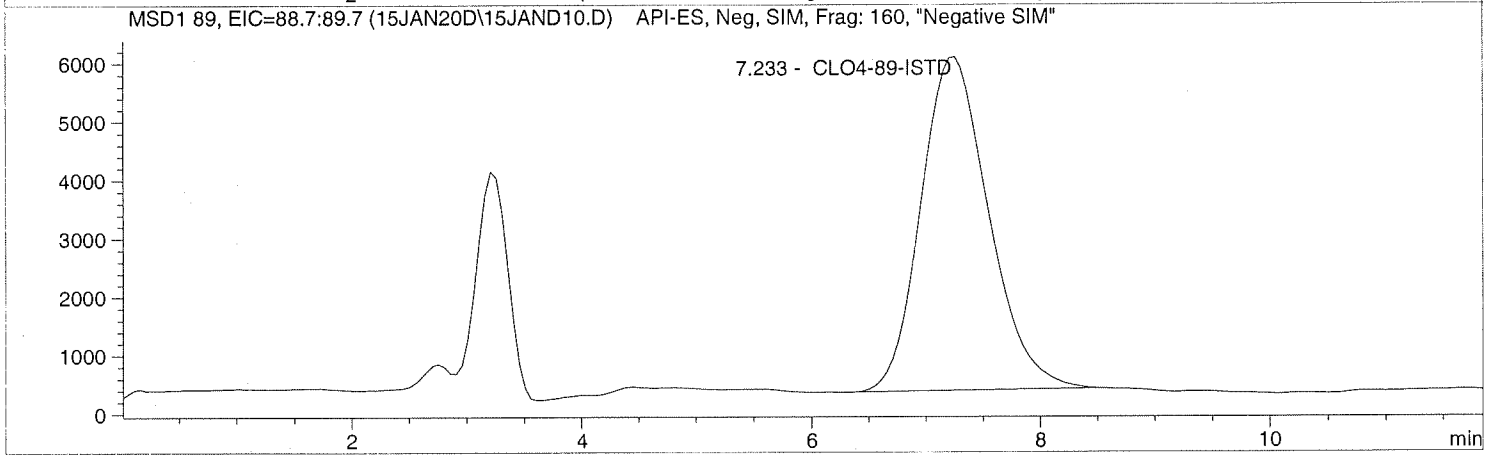
Injection Date:	1/15/2020 11:18:21	Seq Line:	10
Sample Name:	2000953001	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

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\15JAN20D\15JAND10.D Sample Name: 2000953001

Injection Date:	1/15/2020 11:18:21	Seq Line:	10
Sample Name:	2000953001	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
7.209	PBA	127923.8	1.9845	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.229	PBA	46374.8	2.2805	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.233	PBA	235039.6	5.0000	CLO4-89-ISTD

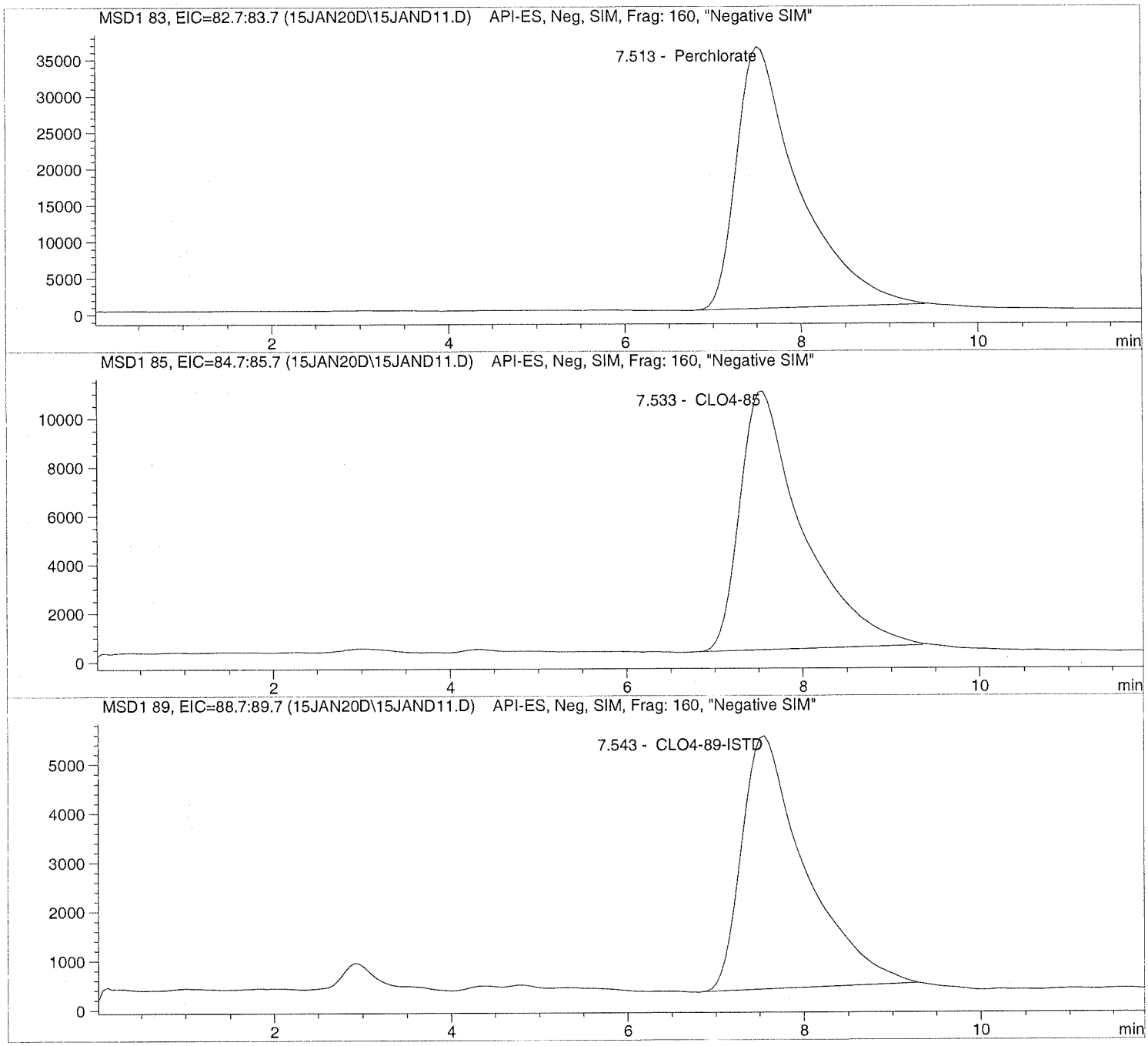
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\15JAN20D\15JAND11.D Sample Name: 691934 CCV@25

Injection Date:	1/15/2020 11:33:15	Seq Line:	11
Sample Name:	691934 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\15JAN20D\15JAND11.D Sample Name: 691934 CCV@25

Injection Date:	1/15/2020 11:33:15	Seq Line:	11
Sample Name:	691934 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
7.513	PBA	1751693.0	23.4055	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.533	PBA	525076.8	23.0255	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.543	PBA	257414.7	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]	Sig	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]	Sig	Lvl	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

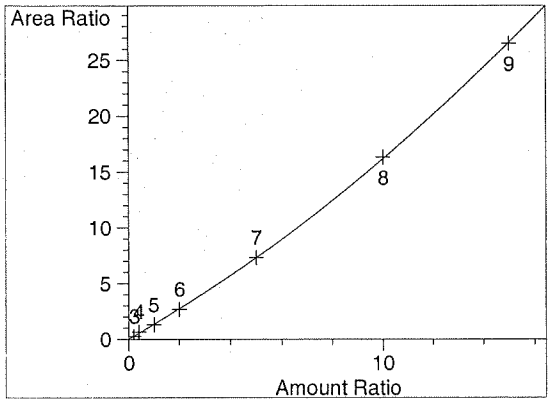
Compound: CLO4-89-ISTD
- Time Window : From 3.581 min To 11.896 min
- Curve Type : Linear
- Origin : Included
- Calibration Level Weights:/
  - Level 3 : 1
  - Level 4 : 1
  - Level 5 : 1
  - Level 6 : 1
  - Level 7 : 1
  - Level 8 : 1
  - Level 9 : 1

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

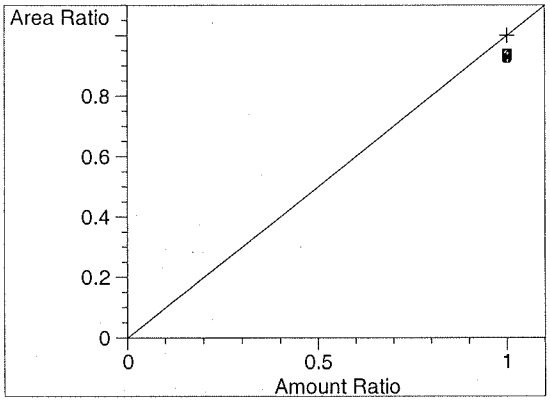
Peak Sum Table

No Entries in table

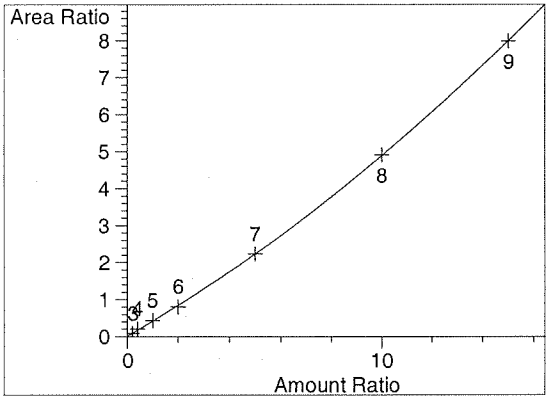
Calibration Curves



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:

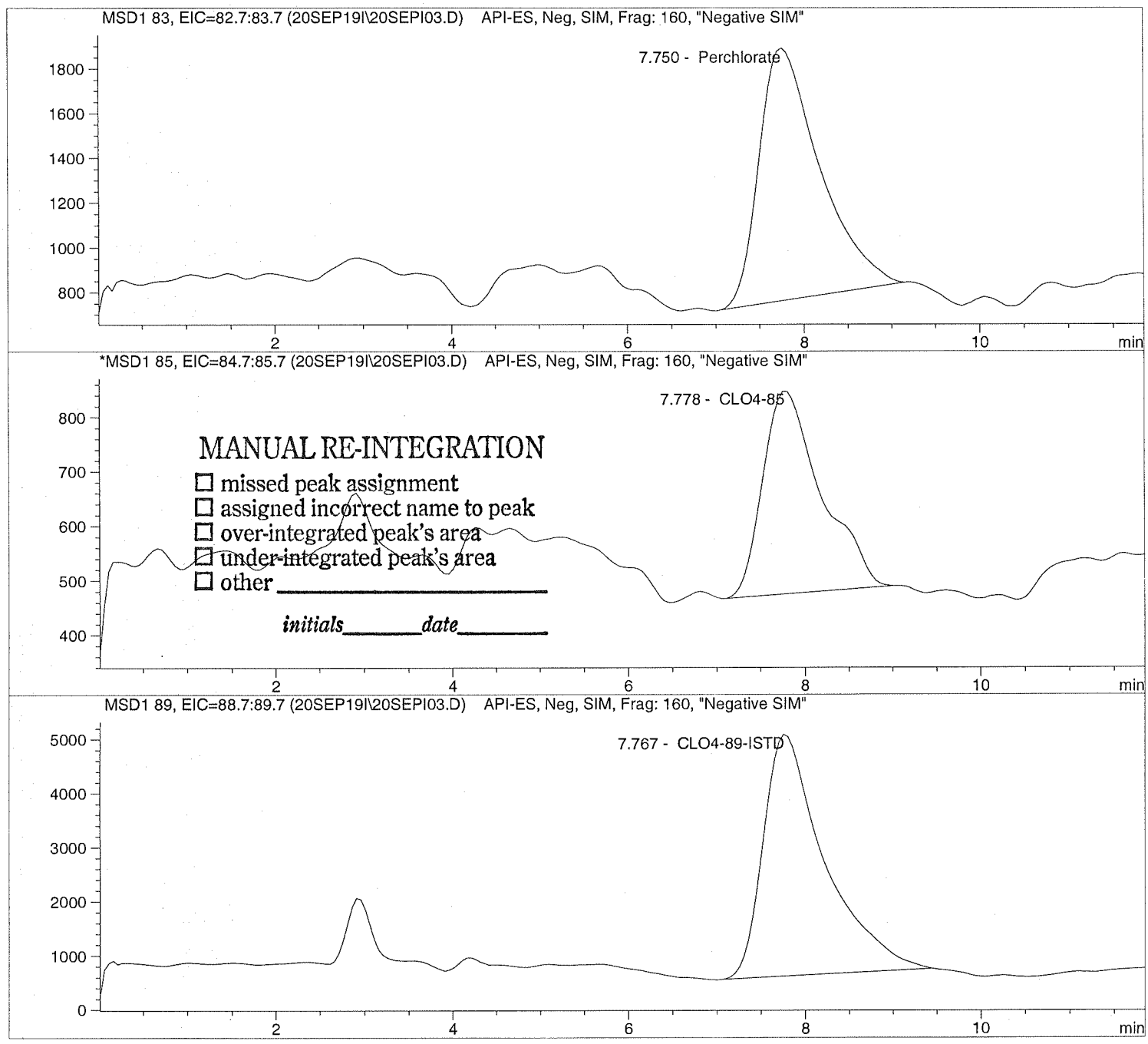
Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
1	Vial 71	CLO4@ 0.2ug/L	CLO4-AQN	1	Ctrl Samp		
2	Vial 72	CLO4@ 0.5ug/L	CLO4-AQN	1	Ctrl Samp		
3	Vial 73	CLO4@ 1.0ug/L	CLO4-AQN	1	Ctrl Samp		
4	Vial 74	CLO4@ 2.0ug/L	CLO4-AQN	1	Ctrl Samp		
5	Vial 75	CLO4@ 5.0ug/L	CLO4-AQN	1	Ctrl Samp		
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

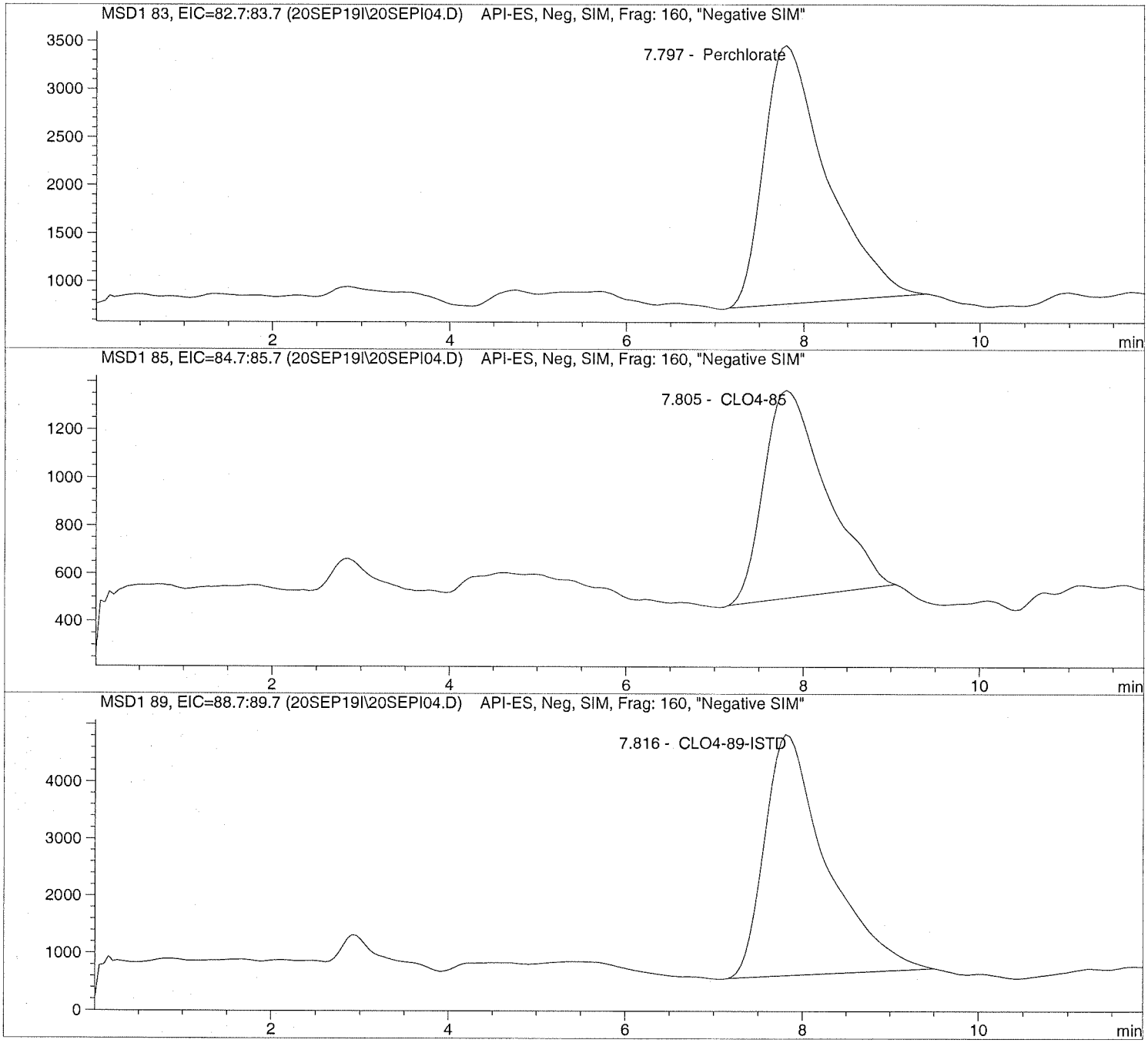
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI04.D Sample Name: CLO4@ 2.0ug/L

Injection Date:	9/20/2019 09:37:58	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

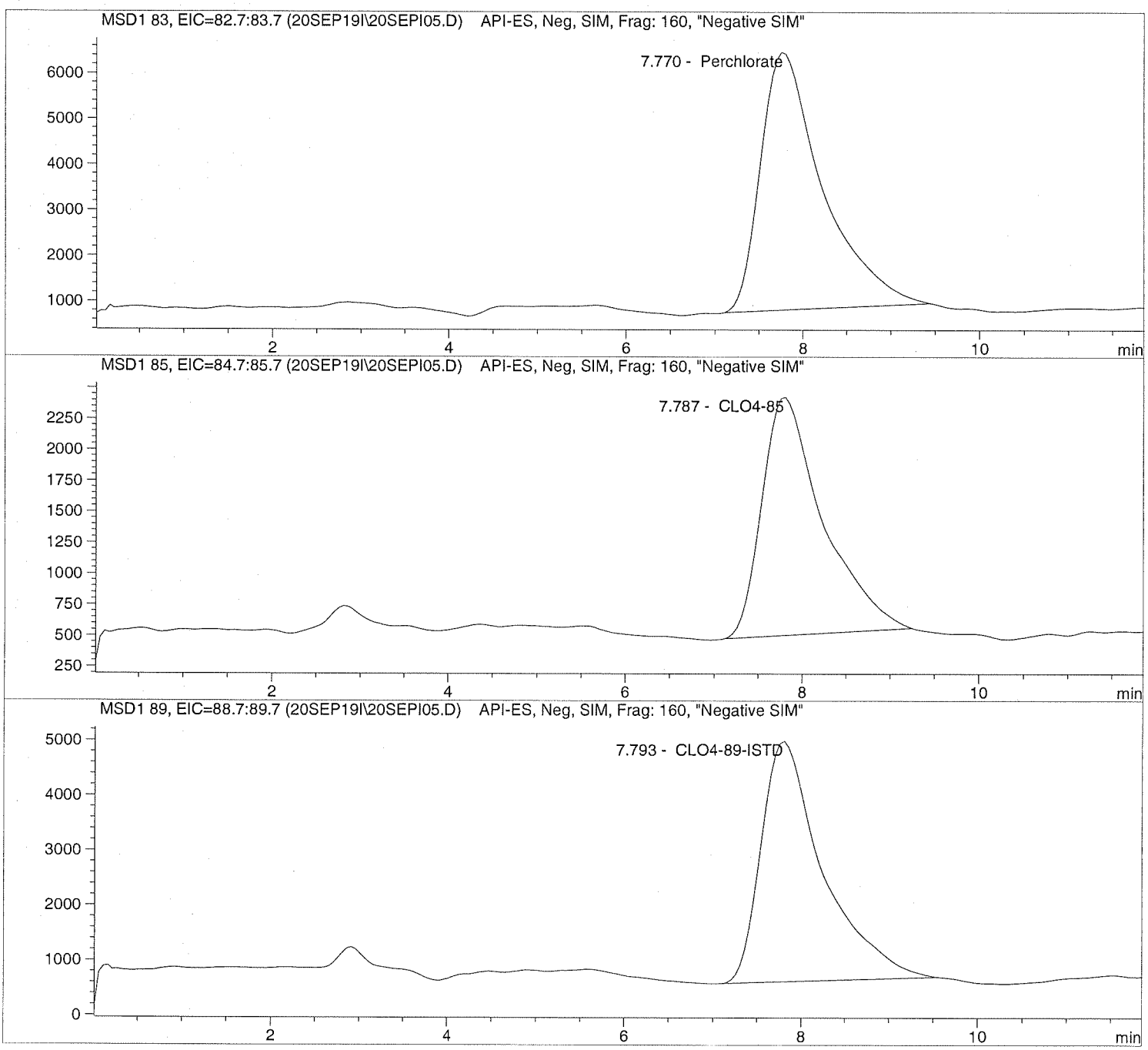
*** End of Report ***

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

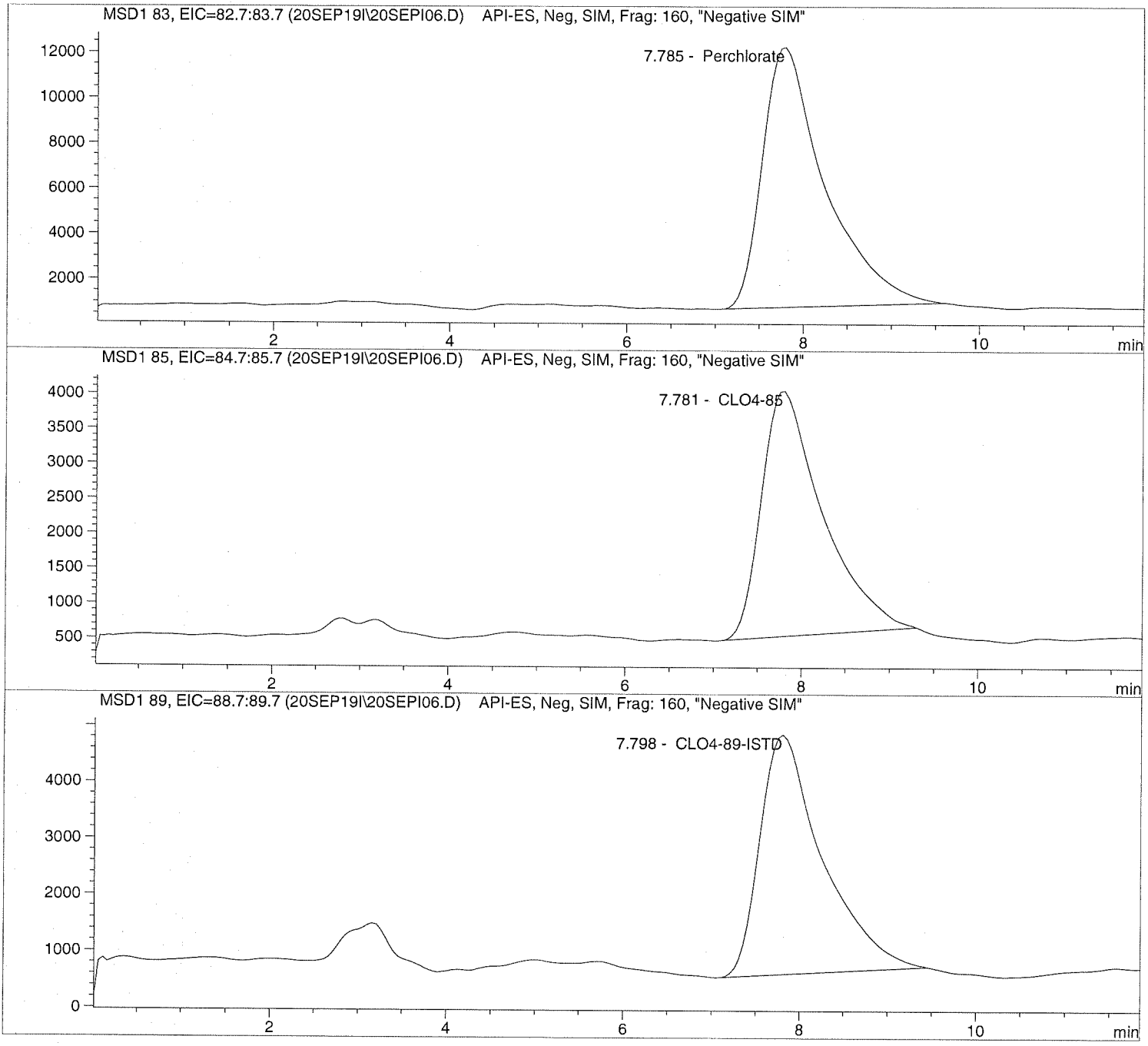
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI06.D Sample Name: CLO4@ 10.ug/L

Injection Date:	9/20/2019 10:05:36	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

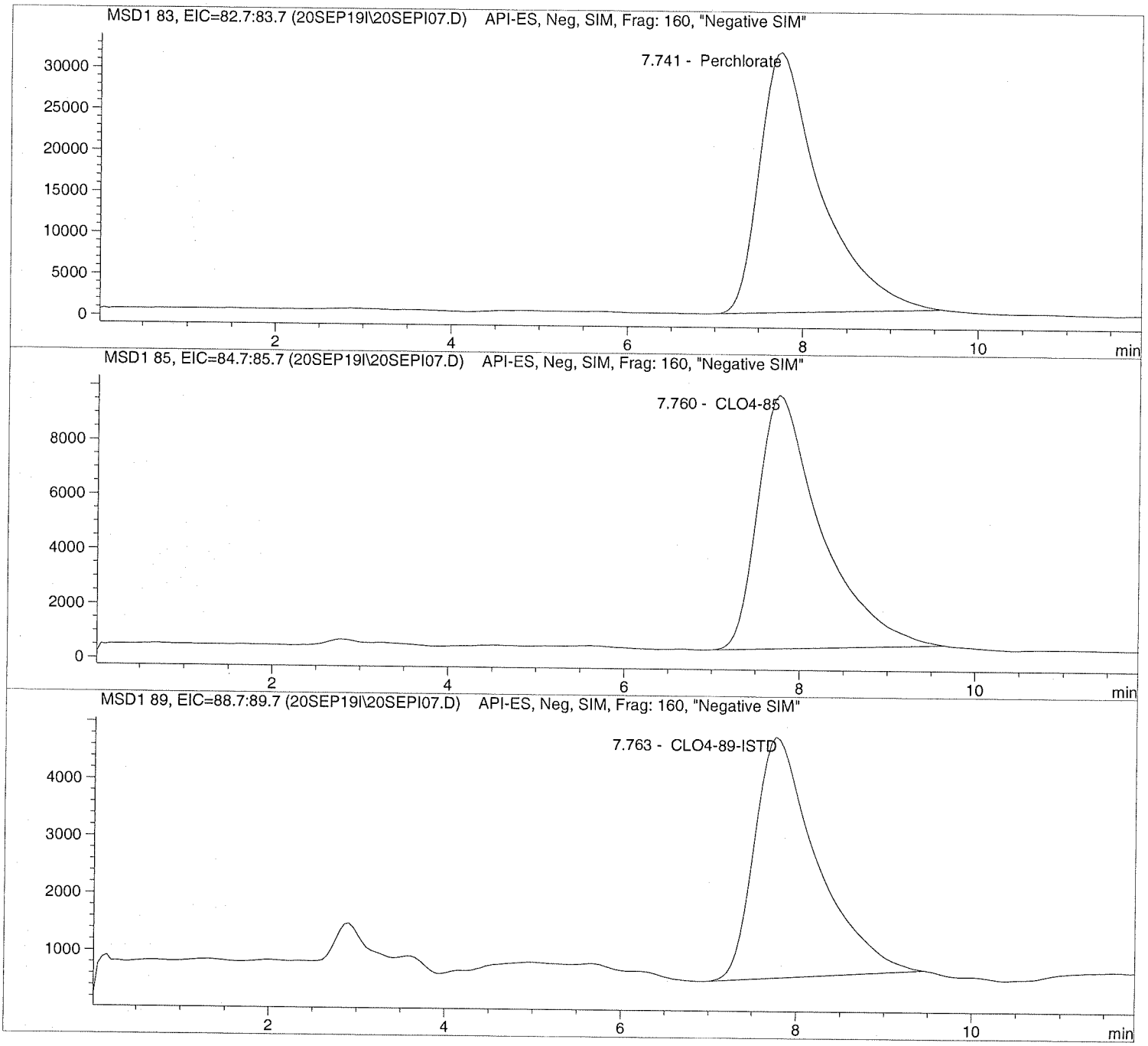
*** End of Report ***

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

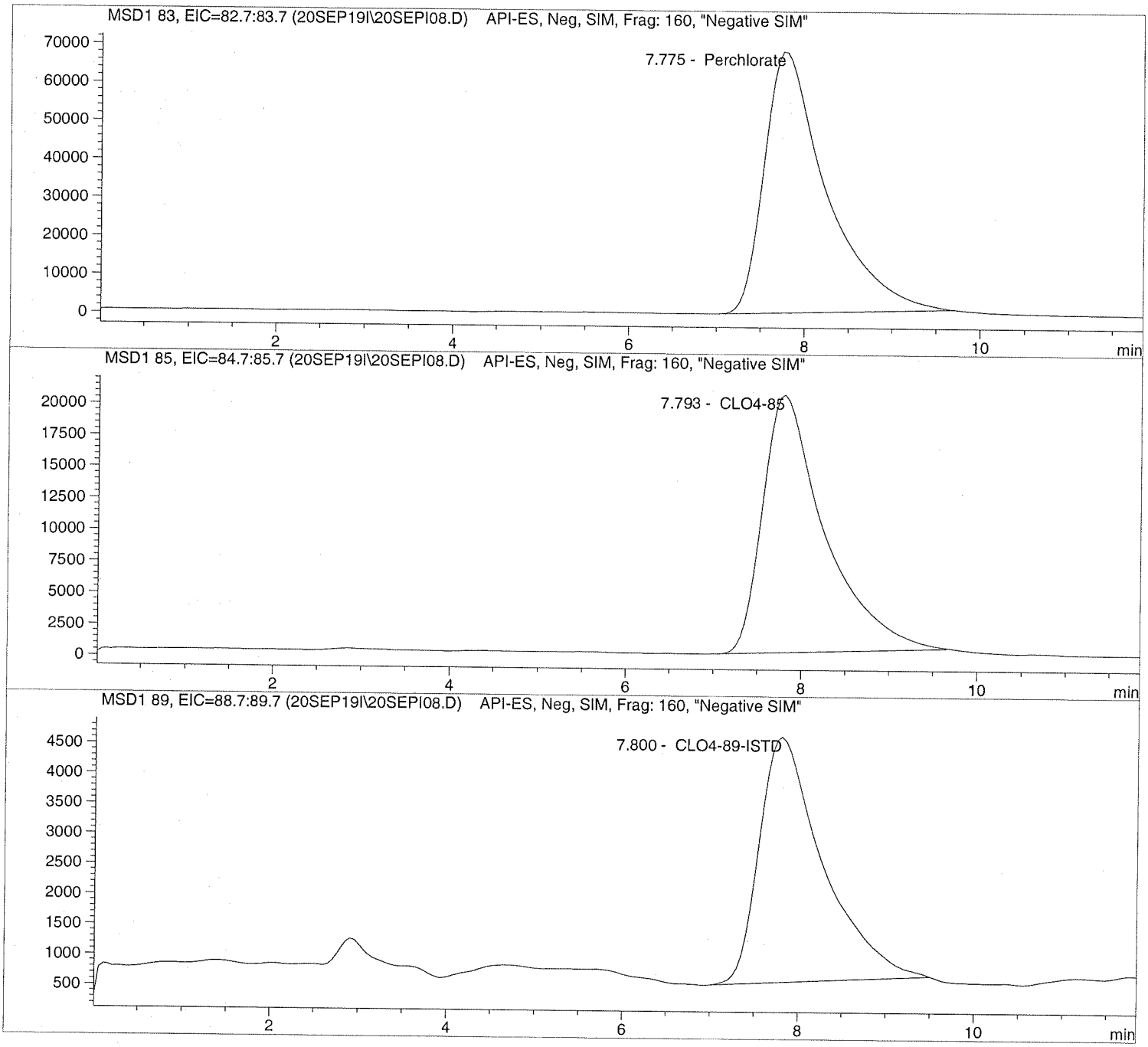
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\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

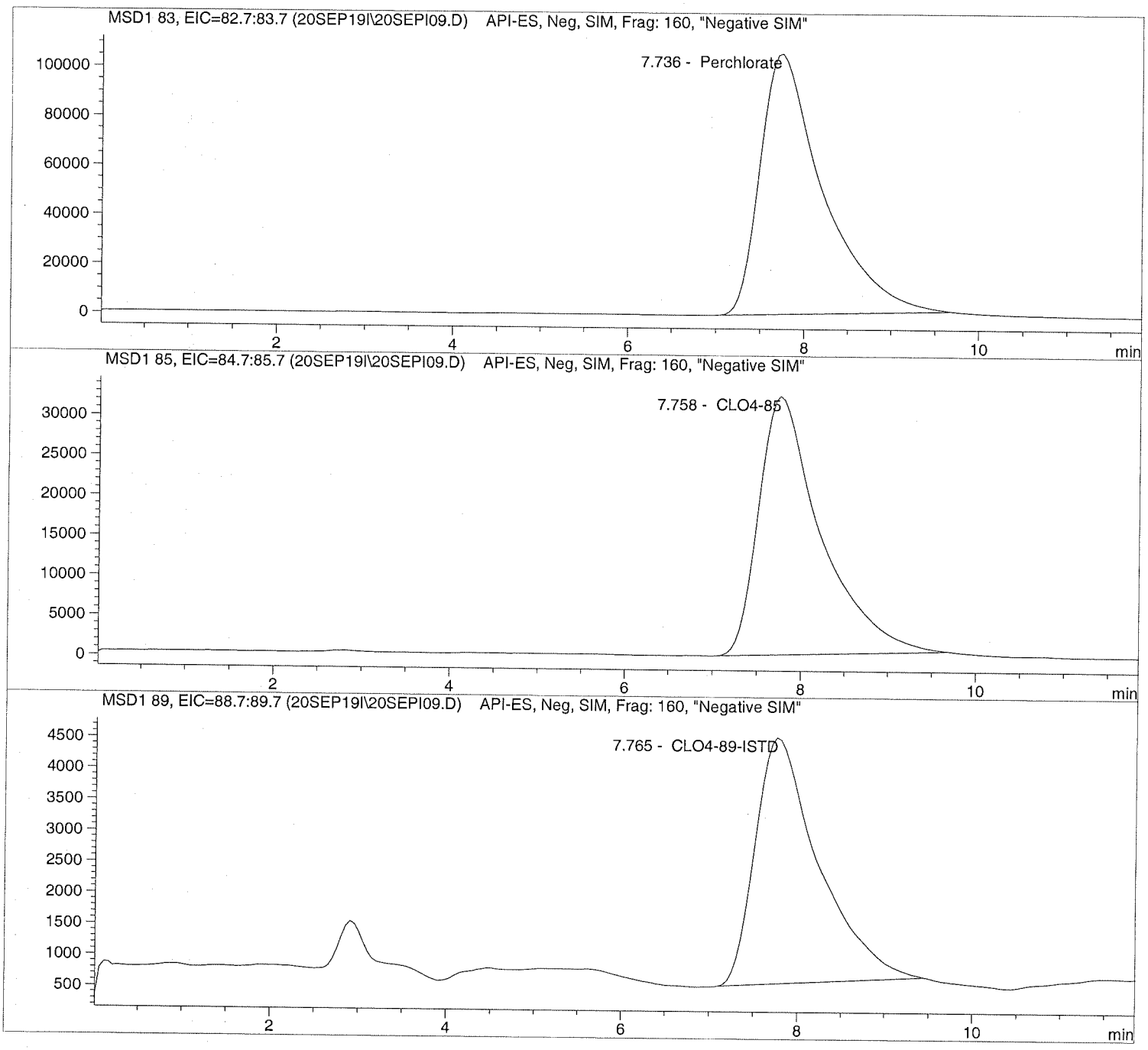
*** End of Report ***

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

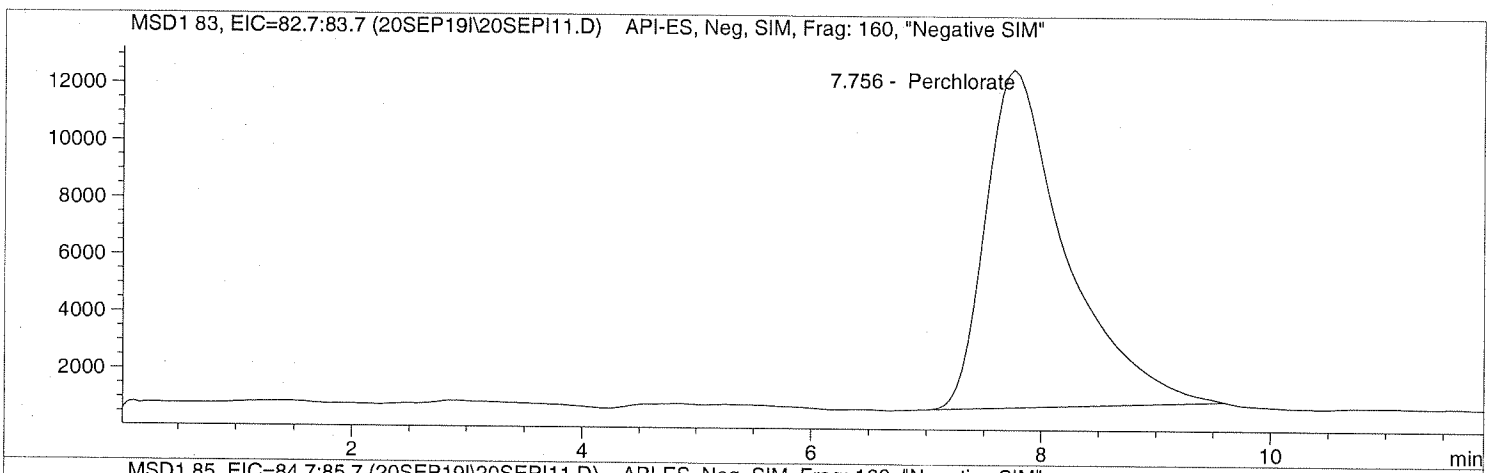
*** End of Report ***

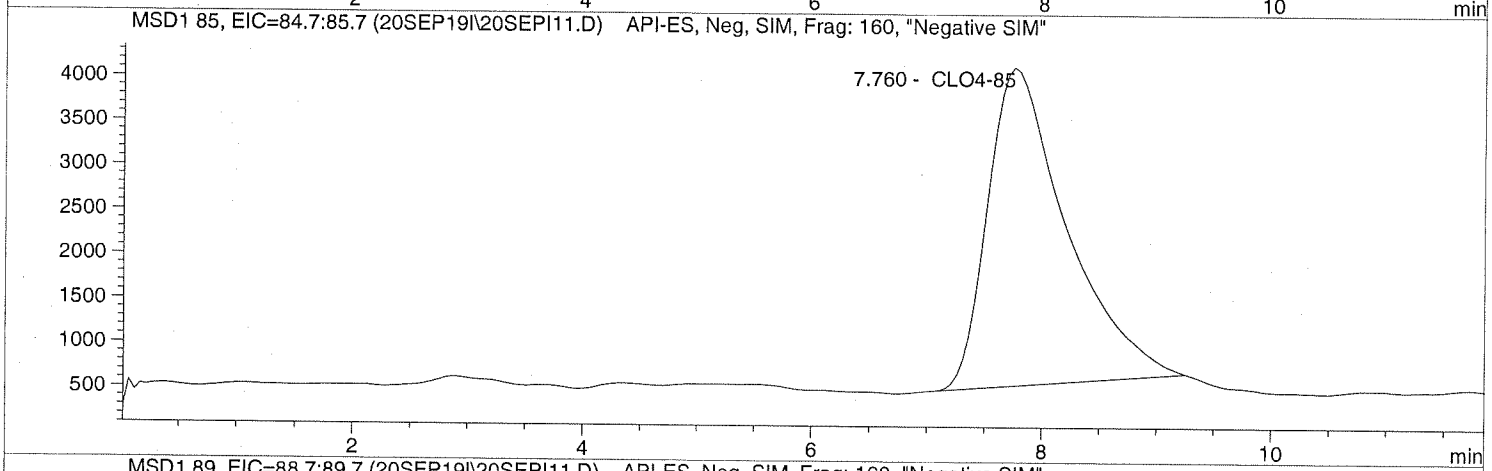
Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI11.D Sample Name: ICAL Verf@10ug/L

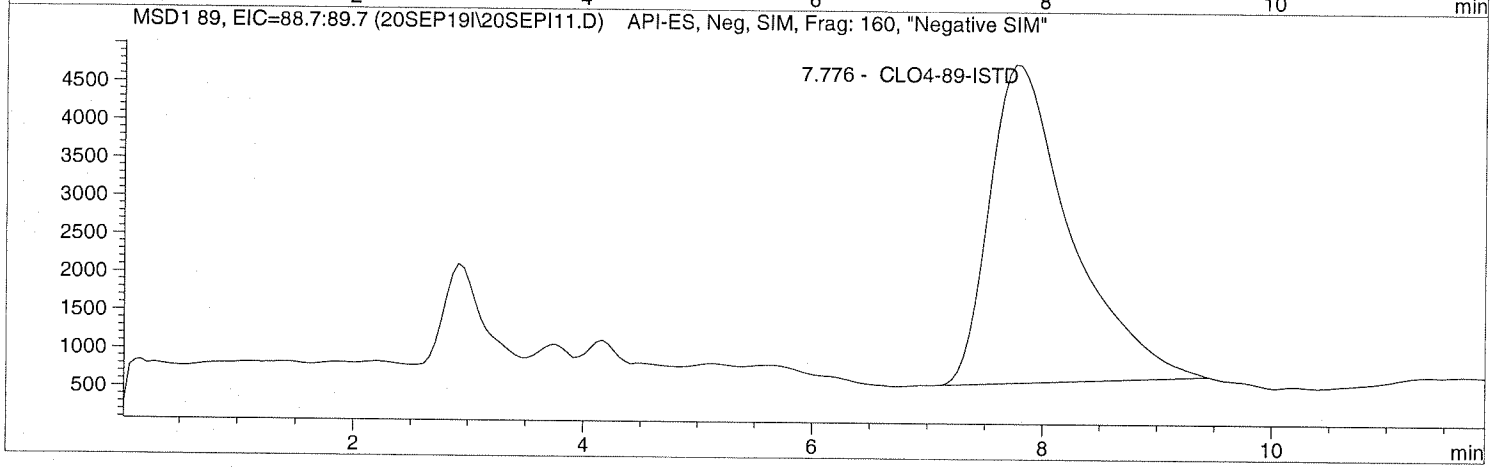
Injection Date:	9/20/2019 11:14:45	Seq Line:	11
Sample Name:	ICAL Verf@10ug/L	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

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

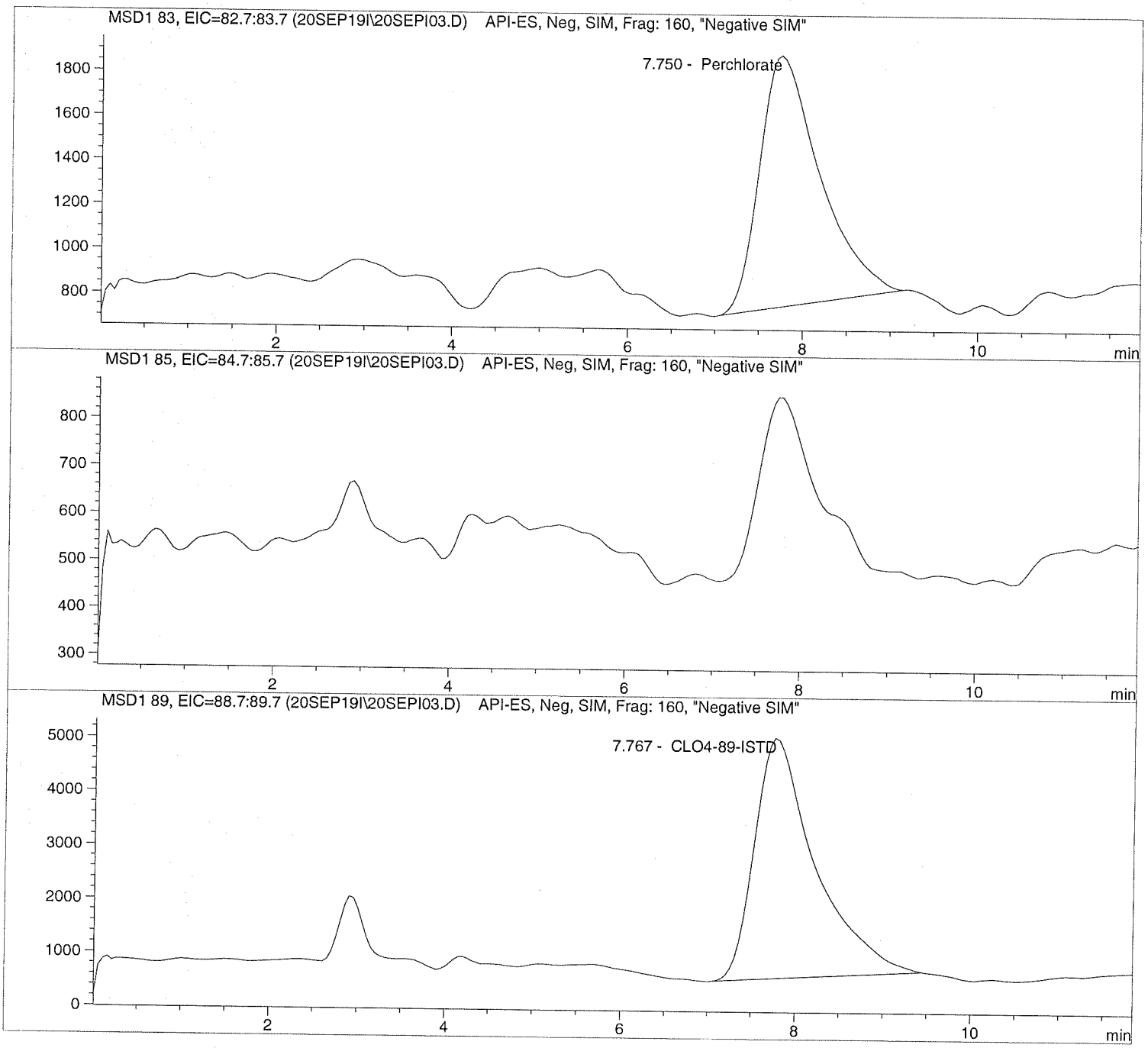
Unmodified

Data file: C:\HPCHEM\1\DATA\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

January 31, 2020

Marcia Olive
Bhate Environmental Associates, Inc.
445 Union Blvd Ste 129
Lakewood, CO 80228

Work Order: **HS20011089**

Laboratory Results for: **Longhorn GW Treatment Plant Bi Weekly Samples**

Dear Marcia,

ALS Environmental received 2 sample(s) on Jan 24, 2020 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: 31-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi Weekly Samples
Work Order: HS20011089

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS20011089-01	LH18/24-SP650_012320	Water		23-Jan-2020 14:00	24-Jan-2020 08:50	☐
HS20011089-02	Trip Blank	Water	CG-101419-10	23-Jan-2020 14:00	24-Jan-2020 08:50	☐

ALS Houston, US Date: 31-Jan-20

Client: Bhate Environmental Associates, Inc. **CASE NARRATIVE**
Project: Longhorn GW Treatment Plant Bi Weekly Samples
Work Order: HS20011089

GCMS Volatiles by Method SW8260

Batch ID: R355282

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

WetChemistry by Method SW9056

Batch ID: R355455

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

ALS Houston, US Date: 31-Jan-20

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**
Project: Longhorn GW Treatment Plant Bi Weekly Samples WorkOrder:HS20011089
Sample ID: LH18/24-SP650_012320 Lab ID:HS20011089-01
Collection Date: 23-Jan-2020 14:00 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jan-2020 19:14
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jan-2020 19:14
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jan-2020 19:14
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jan-2020 19:14
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jan-2020 19:14
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jan-2020 19:14
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jan-2020 19:14
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jan-2020 19:14
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jan-2020 19:14
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jan-2020 19:14
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jan-2020 19:14
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jan-2020 19:14
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jan-2020 19:14
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jan-2020 19:14
1,2-Dichloroethane	**1.2**		**0.20**	**0.50**	**1.0**	**UG/L**	1	28-Jan-2020 19:14
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jan-2020 19:14
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jan-2020 19:14
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jan-2020 19:14
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jan-2020 19:14
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jan-2020 19:14
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jan-2020 19:14
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	28-Jan-2020 19:14
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jan-2020 19:14
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	28-Jan-2020 19:14
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jan-2020 19:14
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jan-2020 19:14
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	28-Jan-2020 19:14
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	28-Jan-2020 19:14
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jan-2020 19:14
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jan-2020 19:14
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jan-2020 19:14
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jan-2020 19:14
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jan-2020 19:14
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jan-2020 19:14
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	28-Jan-2020 19:14
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jan-2020 19:14
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jan-2020 19:14
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jan-2020 19:14
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jan-2020 19:14

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

ALS Houston, US Date: 31-Jan-20

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**
Project: Longhorn GW Treatment Plant Bi Weekly Samples WorkOrder:HS20011089
Sample ID: LH18/24-SP650_012320 Lab ID:HS20011089-01
Collection Date: 23-Jan-2020 14:00 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	28-Jan-2020 19:14
cis-1,2-Dichloroethene	**23**		**0.20**	**0.50**	**1.0**	**UG/L**	1	28-Jan-2020 19:14
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	28-Jan-2020 19:14
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jan-2020 19:14
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jan-2020 19:14
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jan-2020 19:14
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jan-2020 19:14
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	28-Jan-2020 19:14
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jan-2020 19:14
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	28-Jan-2020 19:14
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	28-Jan-2020 19:14
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jan-2020 19:14
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jan-2020 19:14
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jan-2020 19:14
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jan-2020 19:14
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jan-2020 19:14
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jan-2020 19:14
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jan-2020 19:14
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jan-2020 19:14
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jan-2020 19:14
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jan-2020 19:14
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jan-2020 19:14
Trichloroethene	**3.7**		**0.20**	**0.50**	**1.0**	**UG/L**	1	28-Jan-2020 19:14
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jan-2020 19:14
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jan-2020 19:14
Surr: 1,2-Dichloroethane-d4	*93.1*			**0**	*81-118*	*%REC*	*1*	*28-Jan-2020 19:14*
Surr: 4-Bromofluorobenzene	*100*			**0**	*85-114*	*%REC*	*1*	*28-Jan-2020 19:14*
Surr: Dibromofluoromethane	*96.3*			**0**	*80-119*	*%REC*	*1*	*28-Jan-2020 19:14*
Surr: Toluene-d8	*111*			**0**	*89-112*	*%REC*	*1*	*28-Jan-2020 19:14*
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Chloride	**463**		**2.00**	**5.00**	**5.00**	**mg/L**	10	30-Jan-2020 21:29
Sulfate	**29.7**		**2.00**	**5.00**	**5.00**	**mg/L**	10	30-Jan-2020 21:29

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

ALS Houston, US Date: 31-Jan-20

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**

Project: Longhorn GW Treatment Plant Bi Weekly Samples WorkOrder:HS20011089

Sample ID: Trip Blank Lab ID:HS20011089-02

Collection Date: 23-Jan-2020 14:00 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jan-2020 18:50
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jan-2020 18:50
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jan-2020 18:50
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jan-2020 18:50
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jan-2020 18:50
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jan-2020 18:50
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jan-2020 18:50
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jan-2020 18:50
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jan-2020 18:50
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jan-2020 18:50
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jan-2020 18:50
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jan-2020 18:50
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jan-2020 18:50
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jan-2020 18:50
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jan-2020 18:50
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jan-2020 18:50
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jan-2020 18:50
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jan-2020 18:50
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jan-2020 18:50
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jan-2020 18:50
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jan-2020 18:50
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	28-Jan-2020 18:50
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jan-2020 18:50
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	28-Jan-2020 18:50
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jan-2020 18:50
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jan-2020 18:50
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	28-Jan-2020 18:50
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	28-Jan-2020 18:50
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jan-2020 18:50
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jan-2020 18:50
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jan-2020 18:50
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jan-2020 18:50
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jan-2020 18:50
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jan-2020 18:50
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	28-Jan-2020 18:50
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jan-2020 18:50
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jan-2020 18:50
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jan-2020 18:50
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jan-2020 18:50

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

ALS Houston, US Date: 31-Jan-20

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**
Project: Longhorn GW Treatment Plant Bi Weekly Samples WorkOrder:HS20011089
Sample ID: Trip Blank Lab ID:HS20011089-02
Collection Date: 23-Jan-2020 14:00 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	28-Jan-2020 18:50
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jan-2020 18:50
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	28-Jan-2020 18:50
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jan-2020 18:50
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jan-2020 18:50
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jan-2020 18:50
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jan-2020 18:50
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	28-Jan-2020 18:50
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jan-2020 18:50
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	28-Jan-2020 18:50
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	28-Jan-2020 18:50
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jan-2020 18:50
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jan-2020 18:50
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jan-2020 18:50
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jan-2020 18:50
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jan-2020 18:50
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jan-2020 18:50
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jan-2020 18:50
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jan-2020 18:50
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jan-2020 18:50
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jan-2020 18:50
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jan-2020 18:50
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jan-2020 18:50
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jan-2020 18:50
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jan-2020 18:50
Surr: 1,2-Dichloroethane-d4	*93.0*			**0**	*81-118*	*%REC*	*1*	*28-Jan-2020 18:50*
Surr: 4-Bromofluorobenzene	*103*			**0**	*85-114*	*%REC*	*1*	*28-Jan-2020 18:50*
Surr: Dibromofluoromethane	*96.6*			**0**	*80-119*	*%REC*	*1*	*28-Jan-2020 18:50*
Surr: Toluene-d8	*109*			**0**	*89-112*	*%REC*	*1*	*28-Jan-2020 18:50*

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

ALS Houston, US Date: 31-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi Weekly Samples
WorkOrder: HS20011089

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R355282 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Water	
HS20011089-01	LH18/24-SP650_012320	23 Jan 2020 14:00			28 Jan 2020 19:14	1
HS20011089-02	Trip Blank	23 Jan 2020 14:00			28 Jan 2020 18:50	1
Batch ID: R355455 (0)	**Test Name :** ANIONS BY SW9056A				**Matrix:** Water	
HS20011089-01	LH18/24-SP650_012320	23 Jan 2020 14:00			30 Jan 2020 21:29	10

ALS Houston, US Date: 31-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi Weekly Samples
WorkOrder: HS20011089

QC BATCH REPORT

Batch ID: R355282 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-200128** Units: **UG/L** Analysis Date: **28-Jan-2020 18:26**
Client ID: Run ID: **VOA6_355282** SeqNo: **5451784** 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: 31-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi Weekly Samples
WorkOrder: HS20011089

QC BATCH REPORT

Batch ID: R355282 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-200128** Units: **UG/L** Analysis Date: **28-Jan-2020 18:26**
Client ID: Run ID: **VOA6_355282** SeqNo: **5451784** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	1.0	2.0								U
Carbon tetrachloride	0.50	1.0								U
Chlorobenzene	0.50	1.0								U
Chloroethane	0.50	1.0								U
Chloroform	0.50	1.0								U
Chloromethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
cis-1,3-Dichloropropene	0.50	1.0								U
Dibromochloromethane	0.50	1.0								U
Dibromomethane	0.50	1.0								U
Dichlorodifluoromethane	0.50	1.0								U
Ethylbenzene	0.50	1.0								U
Hexachlorobutadiene	1.0	1.0								U
Isopropylbenzene	0.50	1.0								U
m,p-Xylene	1.0	2.0								U
Methylene chloride	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	*47.78*	*1.0*	*50*	*0*	*95.6*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*50.93*	*1.0*	*50*	*0*	*102*	*85 - 114*				
Surr: Dibromofluoromethane	*49.27*	*1.0*	*50*	*0*	*98.5*	*80 - 119*				
Surr: Toluene-d8	*54.74*	*1.0*	*50*	*0*	*109*	*89 - 112*				

ALS Houston, US Date: 31-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi Weekly Samples
WorkOrder: HS20011089

QC BATCH REPORT

Batch ID: R355282 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

LCS Sample ID: **VLCSW-200128** Units: **UG/L** Analysis Date: **28-Jan-2020 17:38**
Client ID: Run ID: **VOA6_355282** SeqNo: **5451783** 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	20.89	1.0	20	0	104	78 - 124				
1,1,1-Trichloroethane	20.76	1.0	20	0	104	74 - 131				
1,1,2,2-Tetrachloroethane	20.82	1.0	20	0	104	71 - 121				
1,1,2-Trichloroethane	20.4	1.0	20	0	102	80 - 119				
1,1-Dichloroethane	20.64	1.0	20	0	103	77 - 125				
1,1-Dichloroethene	20.29	1.0	20	0	101	71 - 131				
1,1-Dichloropropene	20.45	1.0	20	0	102	78 - 125				
1,2,3-Trichlorobenzene	25.33	1.0	20	0	127	69 - 129				
1,2,3-Trichloropropane	20.48	1.0	20	0	102	73 - 122				
1,2,4-Trichlorobenzene	22.1	1.0	20	0	110	69 - 130				
1,2,4-Trimethylbenzene	20.43	1.0	20	0	102	76 - 124				
1,2-Dibromo-3-chloropropane	21.54	1.0	20	0	108	62 - 128				
1,2-Dibromoethane	21.13	1.0	20	0	106	77 - 121				
1,2-Dichlorobenzene	20.14	1.0	20	0	101	80 - 119				
1,2-Dichloroethane	20.53	1.0	20	0	103	73 - 128				
1,2-Dichloropropane	20.36	1.0	20	0	102	78 - 122				
1,3,5-Trimethylbenzene	20.76	1.0	20	0	104	75 - 124				
1,3-Dichlorobenzene	20.54	1.0	20	0	103	80 - 119				
1,3-Dichloropropane	20.24	1.0	20	0	101	80 - 119				
1,4-Dichlorobenzene	20.18	1.0	20	0	101	79 - 118				
2,2-Dichloropropane	20.24	1.0	20	0	101	60 - 139				
2-Butanone	42.49	2.0	40	0	106	56 - 143				
2-Chlorotoluene	20.26	1.0	20	0	101	79 - 122				
2-Hexanone	41.38	2.0	40	0	103	57 - 139				
4-Chlorotoluene	20.2	1.0	20	0	101	78 - 122				
4-Isopropyltoluene	19.46	1.0	20	0	97.3	77 - 127				
4-Methyl-2-pentanone	42.29	2.0	40	0	106	67 - 130				
Acetone	43.68	2.0	40	0	109	39 - 160				
Benzene	20.58	1.0	20	0	103	79 - 120				
Bromobenzene	20.52	1.0	20	0	103	80 - 120				
Bromochloromethane	20.25	1.0	20	0	101	78 - 123				
Bromodichloromethane	20.3	1.0	20	0	102	79 - 125				
Bromoform	21.77	1.0	20	0	109	66 - 130				
Bromomethane	23.57	1.0	20	0	118	53 - 141				

ALS Houston, US Date: 31-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi Weekly Samples
WorkOrder: HS20011089

QC BATCH REPORT

Batch ID: R355282 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

LCS Sample ID: **VLCSW-200128** Units: **UG/L** Analysis Date: **28-Jan-2020 17:38**
Client ID: Run ID: **VOA6_355282** SeqNo: **5451783** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Carbon disulfide	40.62	2.0	40	0	102	64 - 133				
Carbon tetrachloride	19.55	1.0	20	0	97.7	72 - 136				
Chlorobenzene	20.63	1.0	20	0	103	82 - 118				
Chloroethane	19.98	1.0	20	0	99.9	60 - 138				
Chloroform	19.32	1.0	20	0	96.6	79 - 124				
Chloromethane	19.31	1.0	20	0	96.5	50 - 139				
cis-1,2-Dichloroethene	20.29	1.0	20	0	101	78 - 123				
cis-1,3-Dichloropropene	20.42	1.0	20	0	102	75 - 124				
Dibromochloromethane	20.71	1.0	20	0	104	74 - 126				
Dibromomethane	21.24	1.0	20	0	106	79 - 123				
Dichlorodifluoromethane	19	1.0	20	0	95.0	32 - 152				
Ethylbenzene	20.97	1.0	20	0	105	79 - 121				
Hexachlorobutadiene	23.08	1.0	20	0	115	66 - 134				
Isopropylbenzene	20.51	1.0	20	0	103	72 - 131				
m,p-Xylene	41.61	2.0	40	0	104	80 - 121				
Methylene chloride	20.59	2.0	20	0	103	74 - 124				
Naphthalene	22.76	1.0	20	0	114	61 - 128				
n-Butylbenzene	18.94	1.0	20	0	94.7	75 - 128				
n-Propylbenzene	20.32	1.0	20	0	102	76 - 126				
o-Xylene	20.65	1.0	20	0	103	78 - 122				
sec-Butylbenzene	20.2	1.0	20	0	101	77 - 126				
Styrene	21.08	1.0	20	0	105	78 - 123				
tert-Butylbenzene	20.89	1.0	20	0	104	78 - 124				
Tetrachloroethene	21.29	1.0	20	0	106	74 - 129				
Toluene	20.87	1.0	20	0	104	80 - 121				
trans-1,2-Dichloroethene	20.67	1.0	20	0	103	75 - 124				
trans-1,3-Dichloropropene	20.9	1.0	20	0	105	73 - 127				
Trichloroethene	20.32	1.0	20	0	102	79 - 123				
Trichlorofluoromethane	21.06	1.0	20	0	105	65 - 141				
Vinyl chloride	19.6	1.0	20	0	98.0	58 - 137				
Surr: 1,2-Dichloroethane-d4	*53.21*	*1.0*	*50*	*0*	*106*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*51.59*	*1.0*	*50*	*0*	*103*	*85 - 114*				
Surr: Dibromofluoromethane	*52.17*	*1.0*	*50*	*0*	*104*	*80 - 119*				
Surr: Toluene-d8	*51.58*	*1.0*	*50*	*0*	*103*	*89 - 112*				

ALS Houston, US Date: 31-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi Weekly Samples
WorkOrder: HS20011089

QC BATCH REPORT

Batch ID: R355282 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MS Sample ID: **HS20011282-01MS** Units: **UG/L** Analysis Date: **28-Jan-2020 20:02**
Client ID: Run ID: **VOA6_355282** SeqNo: **5451788** 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	20.61	1.0	20	0	103	78 - 124				
1,1,1-Trichloroethane	19.83	1.0	20	0	99.2	74 - 131				
1,1,2,2-Tetrachloroethane	19.18	1.0	20	0	95.9	71 - 121				
1,1,2-Trichloroethane	19.85	1.0	20	0	99.2	80 - 119				
1,1-Dichloroethane	18.46	1.0	20	0	92.3	77 - 125				
1,1-Dichloroethene	18.56	1.0	20	0	92.8	71 - 131				
1,1-Dichloropropene	19.53	1.0	20	0	97.6	78 - 125				
1,2,3-Trichlorobenzene	20.82	1.0	20	0	104	69 - 129				
1,2,3-Trichloropropane	19.6	1.0	20	0	98.0	73 - 122				
1,2,4-Trichlorobenzene	20.06	1.0	20	0	100	69 - 130				
1,2,4-Trimethylbenzene	21.07	1.0	20	0	105	76 - 124				
1,2-Dibromo-3-chloropropane	18.62	1.0	20	0	93.1	62 - 128				
1,2-Dibromoethane	19.59	1.0	20	0	98.0	77 - 121				
1,2-Dichlorobenzene	20.07	1.0	20	0	100	80 - 119				
1,2-Dichloroethane	19.28	1.0	20	0	96.4	73 - 128				
1,2-Dichloropropane	18.68	1.0	20	0	93.4	78 - 122				
1,3,5-Trimethylbenzene	21.42	1.0	20	0	107	75 - 124				
1,3-Dichlorobenzene	20.34	1.0	20	0	102	80 - 119				
1,3-Dichloropropane	19.64	1.0	20	0	98.2	80 - 119				
1,4-Dichlorobenzene	19.97	1.0	20	0	99.8	79 - 118				
2,2-Dichloropropane	18.81	1.0	20	0	94.0	60 - 139				
2-Butanone	35.77	2.0	40	0	89.4	56 - 143				
2-Chlorotoluene	20.57	1.0	20	0	103	79 - 122				
2-Hexanone	39.15	2.0	40	0	97.9	57 - 139				
4-Chlorotoluene	20.15	1.0	20	0	101	78 - 122				
4-Isopropyltoluene	20.48	1.0	20	0	102	77 - 127				
4-Methyl-2-pentanone	39.31	2.0	40	0	98.3	67 - 130				
Acetone	37.38	2.0	40	3.599	84.5	39 - 160				
Benzene	25.42	1.0	20	6.243	95.9	79 - 120				
Bromobenzene	19.85	1.0	20	0	99.3	80 - 120				
Bromochloromethane	18.3	1.0	20	0	91.5	78 - 123				
Bromodichloromethane	19.08	1.0	20	0	95.4	79 - 125				
Bromoform	20.01	1.0	20	0	100	66 - 130				
Bromomethane	18.7	1.0	20	0	93.5	53 - 141				

ALS Houston, US Date: 31-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi Weekly Samples
WorkOrder: HS20011089

QC BATCH REPORT

Batch ID: R355282 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MS Sample ID: **HS20011282-01MS** Units: **UG/L** Analysis Date: **28-Jan-2020 20:02**
Client ID: Run ID: **VOA6_355282** SeqNo: **5451788** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Carbon disulfide	35.84	2.0	40	0	89.6	64 - 133			
Carbon tetrachloride	19.26	1.0	20	0	96.3	72 - 136			
Chlorobenzene	20.41	1.0	20	0	102	82 - 118			
Chloroethane	16.8	1.0	20	0	84.0	60 - 138			
Chloroform	17.46	1.0	20	0	87.3	79 - 124			
Chloromethane	12.8	1.0	20	0	64.0	50 - 139			
cis-1,2-Dichloroethene	19.37	1.0	20	1.094	91.4	78 - 123			
cis-1,3-Dichloropropene	18.32	1.0	20	0	91.6	75 - 124			
Dibromochloromethane	19.9	1.0	20	0	99.5	74 - 126			
Dibromomethane	18.62	1.0	20	0	93.1	79 - 123			
Dichlorodifluoromethane	8.125	1.0	20	0	40.6	32 - 152			
Ethylbenzene	21.72	1.0	20	0.5832	106	79 - 121			
Hexachlorobutadiene	23.14	1.0	20	0	116	66 - 134			
Isopropylbenzene	21.71	1.0	20	0	109	72 - 131			
m,p-Xylene	44.95	2.0	40	2.988	105	80 - 121			
Methylene chloride	17.93	2.0	20	0	89.6	74 - 124			
Naphthalene	19.58	1.0	20	0.9274	93.3	61 - 128			
n-Butylbenzene	20.28	1.0	20	0	101	75 - 128			
n-Propylbenzene	21.54	1.0	20	0	108	76 - 126			
o-Xylene	23.01	1.0	20	2.013	105	78 - 122			
sec-Butylbenzene	21.94	1.0	20	0	110	77 - 126			
Styrene	20.72	1.0	20	0	104	78 - 123			
tert-Butylbenzene	21.96	1.0	20	0	110	78 - 124			
Tetrachloroethene	23.43	1.0	20	1.55	109	74 - 129			
Toluene	22.34	1.0	20	1.366	105	80 - 121			
trans-1,2-Dichloroethene	18.58	1.0	20	0	92.9	75 - 124			
trans-1,3-Dichloropropene	18.38	1.0	20	0	91.9	73 - 127			
Trichloroethene	19.82	1.0	20	0	99.1	79 - 123			
Trichlorofluoromethane	19.49	1.0	20	0	97.4	65 - 141			
Vinyl chloride	15.4	1.0	20	0.9017	72.5	58 - 137			
Surr: 1,2-Dichloroethane-d4	*46.71*	*1.0*	*50*	*0*	*93.4*	*81 - 118*			
Surr: 4-Bromofluorobenzene	*50.71*	*1.0*	*50*	*0*	*101*	*85 - 114*			
Surr: Dibromofluoromethane	*48.76*	*1.0*	*50*	*0*	*97.5*	*80 - 119*			
Surr: Toluene-d8	*55.04*	*1.0*	*50*	*0*	*110*	*89 - 112*			

ALS Houston, US Date: 31-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi Weekly Samples
WorkOrder: HS20011089

QC BATCH REPORT

Batch ID: R355282 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MSD Sample ID: **HS20011282-01MSD** Units: **UG/L** Analysis Date: **28-Jan-2020 20:26**
Client ID: Run ID: **VOA6_355282** SeqNo: **5451789** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	19.71	1.0	20	0	98.6	78 - 124	20.61	4.46	20	
1,1,1-Trichloroethane	18.91	1.0	20	0	94.6	74 - 131	19.83	4.75	20	
1,1,2,2-Tetrachloroethane	19.74	1.0	20	0	98.7	71 - 121	19.18	2.85	20	
1,1,2-Trichloroethane	19.66	1.0	20	0	98.3	80 - 119	19.85	0.932	20	
1,1-Dichloroethane	17.76	1.0	20	0	88.8	77 - 125	18.46	3.87	20	
1,1-Dichloroethene	17.44	1.0	20	0	87.2	71 - 131	18.56	6.19	20	
1,1-Dichloropropene	18.54	1.0	20	0	92.7	78 - 125	19.53	5.19	20	
1,2,3-Trichlorobenzene	20.62	1.0	20	0	103	69 - 129	20.82	0.981	20	
1,2,3-Trichloropropane	19.56	1.0	20	0	97.8	73 - 122	19.6	0.227	20	
1,2,4-Trichlorobenzene	19.04	1.0	20	0	95.2	69 - 130	20.06	5.25	20	
1,2,4-Trimethylbenzene	20.91	1.0	20	0	105	76 - 124	21.07	0.771	20	
1,2-Dibromo-3-chloropropane	18.43	1.0	20	0	92.2	62 - 128	18.62	1.03	20	
1,2-Dibromoethane	20.01	1.0	20	0	100	77 - 121	19.59	2.13	20	
1,2-Dichlorobenzene	20.02	1.0	20	0	100	80 - 119	20.07	0.228	20	
1,2-Dichloroethane	18.72	1.0	20	0	93.6	73 - 128	19.28	2.99	20	
1,2-Dichloropropane	18.26	1.0	20	0	91.3	78 - 122	18.68	2.24	20	
1,3,5-Trimethylbenzene	21.23	1.0	20	0	106	75 - 124	21.42	0.867	20	
1,3-Dichlorobenzene	20.48	1.0	20	0	102	80 - 119	20.34	0.676	20	
1,3-Dichloropropane	19.28	1.0	20	0	96.4	80 - 119	19.64	1.82	20	
1,4-Dichlorobenzene	19.85	1.0	20	0	99.2	79 - 118	19.97	0.592	20	
2,2-Dichloropropane	17.62	1.0	20	0	88.1	60 - 139	18.81	6.52	20	
2-Butanone	34.6	2.0	40	0	86.5	56 - 143	35.77	3.34	20	
2-Chlorotoluene	20.3	1.0	20	0	102	79 - 122	20.57	1.34	20	
2-Hexanone	36.77	2.0	40	0	91.9	57 - 139	39.15	6.27	20	
4-Chlorotoluene	20.29	1.0	20	0	101	78 - 122	20.15	0.698	20	
4-Isopropyltoluene	20.08	1.0	20	0	100	77 - 127	20.48	1.98	20	
4-Methyl-2-pentanone	38.71	2.0	40	0	96.8	67 - 130	39.31	1.56	20	
Acetone	36.52	2.0	40	3.599	82.3	39 - 160	37.38	2.33	20	
Benzene	24.38	1.0	20	6.243	90.7	79 - 120	25.42	4.18	20	
Bromobenzene	20.12	1.0	20	0	101	80 - 120	19.85	1.34	20	
Bromochloromethane	17.19	1.0	20	0	86.0	78 - 123	18.3	6.23	20	
Bromodichloromethane	18.58	1.0	20	0	92.9	79 - 125	19.08	2.66	20	
Bromoform	19.86	1.0	20	0	99.3	66 - 130	20.01	0.738	20	
Bromomethane	16.85	1.0	20	0	84.3	53 - 141	18.7	10.4	20	

ALS Houston, US Date: 31-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi Weekly Samples
WorkOrder: HS20011089

QC BATCH REPORT

Batch ID: R355282 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MSD Sample ID: **HS20011282-01MSD** Units: **UG/L** Analysis Date: **28-Jan-2020 20:26**
Client ID: Run ID: **VOA6_355282** SeqNo: **5451789** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Carbon disulfide	33.19	2.0	40	0	83.0	64 - 133	35.84	7.67	20	
Carbon tetrachloride	18.46	1.0	20	0	92.3	72 - 136	19.26	4.26	20	
Chlorobenzene	19.59	1.0	20	0	97.9	82 - 118	20.41	4.09	20	
Chloroethane	16.69	1.0	20	0	83.5	60 - 138	16.8	0.613	20	
Chloroform	17.03	1.0	20	0	85.1	79 - 124	17.46	2.51	20	
Chloromethane	12	1.0	20	0	60.0	50 - 139	12.8	6.45	20	
cis-1,2-Dichloroethene	18.59	1.0	20	1.094	87.5	78 - 123	19.37	4.07	20	
cis-1,3-Dichloropropene	18.33	1.0	20	0	91.7	75 - 124	18.32	0.0756	20	
Dibromochloromethane	19.17	1.0	20	0	95.8	74 - 126	19.9	3.74	20	
Dibromomethane	18.61	1.0	20	0	93.0	79 - 123	18.62	0.0554	20	
Dichlorodifluoromethane	7.541	1.0	20	0	37.7	32 - 152	8.125	7.46	20	
Ethylbenzene	20.69	1.0	20	0.5832	101	79 - 121	21.72	4.85	20	
Hexachlorobutadiene	21.28	1.0	20	0	106	66 - 134	23.14	8.38	20	
Isopropylbenzene	20.75	1.0	20	0	104	72 - 131	21.71	4.55	20	
m,p-Xylene	43.35	2.0	40	2.988	101	80 - 121	44.95	3.63	20	
Methylene chloride	17.34	2.0	20	0	86.7	74 - 124	17.93	3.33	20	
Naphthalene	20	1.0	20	0.9274	95.3	61 - 128	19.58	2.12	20	
n-Butylbenzene	20.13	1.0	20	0	101	75 - 128	20.28	0.734	20	
n-Propylbenzene	21.4	1.0	20	0	107	76 - 126	21.54	0.662	20	
o-Xylene	22.53	1.0	20	2.013	103	78 - 122	23.01	2.1	20	
sec-Butylbenzene	21.74	1.0	20	0	109	77 - 126	21.94	0.931	20	
Styrene	20.11	1.0	20	0	101	78 - 123	20.72	2.99	20	
tert-Butylbenzene	21.44	1.0	20	0	107	78 - 124	21.96	2.44	20	
Tetrachloroethene	22.03	1.0	20	1.55	102	74 - 129	23.43	6.19	20	
Toluene	21.45	1.0	20	1.366	100	80 - 121	22.34	4.06	20	
trans-1,2-Dichloroethene	17.78	1.0	20	0	88.9	75 - 124	18.58	4.36	20	
trans-1,3-Dichloropropene	18.53	1.0	20	0	92.7	73 - 127	18.38	0.812	20	
Trichloroethene	19.47	1.0	20	0	97.3	79 - 123	19.82	1.81	20	
Trichlorofluoromethane	17.99	1.0	20	0	89.9	65 - 141	19.49	8.01	20	
Vinyl chloride	14.06	1.0	20	0.9017	65.8	58 - 137	15.4	9.1	20	
Surr: 1,2-Dichloroethane-d4	*47.11*	*1.0*	*50*	*0*	*94.2*	*81 - 118*	*46.71*	*0.859*	*20*	
Surr: 4-Bromofluorobenzene	*51.16*	*1.0*	*50*	*0*	*102*	*85 - 114*	*50.71*	*0.88*	*20*	
Surr: Dibromofluoromethane	*48.44*	*1.0*	*50*	*0*	*96.9*	*80 - 119*	*48.76*	*0.652*	*20*	
Surr: Toluene-d8	*55.11*	*1.0*	*50*	*0*	*110*	*89 - 112*	*55.04*	*0.125*	*20*	

ALS Houston, US Date: 31-Jan-20

Client:	Bhate Environmental Associates, Inc.
Project:	Longhorn GW Treatment Plant Bi Weekly Samples
WorkOrder:	HS20011089

QC BATCH REPORT

Batch ID:	**R355282 (0)**	**Instrument:**	**VOA6**	**Method:**	**VOLATILES ORGANICS BY METHOD 8260C**

The following samples were analyzed in this batch:	HS20011089-01	HS20011089-02

ALS Houston, US Date: 31-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi Weekly Samples
WorkOrder: HS20011089

QC BATCH REPORT

Batch ID: R355455 (0) **Instrument: ICS2100** **Method: ANIONS BY SW9056A**

MBLK Sample ID: **WBLKW1-013020** Units: **mg/L** Analysis Date: **30-Jan-2020 16:01**
Client ID: Run ID: **ICS2100_355455** SeqNo: **5455478** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	0.500	0.500								U
Sulfate	0.222	0.500								J

LCS Sample ID: **WLCSW1-013020** Units: **mg/L** Analysis Date: **30-Jan-2020 16:16**
Client ID: Run ID: **ICS2100_355455** SeqNo: **5455479** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	19.92	0.500	20	0	99.6	80 - 120				
Sulfate	19.68	0.500	20	0	98.4	80 - 120				

LCSD Sample ID: **WLCSDW1-013020** Units: **mg/L** Analysis Date: **30-Jan-2020 16:30**
Client ID: Run ID: **ICS2100_355455** SeqNo: **5455480** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	19.99	0.500	20	0	99.9	80 - 120	19.92	0.356	20	
Sulfate	19.71	0.500	20	0	98.5	80 - 120	19.68	0.147	20	

MS Sample ID: **HS20011246-19MS** Units: **mg/L** Analysis Date: **30-Jan-2020 21:00**
Client ID: Run ID: **ICS2100_355455** SeqNo: **5455484** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	407.6	5.00	100	313.2	94.4	80 - 120				
Sulfate	188.3	5.00	100	92.39	96.0	80 - 120				

MSD Sample ID: **HS20011246-19MSD** Units: **mg/L** Analysis Date: **30-Jan-2020 21:15**
Client ID: Run ID: **ICS2100_355455** SeqNo: **5455485** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	408	5.00	100	313.2	94.7	80 - 120	407.6	0.0829	20	
Sulfate	189.2	5.00	100	92.39	96.8	80 - 120	188.3	0.44	20	

The following samples were analyzed in this batch: HS20011089-01

ALS Houston, US Date: 31-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi Weekly Samples
WorkOrder: **HS20011089**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

Unit Reported	Description
mg/L	Milligrams per Liter

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	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	624-2020	31-Dec-2020
North Dakota	R-193 2019-2020	30-Apr-2020
Oklahoma	2019-067	31-Aug-2020
Texas	T104704231-19-25	30-Apr-2020

ALS Houston, US Date: 31-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi Weekly Samples
Work Order: HS20011089

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS20011089-01	LH18/24-SP650_012320	Login	1/24/2020 11:05:11 AM	PMG	WET036
HS20011089-01	LH18/24-SP650_012320	Login	1/24/2020 11:05:11 AM	PMG	VOA122
HS20011089-02	Trip Blank	Login	1/24/2020 11:05:11 AM	PMG	VOA122

ALS Houston, US Date: 31-Jan-20

Sample Receipt Checklist

Client Name: Bhate Environmental
Work Order: HS20011089
Date/Time Received: **24-Jan-2020 08:50**
Received by: **AC**

Checklist completed by: *Paresh M. Giga* eSignature 24-Jan-2020 Date
Reviewed by: *RJ Modashia* eSignature 24-Jan-2020 Date

Matrices: **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):	2.4c U/C	IR25
Cooler(s)/Kit(s):	44463	
Date/Time sample(s) sent to storage:	1/24/2020 11:15	

Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

00968891

CHAIN OF CUSTODY

Name Of Lab Shipping To: ALS 10450 Stancliff Rd. Suite 210, Houston, Tx. 77099 ATTN: R.J. Modashia

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

Project No. NWO1312.0150.0 16.0001

Job:
GROUNDWATER TREATMENT PLANT BI-WEEKLY SAMPLES

Prepared By: Scott Beesinger

P.O Number

HS20011089
Bhate Environmental Associates. Inc.
Longhorn GW Treatment Plant Bi Weekly Samples

Field Sample I.D.	Sample Matrix	Date / Time	MS / MSD	No. OF CONTAINERS	Analyses: VOC	Analyses: CHLORIDE, SULFATE	Remarks (Preservatives, etc.)	Lab I.D.#
LH18/24-SP650_012320	Water	01/23/20 / 14:00		3	3		HCL	
LH18/24-SP650_012320	Water	01/23/20 / 14:00		1		1	NONE	
Trip Blank	Water	01/23/20		2	2		HCL	

Additional Remarks: Standard TAT on Chloride & Sulfate. 24 Hour TAT on VOC

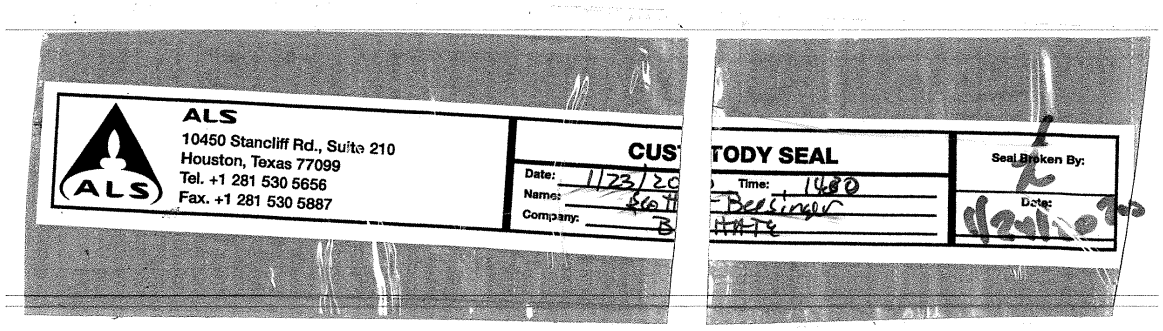
Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
Scott Beesinger	01/23/20	14:30									

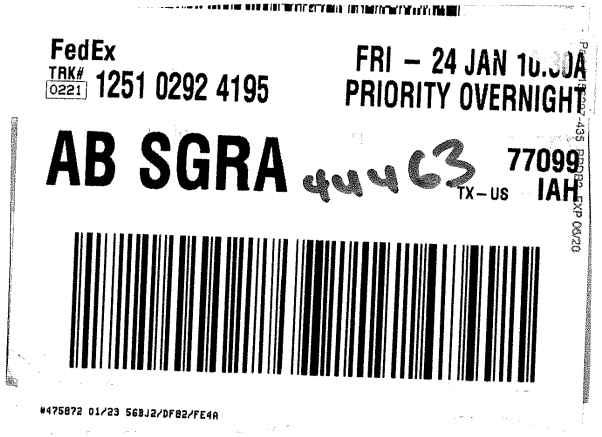
9For Lab Use Only

Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition
AC	1/24/2020	08:50							

Remarks
VIC 2.4 IRH25 CF0.0 44463

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


ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887
Date:
Name:
Company:
TODY SEAL
Time:
Seal Broken By:
Date:


FedEx
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FRI – 24 JAN
PRIORITY OVERNIGHT
AB SGRA
77099
TX – US
IAH
#475872 01/23 56BJ2/DFB2/FE4A

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
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February 19, 2020

Marcia Olive
Bhate Environmental Associates, Inc.
445 Union Blvd Ste 129
Lakewood, CO 80228

Work Order: **HS20011091**

Laboratory Results for: **Longhorn GW Treatment Plant Weekly Samples**

Dear Marcia,

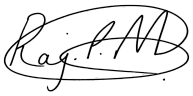
ALS Environmental received 2 sample(s) on Jan 24, 2020 for the analysis presented in the following report.

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: 19-Feb-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Weekly Samples
Work Order: HS20011091

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS20011091-01	LH18/24-SP650_012320	Water		23-Jan-2020 14:00	24-Jan-2020 08:50	☐
HS20011091-02	LH18/24-SP650_012320_BIX	Water		23-Jan-2020 14:00	24-Jan-2020 08:50	☐

ALS Houston, US Date: 19-Feb-20

Client: Bhate Environmental Associates, Inc. **CASE NARRATIVE**
Project: Longhorn GW Treatment Plant Weekly Samples
Work Order: HS20011091

Work Order Comments

- The analysis for Perchlorate were subcontracted to ALS High Res Lab Houston, TX. Final report attached.

  The analysis for TOC was subcontracted to ALS Kelso, WA. Final report attached.

WetChemistry by Method E365.3

Batch ID: R355308

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

WetChemistry by Method E350.3

Batch ID: R355203

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

ALS Houston, US Date: 19-Feb-20

Client: Bhate Environmental Associates, Inc.
ANALYTICAL REPORT
Project: Longhorn GW Treatment Plant Weekly Samples
WorkOrder:HS20011091
Sample ID: LH18/24-SP650_012320
Lab ID:HS20011091-01
Collection Date: 23-Jan-2020 14:00
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
AMMONIA AS N BY E350.3(ISE)		**Method:E350.3**						Analyst: RG
Nitrogen, Ammonia (As N)	**9.1**	a	**0.20**	**0.10**	**0.20**	**mg/L**	1	28-Jan-2020 14:00
ORTHO PHOSPHATE (PO4) AS P BY E365.3		**Method:E365.3**						Analyst: JHD
Phosphorus, Total Orthophosphate (As P)	**1.96**	a	**0.100**	**0.250**	**0.250**	**mg/L**	10	24-Jan-2020 15:27
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	05-Feb-2020 15:19

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

ALS Houston, US Date: 19-Feb-20

Client: Bhate Environmental Associates, Inc.
ANALYTICAL REPORT
Project: Longhorn GW Treatment Plant Weekly Samples
WorkOrder:HS20011091
Sample ID: LH18/24-SP650_012320_BIX
Lab ID:HS20011091-02
Collection Date: 23-Jan-2020 14:00
Matrix:Water

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	19-Feb-2020 09:33

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

ALS Houston, US Date: 19-Feb-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Weekly Samples
WorkOrder: HS20011091

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R355203 (0)	**Test Name :** AMMONIA AS N BY E350.3(ISE)				**Matrix:** Water	
HS20011091-01	LH18/24-SP650_012320	23 Jan 2020 14:00			28 Jan 2020 14:00	1
Batch ID: R355308 (0)	**Test Name :** ORTHO PHOSPHATE (PO4) AS P BY E365.3				**Matrix:** Water	
HS20011091-01	LH18/24-SP650_012320	23 Jan 2020 14:00			24 Jan 2020 15:27	10
Batch ID: R355729 (0)	**Test Name :** SUBCONTRACT ANALYSIS - TOC ANALYSIS				**Matrix:** Water	
HS20011091-01	LH18/24-SP650_012320	23 Jan 2020 14:00			05 Feb 2020 15:19	1
Batch ID: R356527 (0)	**Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)				**Matrix:** Water	
HS20011091-02	LH18/24-SP650_012320_BIX	23 Jan 2020 14:00			19 Feb 2020 09:33	1

ALS Houston, US Date: 19-Feb-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Weekly Samples
WorkOrder: HS20011091

QC BATCH REPORT

Batch ID: R355203 (0) **Instrument: WetChem_HS** **Method: AMMONIA AS N BY E350.3(ISE)**

MBLK Sample ID: **MBLK-R355203** Units: **mg/L** Analysis Date: **28-Jan-2020 14:00**
Client ID: Run ID: **WetChem_HS_355203** SeqNo: **5450350** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Ammonia (As N)	0.10	0.20								U

LCS Sample ID: **LCS-R355203** Units: **mg/L** Analysis Date: **28-Jan-2020 14:00**
Client ID: Run ID: **WetChem_HS_355203** SeqNo: **5450349** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Ammonia (As N)	10.09	0.20	10	0	101	85 - 115				

MS Sample ID: **HS20010749-01MS** Units: **mg/L** Analysis Date: **28-Jan-2020 14:00**
Client ID: Run ID: **WetChem_HS_355203** SeqNo: **5450352** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Ammonia (As N)	10.09	0.20	10	0.101	99.9	80 - 120				

MSD Sample ID: **HS20010749-01MSD** Units: **mg/L** Analysis Date: **28-Jan-2020 14:00**
Client ID: Run ID: **WetChem_HS_355203** SeqNo: **5450351** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Ammonia (As N)	10.14	0.20	10	0.101	100	80 - 120	10.09	0.475	20	

The following samples were analyzed in this batch: HS20011091-01

ALS Houston, US Date: 19-Feb-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Weekly Samples
WorkOrder: HS20011091

QC BATCH REPORT

Batch ID: R355308 (0) **Instrument:** UV-2450 **Method:** ORTHO PHOSPHATE (PO4) AS P BY E365.3

MBLK Sample ID: **MBLK-R355308** Units: **mg/L** Analysis Date: **24-Jan-2020 15:27**
Client ID: Run ID: **UV-2450_355308** SeqNo: **5452137** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total Orthophosphate (As P)	0.0250	0.0250								U

LCS Sample ID: **LCS-R355308** Units: **mg/L** Analysis Date: **24-Jan-2020 15:27**
Client ID: Run ID: **UV-2450_355308** SeqNo: **5452136** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total Orthophosphate (As P)	0.225	0.0250	0.25	0	90.0	85 - 115				

MS Sample ID: **HS20011091-01MS** Units: **mg/L** Analysis Date: **24-Jan-2020 15:27**
Client ID: **LH18/24-SP650_012320** Run ID: **UV-2450_355308** SeqNo: **5452139** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total Orthophosphate (As P)	4.31	0.250	2.5	1.96	94.0	80 - 120				

MSD Sample ID: **HS20011091-01MSD** Units: **mg/L** Analysis Date: **24-Jan-2020 15:27**
Client ID: **LH18/24-SP650_012320** Run ID: **UV-2450_355308** SeqNo: **5452138** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total Orthophosphate (As P)	4.29	0.250	2.5	1.96	93.2	80 - 120	4.31	0.465	20	

The following samples were analyzed in this batch: HS20011091-01

ALS Houston, US Date: 19-Feb-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Weekly Samples
WorkOrder: **HS20011091**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	19-028-0	27-Mar-2020
California	2919, 2019-2020	30-Apr-2020
Dept of Defense	ANAB L2231 V009	22-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	624-2020	31-Dec-2020
North Dakota	R-193 2019-2020	30-Apr-2020
Oklahoma	2019-067	31-Aug-2020
Texas	T104704231-19-25	30-Apr-2020

ALS Houston, US Date: 19-Feb-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Weekly Samples
Work Order: HS20011091

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS20011091-01	LH18/24-SP650_012320	Login	1/24/2020 11:20:39 AM	PMG	WET243
HS20011091-01	LH18/24-SP650_012320	Login	1/24/2020 11:20:39 AM	PMG	WET243
HS20011091-01	LH18/24-SP650_012320	Login	1/24/2020 11:20:39 AM	PMG	Sub
HS20011091-02	LH18/24-SP650_012320_BIX	Login	1/24/2020 11:20:39 AM	PMG	Sub

ALS Houston, US Date: 19-Feb-20

Sample Receipt Checklist

Client Name: Bhate Environmental
Work Order: HS20011091
Date/Time Received: **24-Jan-2020 08:50**
Received by: **AC**

Checklist completed by: *Paresh M. Giga* 24-Jan-2020
eSignature | Date

Reviewed by: _____
eSignature | Date

Matrices: **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 ☐	
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):	2.4c U/C	IR25
Cooler(s)/Kit(s):	44463	
Date/Time sample(s) sent to storage:	1/24/2020 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:

CHAIN OF CUSTODY

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

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

Project No. NWO1312.0150.0 16.0001

Job:
GROUNDWATER TREATMENT PLANT WEEKLY SAMPLES

Prepared By: Scott Beesinger

P.O. Number

HS20011091
Bhate Environmental Associates. Inc.
Longhorn GW Treatment Plant Weekly Samples

Field Sample I.D.	Sample Matrix	Date / Time	MS / MSD	No. OF CONTAINERS	Analyses: AMMONIA-N	TOTAL ORGANIC CARBON	ORTHO-PHOSPHATE	PERCHLORATE	Remarks (Preservatives, etc.)	Lab I.D.#
LH18/24-SP650_012320	Water	01/23/20 / 14:00		3	X	X			H2SO4	
LH18/24-SP650_012320	Water	01/23/20 / 14:00		1			X		NONE	
LH18/24–SP650_012320_BIX	Water	01/23/20 / 14:00		1				X	NONE	

Additional Remarks: **Standard TAT on all parameters**

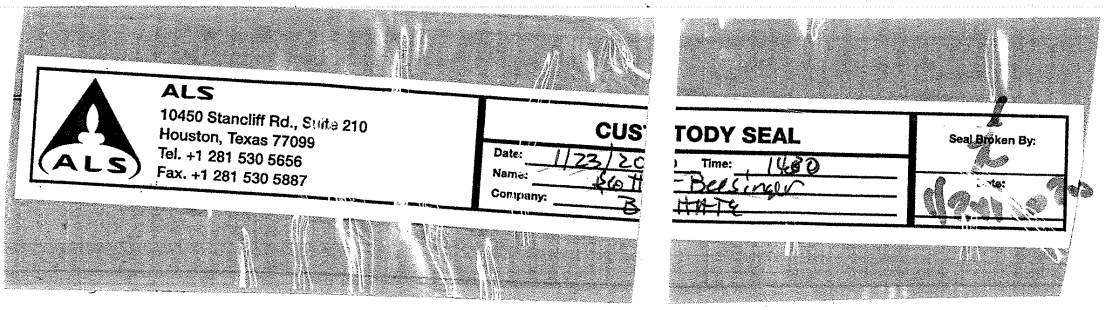
Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
Scott Beesinger	01/23/20	14:30									

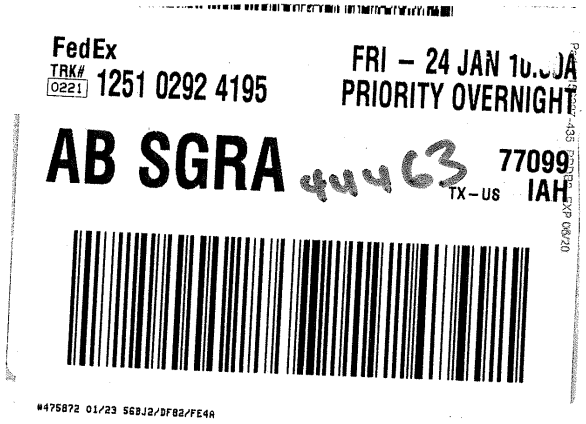
For Lab Use Only

Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition
AC	1/24/2020	08:50							

Remarks: U/C 2.4 IR#25 CF0.0 44463

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


ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887
CUS
Date: 1/23/2
Name:
Company:
TODY SEAL
Time: 1480
Seal Broken By:


FedEx
TRK# 0221 1251 0292 4195
FRI – 24 JAN
PRIORITY OVERNIGHT
AB SGRA 44463
77099
TX-US IAH
#475872 01/23 5GBJ2/DF82/FE4A

February 18, 2020 Service Request No:E2000074

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

Laboratory Results for: HS20011091

Dear RJ,

Enclosed are the results of the sample(s) submitted to our laboratory January 27, 2020
For your reference, these analyses have been assigned our service request number **E2000074.**

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current TNI standards, where applicable, and except as noted in the laboratory case narrative provided. All results are intended to be considered in their entirety and ALS Environmental is not responsible for use of less than the complete final report. Results apply only to the items submitted to the laboratory, as received for analysis. In accordance with the current TNI Standard, a statement on the estimated uncertainty of measurement of any quantitative analysis will be supplied upon request.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Corey Grandits
Project Manager

ADDRESS 10450 Stancliff Rd., Suite 210, Houston, TX 77099
PHONE +1 281 530 5656 | FAX +1 281 530 5887
ALS Group USA, Corp.
dba ALS Environmental

Certificate of Analysis

ALS Environmental - Houston HRMS
10450 Stancliff Rd, Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

ALS Environmental

Client:	ALS Houston	**Service Request No.:**	E2000074
Project:	HS20011091	**Date Received:**	01/27/20
Sample Matrix:	W		

CASE NARRATIVE

All analyses were performed in adherence to the quality assurance program of ALS Environmental. This report contains analytical results for samples designated for Tier IV. When appropriate to the method, method blank results have been reported with each analytical test.

Sample Receipt

One sample was received for analysis at ALS Environmental in Houston on 01/27/20.

The sample was received in good condition and is consistent with the accompanying chain of custody form. The sample was stored in a refrigerator at 4°C upon receipt at the laboratory.

Data Validation Notes and Discussion

Precision and Accuracy:

EQ2000051: Laboratory Control Spike/Duplicate Laboratory Control Spike (LCS/DLCS) samples were analyzed and reported in lieu of a MS/MSD for this extraction batch. The LCS and DLCS recoveries are within QC limits.

The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and ALS Environmental (ALS) is not responsible for utilization of less than the complete report.

Use of ALS group USA Corp dba ALS Environmental (ALS)'s Name. Client shall not use ALS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to ALS any test result, tolerance or specification derived from ALS's data ("Attribution") without ALS's prior written consent, which may be withheld by ALS for any reason in its sole discretion. To request ALS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If ALS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use ALS's name or trademark in any Materials or Attribution shall be deemed denied. ALS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of ALS's name or trademark may cause ALS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.

Client: ALS Environmental - US **Service Request:**E2000074
Project: HS20011091

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
E2000074-001	LH18/24-SP650_12320_BIX	1/23/2020	1400

Service Request Summary

Folder #: **E2000074**
Client Name: ALS Environmental - US
Project Name: HS20011091
Project Number:

Report To: RJ Modashia
ALS Laboratory Group
10450 Stancliff Road
Houston, TX 77099-4338
USA
Phone Number: 281-530-5656
Cell Number:
Fax Number: 281-530-5887
E-mail: rj.modashia@alsglobal.com

Project Chemist: Corey Grandits
Originating Lab: HOUSTON
Logged By: CGRANDITS
Date Received: 01/27/20
Internal Due Date: 2/7/2020
QAP: LAB QAP
Qualifier Set: Lab Standard
Formset: Lab Standard
Merged?: Y
Report to MDL?: Y
P.O. Number: HS20011091
EDD: No EDD Specified

1 250 mL-Plastic Bottle HDPE WM CLEAR Unpreserved
Location: EHRMS-WIC 5E
Pressure Gas:

Lab Samp No.	Client Samp No	Matrix	Collected	HOUSTON ClO4 DOD/6850
E2000074-001	LH18/24-SP650_12320_BIX	Water	01/23/20 1400	**IV**

Service Request Summary

Folder #:	**E2000074**
Client Name:	ALS Environmental - US
Project Name:	HS20011091
Project Number:	

Report To:	RJ Modashia ALS Laboratory Group 10450 Stancliff Road Houston, TX 77099-4338 USA
Phone Number:	281-530-5656
Cell Number:	
Fax Number:	281-530-5887
E-mail:	rj.modashia@alsglobal.com

Project Chemist:	Corey Grandits
Originating Lab:	HOUSTON
Logged By:	CGRANDITS
Date Received:	01/27/20
Internal Due Date:	2/7/2020
QAP:	LAB QAP
Qualifier Set:	Lab Standard
Formset:	Lab Standard
Merged?:	Y
Report to MDL?:	Y
P.O. Number:	HS20011091
EDD:	No EDD Specified

1 250 mL-Plastic Bottle HDPE WM CLEAR Unpreserved

Location: EHRMS-WIC 5E

Pressure Gas:

Data Qualifiers

Lab Standard

+	Possible Tedlar bag artifact.
A	TIC is a suspected aldol-condensation product
B	Analyte found in the associated method blank as well as in the sample.
BC	Reported results are not blank corrected.
BH	The back section of the tube yielded higher results than the front.
BT	Results indicated possible breakthrough; back section >=10% front section.
C	Result identification confirmed.
D	Compound identified in an analysis at a secondary dilution factor
D	Spike was diluted out
DE	Reported results are corrected for desorption efficiency.
E	Estimated value. Concentration above calibration range
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
H1	Sample analysis performed past holding time. See case narrative.
H2	Initial analysis within holding time. Reanalysis for the required dilution was past holding time.
H3	Sample was received and analyzed past holding time.
H4	Sample was extracted past required extraction holding time, but analyzed within analysis holding time. See case narrative.
I	Internal standard not within the specified limits. See case narrative.
J	Estimated Value. Concentration found below MRL.
K	A deflection in the QC ion may indicate interference with the quantitation of this ion. The concentration of this analyte should be considered as an estimate.
K	Analyte was detected above the method reporting limit prior to normalization.
L1	Laboratory control sample recovery outside the specified limits; results may be biased high.
L2	Laboratory control sample recovery outside the specified limits; results may be biased low.
L3	Laboratory control sample recovery outside the specified limits.
M	Matrix interference; results may be biased high.
M	The duplicate injection precision not met.
M1	Matrix interference due to coelution with a non-target compound; results may be biased high.
N	Presumptive evidence of a compound for TICs that have been identified based on a mass spectral library search.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.
P	Indicates chlorodiphenyl ether interference present at the retention time of the target compound.
P	Pesticide/Aroclor target analyte > 40% difference for detected concentrations between GC columns
Q	Indicates as estimated value because the P and P + 2 theoretical abundance ratio does not meet method criteria.
R	Duplicate Precision not met.
R1	Duplicate precision not within the specified limits; however, the results are below the MRL and considered estimated.
S	Surrogate recovery not within specified limits.

Data Qualifiers

Lab Standard

S	The reported value was determined by the Method of Standard Additions (MSA).
T	Analyte is a tentatively identified compound, result is estimated.
U	Compound was analyzed for, but was not detected (ND).
V1	The continuing calibration verification standard was outside (biased high) the specified limits for this compound.
V2	The continuing calibration verification standard was outside (biased low) the specified limits for this compound.
W	Result quantified, but the corresponding peak was detected outside the generated retention time window.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
X	See case narrative.
Y	Recovery outside limits
Y	The chromatogram resembles a petroleum product but does not match the calibration standard.
Z	The chromatogram does not resemble a petroleum product.
i	The MRL/MDL has been elevated due to a matrix interference.

ALS Laboratory Group

Acronyms

Cal	Calibration
Conc	CONCentration
Dioxin(s)	Polychlorinated dibenzo-p-dioxin(s)
EDL	Estimated Detection Limit
EMPC	Estimated Maximum Possible Concentration
Flags	Data qualifiers
Furan(s)	Polychlorinated dibenzofuran(s)
g	Grams
ICAL	Initial CALibration
ID	IDentifier
Ions	Masses monitored for the analyte during data acquisition
L	Liter (s)
LCS	Laboratory Control Sample
DLCS	Duplicate Laboratory Control Sample
MB	Method Blank
MCL	Method Calibration Limit
MDL	Method Detection Limit
mL	Milliliters
MS	Matrix Spiked sample
DMS	Duplicate Matrix Spiked sample
NO	Number of peaks meeting all identification criteria
PCDD(s)	Polychlorinated dibenzo-p-dioxin(s)
PCDF(s)	Polychlorinated dibenzofuran(s)
ppb	Parts per billion
ppm	Parts per million
ppq	Parts per quadrillion
ppt	Parts per trillion
QA	Quality Assurance
QC	Quality Control
Ratio	Ratio of areas from monitored ions for an analyte
% Rec.	Percent recovery
RPD	Relative Percent Difference
RRF	Relative Response Factor
RT	Retention Time
SDG	Sample Delivery Group
S/N	Signal-to-noise ratio
TEF	Toxicity Equivalence Factor
TEQ	Toxicity Equivalence Quotient

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ALS Environmental

State Certifications, Accreditations, and Licenses

Agency	Number	Expire Date
Arizona Department of Health Services	AZ0793	5/27/2020
Arkansas Department of Environmental Quality	19-028-0	3/27/2020
California Department of Health Services	2919	4/30/2020
Department of Defense	A2LA 2897.01	11/30/2021
Florida Department of Health	E87611	6/30/2020
Hawaii Department of Health	TX02694	4/30/2020
Illinois Environmental Protection Agency	2000322019-2	5/9/2020
Kansas Department of Health and Environment	E-10352	7/31/2020
Louisiana Department of Environmental Quality	03087	6/30/2020
Louisiana Department of Health and Hospitals	LA028-2020	12/31/2020
Maine Center for Disease Control and Prevention	201815	6/5/2020
Maryland Department of the Environment	343	6/30/2020
Minnesota Department of Health	1785988	12/31/2020
Nebraska Department of Health and Human Services	NE-OS-25-13	4/30/2020
Nevada Department of Concervation and Natural Resources	TX026932019-1	7/31/2020
New Hampshire Environmental Laboratory Accreditation Program	209419	4/24/2020
New Jersey Department of Environmental Protection	NLC190001	6/30/2020
New York Department of Health	11707	3/31/2020
Oklahoma Department of Environmental Quality	2019-067	8/31/2020
Pennsylvania Department of Environmental Protection	68-03441-013	6/30/2020
Tennessee Department of Environment and Concervation	04016	6/30/2020
Texas Commision on Environmental Quality	TX104704231-19-25	4/30/2020
United States Department of Agriculture	P330-19-00299	10/10/2022
Utah Department of Health Environmental Laboratory Certification	TX026932019-9	7/31/2020
Washington Department of Health	C819	11/14/2020
West Virginia Department of Environmental Protection	347	6/30/2020

Chain of Custody

ALS Environmental - Houston HRMS
10450 Stancliff Rd, Suite 210, Houston TX 77099
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E2000074
ALS Laboratory Group
HS20011091
5

10450 Stancliff Rd, Ste 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID:** **13193**

SUBCONTRACT TO:

ALS Environmental
10450 Stancliff RoadSuite 210
Houston, TX 77084

Phone: +1 281 530 5656

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:	HS20011091
TSR:	Danielle Winnings

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS20011091-02**	**LH18/24-SP650_012320_BIX**	**Water**	**23 Jan 2020 14:00**
	SUB_Perch-6850			03 Feb 2020

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. Modashia Date/Time: 01/27/2020 13:00

Received By: [illegible] Date/Time: 1/27/20 1300

Cooler ID(s): Temperature(s):

00968919

ALS Environmental

Cooler Receipt Form

Project Chemist CH

Client/Project ALS-H

Thermometer ID SMO4

Date/Time Received: 1/27/20 Initials: CH Date/Time Logged in: 1/27/20 Initials CH

1. Method of delivery: ○ US Mail ○ Fed Ex ○ UPS ○ DHL ✓ Courier ○ Client

2. Samples received in: ✓ Cooler ○ Box ○ Envelope ○ Other

3. Were custody seals on coolers? ○ Yes ✓ No If yes, how many and where?
Were they intact? ○ Yes ○ No ✓ N/A
Were they signed and dated? ○ Yes ○ No ✓ N/A

4. Packing Material: ○ Inserts ○ Baggies ○ Bubble Wrap ○ Gel Packs ✓ Wet Ice ○ Sleeves ○ Other

5. Foreign or Regulated Soil? ○ Yes ○ No Location of Sampling:

Cooler Tracking Number	COC ID	Date Opened	Time Opened	Opened By	Temp. °C	Temp Blank?
—		1/27/20	1300	CH	3.3(2)	☒
						☐
						☐
						☐

6. Were custody papers properly filled out (ink, signed, dated, etc)? ✓ Yes ○ No
7. Did all bottles arrive in good condition (not broken, no signs of leakage)? ✓ Yes ○ No
8. Were all sample labels complete (i.e., sample ID, analysis, preservation, etc)? ✓ Yes ○ No
9. Were appropriate bottles/containers and volumes received for the requested tests? ✓ Yes ○ No
10. Did sample labels and tags agree with custody documents? ✓ Yes ○ No

Notes, Discrepancies, & Resolutions:

Service request Label: E2000074 5
ALS Laboratory Group
HS20011091

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Houston, TX 77099
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F: +1 713 266 1599
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SAMPLE ACCEPTANCE POLICY

This policy outlines the criteria samples must meet to be accepted by ALS Environmental – Houston HRMS.

Cooler Custody Seals (desirable, mandatory if specified in SAP):

- ✓ Intact on outside of cooler, signed and dated

Chain-of-Custody (COC) documentation (mandatory):

The following is required on each COC:

- ✓ Sample ID, the location, date and time of collection, collector's name, preservation type, sample type, and any other special remarks concerning the sampleThe COC must be completed in ink.
- ✓ Signature and date of relinquishing party.

In the absence of a COC at sample receipt, the COC will be requested from the client.

Sample Integrity (mandatory):

Samples are inspected upon arrival to ensure that sample integrity was not compromised during transfer to the laboratory.

- ✓ Sample containers must arrive in good condition (not broken or leaking).
- ✓ Samples must be labeled appropriately, including Sample IDs, and requested test using durable labels and indelible ink.
- ✓ The correct type of sample bottle must be used for the method requested.
- ✓ An appropriate sample volume, or weight, must be received.
- ✓ Sample IDs and number of containers must reconcile with the COC.
- ✓ Samples must be received within the method defined holding time.

Temperature Requirement (varies by sample matrix):

- ✓ Aqueous and Non-aqueous samples must be shipped and stored cold, at 0 to 6ºC.
- ✓ Tissue samples must be shipped and stored frozen, at -20 to -10ºC.
- ✓ Air samples are shipped and stored cold, at 0 to 6ºC
- ✓ The sample temperature must be recorded on the COC

All cooler inspections are documented on the Cooler Receipt Form (CRF). A separate CRF is completed for each service request. Any samples not meeting the above criteria are noted on the CRF and the Project Manager notified. The Project Manager must resolve any sample integrity issues with the client prior to proceeding with the analysis. Such resolutions are documented in writing and filed with the project folder. Data associated with samples received outside of this acceptance policy will be qualified on the case narrative of the final report

Preparation Information Benchsheets

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Preparation Information Benchsheet

Prep Run#: 353630 **Prep WorkFlow:** GenExt28Day **Status:** Prepped
Team: Semivoa GCMS/KBROWN **Prep Method:** Method **Prep Date/Time:** 2/11/20 13:46

#	Lab Code	Client ID	B#	Method /Test	pH	Cl	Matrix	Amt. Ext.	Sample Description
1	E2000074-001	LH18/24-SP650_12320_BIX	.01	6850/ClO4 DOD			Water	10mL	
2	E2000075-001	HBW7_012020	.01	6850/ClO4 DOD			Surface Water	10mL	
3	E2000075-002	HBW10_012020	.01	6850/ClO4 DOD			Surface Water	10mL	
4	E2000075-003	HBW1_012020	.01	6850/ClO4 DOD			Surface Water	10mL	
5	E2000075-004	GPW1_012020	.01	6850/ClO4 DOD			Surface Water	10mL	
6	E2000075-005	GPW1_012020_a	.01	6850/ClO4 DOD			Surface Water	10mL	
7	E2000075-006	GPW3_012020	.01	6850/ClO4 DOD			Surface Water	10mL	
8	E2000076-001	LH18/24-SP650_12820_BIX	.01	6850/ClO4 DOD			Water	10mL	
9	E2000087-001	GW-MW-85-20200129-01	.01	6850/ClO4			Water	10mL	
10	E2000087-002	GW-MW-84-20200129-01	.01	6850/ClO4			Water	10mL	
11	E2000087-003	EB-001-20200129-01	.01	6850/ClO4			Water	10mL	
12	E2000092-001	LH18/24-SP650_020420_BIX	.01	6850/ClO4 DOD			Water	10mL	
13	EQ2000051-01	MB		6850/ClO4 DOD			Liquid	10mL	
14	EQ2000051-02	LCS		6850/ClO4 DOD			Liquid	10mL	
15	EQ2000051-03	DLCS		6850/ClO4 DOD			Liquid	10mL	

Spiking Solutions

Name: Sodium Perchlorate 1 ug/mL (IS) (18-O) as CLO4 Inventory ID 202037 Logbook Ref: Sodium Perchlorate Expires On: 05/22/2021

E2000074-001	100.00µL	E2000075-001	100.00µL	E2000075-002	100.00µL	E2000075-003	100.00µL	E2000075-004	100.00µL	E2000075-005	100.00µL
E2000075-006	100.00µL	E2000076-001	100.00µL	E2000087-001	100.00µL	E2000087-002	100.00µL	E2000087-003	100.00µL	E2000092-001	100.00µL
EQ2000051-01	100.00µL	EQ2000051-01	100.00µL	EQ2000051-02	0.10µL	EQ2000051-02	0.10µL	EQ2000051-03	0.10µL	EQ2000051-03	0.10µL

Name: Perchlorate Intermediate Stock1 Inventory ID 204799 Logbook Ref: 200657 1.0ug/mL KN Expires On: 05/15/2020

EQ2000051-02	10.00µL	EQ2000051-02	10.00µL	EQ2000051-03	10.00µL	EQ2000051-03	10.00µL

Preparation Steps

Step: Preparation
Started: 2/11/20 13:46
Finished: 2/11/20 15:00
By: KBROWN
Comments

Comments:

Preparation Information Benchsheet

Prep Run#: 353630
Team: Semivoa GCMS/KBROWN

Prep WorkFlow: GenExt28Day
Prep Method: Method

Status: Prepped
Prep Date/Time: 2/11/20 13:46

Reviewed By: KB Date: 02/12/2020

Chain of Custody

Relinquished By: _____ Date: _____

Received By: _____ Date: _____

Extracts Examined
Yes No

Analytical Results

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ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2000074
Project:	HS20011091	**Date Collected:**	1/23/20 1400
Sample Matrix:	Water	**Date Received:**	1/27/20
Sample Name:	LH18/24-SP650_12320_BIX	**Units:**	µg/L
Lab Code:	E2000074-001	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.136**		0.100	0.0500	0.0250	1	2/11/20	2/17/20 12:05	353630	670318	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2000074
Project:	HS20011091	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	µg/L
Lab Code:	EQ2000051-01	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0500	0.0250	1	2/11/20	2/17/20 11:42	353630	670318	

Accuracy & Precision

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ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: HS20011091
Sample Matrix: Water

Service Request: E2000074
Date Analyzed: 2/17/20

Lab Control Sample Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Units: µg/L
Basis: NA

Extraction Lot: 353630

	Lab Control Sample EQ2000051-02			Duplicate Lab Control Sample EQ2000051-03					
Analyte Name	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Perchlorate	0.855	1.00	86	0.842	1.00	84	84 - 119	2	15

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

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

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2000074
Project:	HS20011091	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Lab Control Sample	**Units:**	µg/L
Lab Code:	EQ2000051-02	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.855**		0.100	0.0500	0.0250	1	2/11/20	2/17/20 14:15	353630	670318	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2000074
Project:	HS20011091	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Duplicate Lab Control Sample	**Units:**	µg/L
Lab Code:	EQ2000051-03	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.842**		0.100	0.0500	0.0250	1	2/11/20	2/17/20 16:15	353630	670318	

Initial Calibration

ALS Environmental - Houston HRMS
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20191230

ICAL Date: 12/30/2019
Cal. Std. xp: 5/14/2020
ICAL ID: **EC2000001**

1st Review: Kneir
2nd Review: Hvan

ALS Environmental
LCMS01 -Shimadzu 8050

Mobile Phases **A:** 0.75% Formic Acid/Water 3100803-09 **B:** MeOH 3100802-01

	Sample Name		File Name	Acquisition Method	Dilution	R	Comments	Date/Time
	null	null	20191230_001	Perchlorate6850b.lcm	1x	☒		12/30/2019 10:02
	null	null	20191230_002	Perchlorate6850b.lcm	1x	☒		12/30/2019 10:07
	DIBLK	DIBLK	20191230_003	Perchlorate6850b.lcm	1x	☒		12/30/2019 10:12
	DIBLK	DIBLK	20191230_004	Perchlorate6850b.lcm	1x	☒		12/30/2019 10:20
	IB	IB	20191230_005	Perchlorate6850b.lcm	1x	☒		12/30/2019 10:28
	PERCHLORATE7	PERCHLORATE7	20191230_006	Perchlorate6850b.lcm	1x	☒	3100805-02	12/30/2019 10:48
	PERCHLORATE1	PERCHLORATE1	20191230_007	Perchlorate6850b.lcm	1x	☒	3100804-05	12/30/2019 10:56
	PERCHLORATE2	PERCHLORATE2	20191230_008	Perchlorate6850b.lcm	1x	☒	3100804-06	12/30/2019 11:04
	PERCHLORATE3	PERCHLORATE3	20191230_009	Perchlorate6850b.lcm	1x	☒	3100804-07	12/30/2019 11:12
	PERCHLORATE4	PERCHLORATE4	20191230_010	Perchlorate6850b.lcm	1x	☒	3100804-08	12/30/2019 11:19
	PERCHLORATE5	PERCHLORATE5	20191230_011	Perchlorate6850b.lcm	1x	☒	3100804-09	12/30/2019 11:27
	PERCHLORATE6	PERCHLORATE6	20191230_012	Perchlorate6850b.lcm	1x	☒	3100805-01	12/30/2019 11:35
	PERCHLORATE8	PERCHLORATE8	20191230_013	Perchlorate6850b.lcm	1x	☒	3100805-03	12/30/2019 11:43
	PERCHLORATE9	PERCHLORATE9	20191230_014	Perchlorate6850b.lcm	1x	☒	3100805-04	12/30/2019 11:51
	PERCHLORATE10	PERCHLORATE10	20191230_015	Perchlorate6850b.lcm	1x	☒	3100805-05	12/30/2019 11:59
	ICV	ICV	20191230_016	Perchlorate6850b.lcm	1x	☒	3100805-06	12/30/2019 12:07
	EQ1900442-01	EQ1900442-01	20191230_017	Perchlorate6850b.lcm	1x	☒		12/30/2019 14:01
	EQ1900442-02	EQ1900442-02	20191230_018	Perchlorate6850b.lcm	1x	☒		12/30/2019 14:09
	EQ1900442-03	EQ1900442-03	20191230_019	Perchlorate6850b.lcm	1x	☒		12/30/2019 14:17
	EQ1900442-04	EQ1900442-04	20191230_020	Perchlorate6850b.lcm	1x	☒		12/30/2019 14:25
	EQ1900442-05	EQ1900442-05	20191230_021	Perchlorate6850b.lcm	1x	☒		12/30/2019 14:33
	E1900912-001	E1900912-001	20191230_022	Perchlorate6850b.lcm	1x	☒		12/30/2019 14:41
	E1900912-002	E1900912-002	20191230_023	Perchlorate6850b.lcm	1x	☒		12/30/2019 14:49
	CCV	CCV	20191230_024	Perchlorate6850b.lcm	1x	☒	3100805-02	12/30/2019 14:57
	E1900912-001X1000	E1900912-001X1000	20191230_025	Perchlorate6850b.lcm	1000	☒		12/30/2019 17:06
	E1900912-002X100	E1900912-002X100	20191230_026	Perchlorate6850b.lcm	100	☒		12/30/2019 17:14
	CCV	CCV	20191230_027	Perchlorate6850b.lcm	1x	☒	3100805-02	12/30/2019 17:22

Initial Calibration - Detailed Report

Calibration ID: EC2000001 **Instrument ID:** E-LCMS-01
Column Name: 1

#	Lab Code	Sample Name	File Location	Aquisition Date
07	EC2000001-07	PERCHLORATE7	20191230_006	12/30/2019 10:48
01	EC2000001-01	PERCHLORATE1	20191230_007	12/30/2019 10:56
02	EC2000001-02	PERCHLORATE2	20191230_008	12/30/2019 11:04
03	EC2000001-03	PERCHLORATE3	20191230_009	12/30/2019 11:12
04	EC2000001-04	PERCHLORATE4	20191230_010	12/30/2019 11:19
05	EC2000001-05	PERCHLORATE5	20191230_011	12/30/2019 11:27
06	EC2000001-06	PERCHLORATE6	20191230_012	12/30/2019 11:35
08	EC2000001-08	PERCHLORATE8	20191230_013	12/30/2019 11:43
09	EC2000001-09	PERCHLORATE9	20191230_014	12/30/2019 11:51
10	EC2000001-10	PERCHLORATE10	20191230_015	12/30/2019 11:59

Analyte **Curve Fit** **Weighting**

Perchlorate **Average RF** **RSD = 10.79** **Average RF = 0.1352**

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.1000	0.1736	02	0.5000	0.1222	03	0.7000	0.1219	04	1.0000	0.1363
05	2.0000	0.1337	06	5.0000	0.1268	07	10.0000	0.1373	08	20.0000	0.1349
09	30.0000	0.133	10	50.0000	0.1325						

Analyte

Perchlorate

#	Amount	Calculated Conc	%D	#	Amount	Calculated Conc	%D	#	Amount	Calculated Conc	%D
01	0.1000	0.128	28.4	02	0.5000	0.452	-9.6	03	0.7000	0.631	-9.9
04	1.0000	1.01	0.8	05	2.0000	1.98	-1.1	06	5.0000	4.69	-6.2
07	10.0000	10.2	1.6	08	20.0000	20.0	-0.2	09	30.0000	29.5	-1.6
10	50.0000	49.0	-2.0								

Initial Calibration Verification Summary Report

Calibration ID:	EC2000001	**Instrument ID:**	E-LCMS-01
Datafile ID:	20191230_016	**Column Name:**	1

Analyte	Lab Code	Type	Curve Fit	True Value	Calc Conc	Units	Result	Criteria
Perchlorate	EC2000001-11	T	Average RF	10	12.276	ng/mL	22.7	<= 25

ALS Group Houston

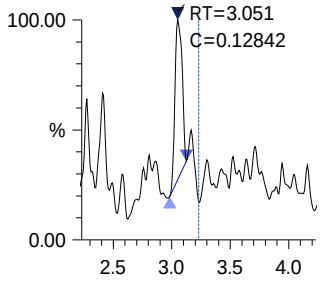
PERCHLORATE1

Date acquired: 12/30/2019 10:56:14 AM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20191230\20191230_007.lcd
Vial: 3 | Inj. Volume: 25.0000uL | Tray: 1

Name	Data Filename	Sample ID	Found RT	Area	Conc.	Acquired Date	Cal Point	Dil. Factor	Inj Vol	ISTD Area	Tray	Vial
Perchlorate	20191230_007	PERCHLORATE1	3.051	4022	0.12842	12/30/2019 10:56:14 AM	Yes	1.00000	25.0000	231680	1	3
Sodium Perchlorate-18O4_IS	20191230_007	PERCHLORATE1	3.051	231680	1.00000	12/30/2019 10:56:14 AM	No	1.00000	25.0000	231680	1	3

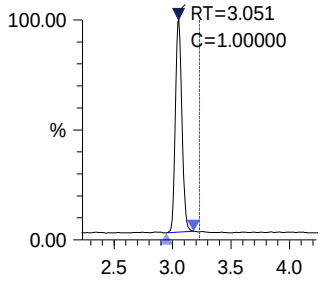
Perchlorate

Conc 0.12842
Area 4022
Q 99.00>83.00 (-) 1.27e3



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 231680
ISTD 107.00>89.00 (-) 5.94e4



ALS Group Houston

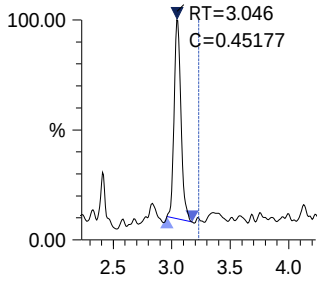
PERCHLORATE2

Date acquired: 12/30/2019 11:04:09 AM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20191230\20191230_008.lcd
Vial: 4 | Inj. Volume: 25.0000uL | Tray: 1

Name	Data Filename	Sample ID	Found RT	Area	Conc.	Acquired Date	Cal Point	Dil. Factor	Inj Vol	ISTD Area	Tray	Vial
Perchlorate	20191230_008	PERCHLORATE2	3.046	15985	0.45177	12/30/2019 11:04:09 AM	Yes	1.00000	25.0000	261704	1	4
Sodium Perchlorate-18O4_IS	20191230_008	PERCHLORATE2	3.045	261704	1.00000	12/30/2019 11:04:09 AM	No	1.00000	25.0000	261704	1	4

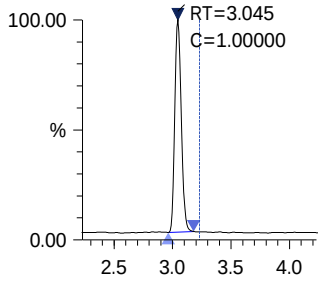
Perchlorate

Conc 0.45177
Area 15985
Q 99.00>83.00 (-) 4.21e3



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 261704
ISTD 107.00>89.00 (-) 6.75e4



ALS Group Houston

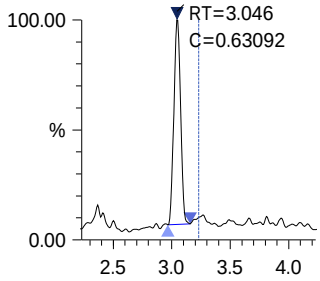
PERCHLORATE3

Date acquired: 12/30/2019 11:12:06 AM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20191230\20191230_009.lcd
Vial: 5 | Inj. Volume: 25.0000uL | Tray: 1

Name	Data Filename	Sample ID	Found RT	Area	Conc.	Acquired Date	Cal Point	Dil. Factor	Inj Vol	ISTD Area	Tray	Vial
Perchlorate	20191230_009	PERCHLORATE3	3.046	22031	0.63092	12/30/2019 11:12:06 AM	Yes	1.00000	25.0000	258274	1	5
Sodium Perchlorate-18O4_IS	20191230_009	PERCHLORATE3	3.044	258274	1.00000	12/30/2019 11:12:06 AM	No	1.00000	25.0000	258274	1	5

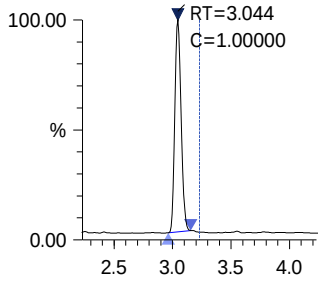
Perchlorate

Conc 0.63092
Area 22031
Q 99.00>83.00 (-) 5.75e3



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 258274
ISTD 107.00>89.00 (-) 6.88e4



ALS Group Houston

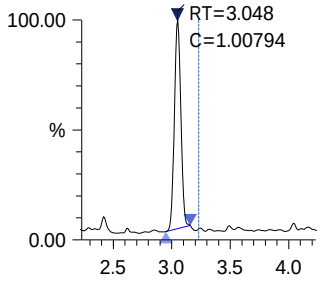
PERCHLORATE4

Date acquired: 12/30/2019 11:19:58 AM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20191230\20191230_010.lcd
Vial: 6 | Inj. Volume: 25.0000uL | Tray: 1

Name	Data Filename	Sample ID	Found RT	Area	Conc.	Acquired Date	Cal Point	Dil. Factor	Inj Vol	ISTD Area	Tray	Vial
Perchlorate	20191230_010	PERCHLORATE4	3.048	36488	1.00794	12/30/2019 11:19:58 AM	Yes	1.00000	25.0000	267754	1	6
Sodium Perchlorate-18O4_IS	20191230_010	PERCHLORATE4	3.046	267754	1.00000	12/30/2019 11:19:58 AM	No	1.00000	25.0000	267754	1	6

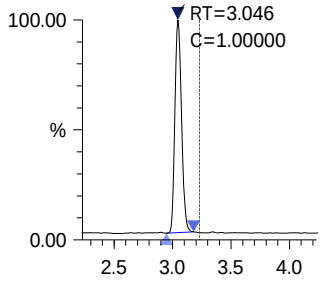
Perchlorate

Conc 1.00794
Area 36488
Q 99.00>83.00 (-) 9.73e3



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 267754
ISTD 107.00>89.00 (-) 6.78e4



ALS Group Houston

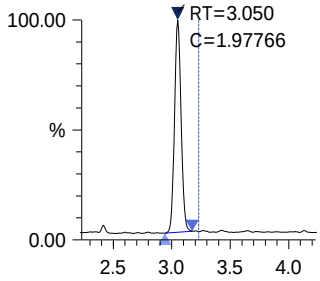
PERCHLORATE5

Date acquired: 12/30/2019 11:27:53 AM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20191230\20191230_011.lcd
Vial: 7 | Inj. Volume: 25.0000uL | Tray: 1

Name	Data Filename	Sample ID	Found RT	Area	Conc.	Acquired Date	Cal Point	Dil. Factor	Inj Vol	ISTD Area	Tray	Vial
Perchlorate	20191230_011	PERCHLORATE5	3.050	74631	1.97766	12/30/2019 11:27:53 AM	Yes	1.00000	25.0000	279118	1	7
Sodium Perchlorate-18O4_IS	20191230_011	PERCHLORATE5	3.046	279118	1.00000	12/30/2019 11:27:53 AM	No	1.00000	25.0000	279118	1	7

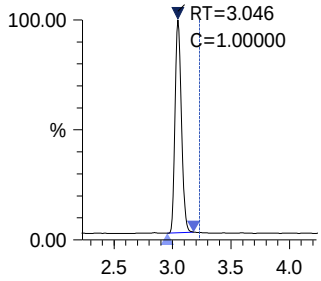
Perchlorate

Conc 1.97766
Area 74631
Q 99.00>83.00 (-) 1.92e4



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 279118
ISTD 107.00>89.00 (-) 7.33e4



PERCHLORATE6

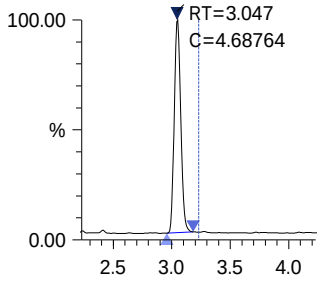
Date acquired: 12/30/2019 11:35:50 AM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20191230\20191230_012.lcd
Vial: 8 | Inj. Volume: 25.0000uL | Tray: 1

Name	Data Filename	Sample ID	Found RT	Area	Conc.	Acquired Date	Cal Point	Dil. Factor	Inj Vol	ISTD Area	Tray	Vial
Perchlorate	20191230_012	PERCHLORATE6	3.047	159122	4.68764	12/30/2019 11:35:50 AM	Yes	1.00000	25.0000	251072	1	8
Sodium Perchlorate-18O4_IS	20191230_012	PERCHLORATE6	3.045	251072	1.00000	12/30/2019 11:35:50 AM	No	1.00000	25.0000	251072	1	8

Perchlorate

Conc 4.68764
Area 159122

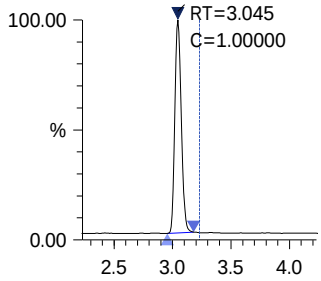
Q 99.00>83.00 (-) 4.12e4



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 251072

ISTD 107.00>89.00 (-) 6.53e4



ALS Group Houston

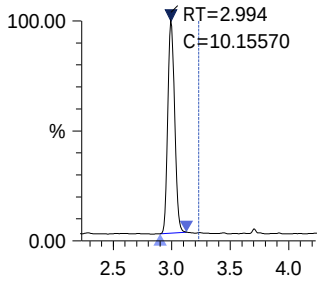
PERCHLORATE7

Date acquired: 12/30/2019 10:48:20 AM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20191230\20191230_006.lcd
Vial: 9 | Inj. Volume: 25.0000uL | Tray: 1

Name	Data Filename	Sample ID	Found RT	Area	Conc.	Acquired Date	Cal Point	Dil. Factor	Inj Vol	ISTD Area	Tray	Vial
Perchlorate	20191230_006	PERCHLORATE7	2.994	298821	10.15570	12/30/2019 10:48:20 AM	Yes	1.00000	25.0000	217632	1	9
Sodium Perchlorate-18O4_IS	20191230_006	PERCHLORATE7	2.991	217632	1.00000	12/30/2019 10:48:20 AM	No	1.00000	25.0000	217632	1	9

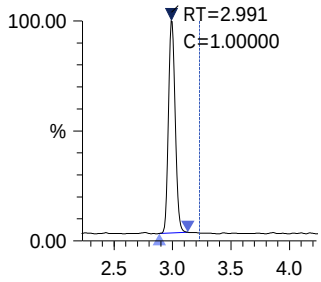
Perchlorate

Conc 10.15570
Area 298821
Q 99.00>83.00 (-) 7.46e4



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 217632
ISTD 107.00>89.00 (-) 5.38e4



ALS Group Houston

PERCHLORATE8

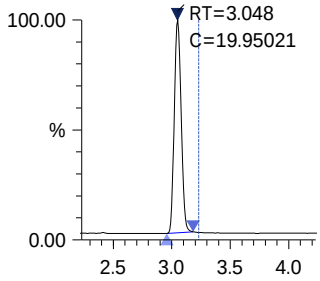
Date acquired: 12/30/2019 11:43:47 AM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20191230\20191230_013.lcd
Vial: 10 | Inj. Volume: 25.0000uL | Tray: 1

Name	Data Filename	Sample ID	Found RT	Area	Conc.	Acquired Date	Cal Point	Dil. Factor	Inj Vol	ISTD Area	Tray	Vial
Perchlorate	20191230_013	PERCHLORATE8	3.048	557358	19.95021	12/30/2019 11:43:47 AM	Yes	1.00000	25.0000	206636	1	10
Sodium Perchlorate-18O4_IS	20191230_013	PERCHLORATE8	3.045	206636	1.00000	12/30/2019 11:43:47 AM	No	1.00000	25.0000	206636	1	10

Perchlorate

Conc 19.95021
Area 557358

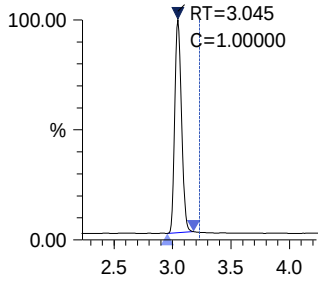
Q 99.00>83.00 (-) 1.37e5



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 206636

ISTD 107.00>89.00 (-) 5.11e4



ALS Group Houston

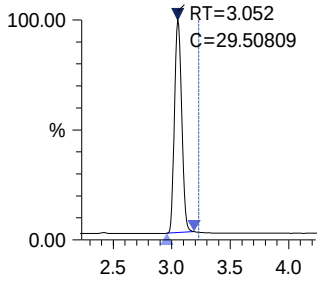
PERCHLORATE9

Date acquired: 12/30/2019 11:51:43 AM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20191230\20191230_014.lcd
Vial: 11 | Inj. Volume: 25.0000uL | Tray: 1

Name	Data Filename	Sample ID	Found RT	Area	Conc.	Acquired Date	Cal Point	Dil. Factor	Inj Vol	ISTD Area	Tray	Vial
Perchlorate	20191230_014	PERCHLORATE9	3.052	730647	29.50809	12/30/2019 11:51:43 AM	Yes	1.00000	25.0000	183142	1	11
Sodium Perchlorate-18O4_IS	20191230_014	PERCHLORATE9	3.049	183142	1.00000	12/30/2019 11:51:43 AM	No	1.00000	25.0000	183142	1	11

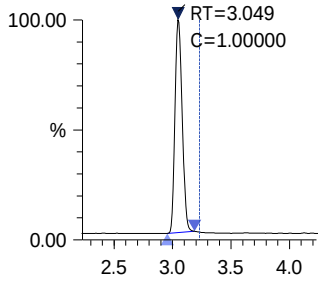
Perchlorate

Conc 29.50809
Area 730647
Q 99.00>83.00 (-) 1.70e5



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 183142
ISTD 107.00>89.00 (-) 4.27e4



ALS Group Houston

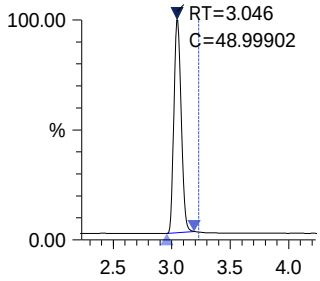
PERCHLORATE10

Date acquired: 12/30/2019 11:59:38 AM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20191230\20191230_015.lcd
Vial: 12 | Inj. Volume: 25.0000uL | Tray: 1

Name	Data Filename	Sample ID	Found RT	Area	Conc.	Acquired Date	Cal Point	Dil. Factor	Inj Vol	ISTD Area	Tray	Vial
Perchlorate	20191230_015	PERCHLORATE10	3.046	1090166	48.99902	12/30/2019 11:59:38 AM	Yes	1.00000	25.0000	164560	1	12
Sodium Perchlorate-18O4_IS	20191230_015	PERCHLORATE10	3.043	164560	1.00000	12/30/2019 11:59:38 AM	No	1.00000	25.0000	164560	1	12

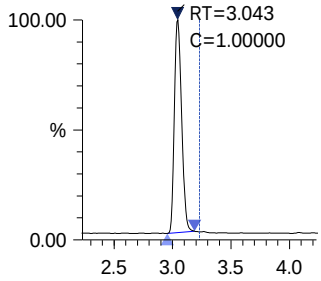
Perchlorate

Conc 48.99902
Area 1090166
Q 99.00>83.00 (-) 2.51e5



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 164560
ISTD 107.00>89.00 (-) 3.80e4



ALS Group Houston

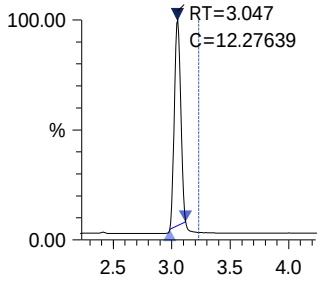
ICV

Date acquired: 12/30/2019 12:07:32 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20191230\20191230_016.lcd
Vial: 13 | Inj. Volume: 25.0000uL | Tray: 1

Name	Data Filename	Sample ID	Found RT	Area	Conc.	Acquired Date	Cal Point	Dil. Factor	Inj Vol	ISTD Area	Tray	Vial
Perchlorate	20191230_016	ICV	3.047	347932	12.27639	12/30/2019 12:07:32 PM	No	1.00000	25.0000	209626	1	13
Sodium Perchlorate-18O4_IS	20191230_016	ICV	3.045	209626	1.00000	12/30/2019 12:07:32 PM	No	1.00000	25.0000	209626	1	13

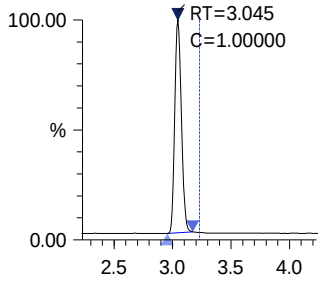
Perchlorate

Conc 12.27639
Area 347932
Q 99.00>83.00 (-) 9.49e4



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 209626
ISTD 107.00>89.00 (-) 5.28e4



Chromatograms and Selected Ion Monitoring

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 320, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

20200217

1st Review: Kneir
2nd Review: Hvan

ALS Environmental
LCMS01 -Shimadzu 8050

ICAL Date: 12/30/2019
Cal. Std. xp: 5/14/2020
ICAL ID: **EC2000001**

Mobile Phases **A:** 0.75% Formic Acid/Water 3100803-09 **B:** MeOH 3100802-01

	Sample Name		File Name	Acquisition Method	Dilution	R	Comments	Date/Time
	NULL		20200217_001	Perchlorate6850b.lcm	1x	☒		2/17/2020 10:47
	NULL		20200217_002	Perchlorate6850b.lcm	1x	☒		2/17/2020 10:52
	NULL		20200217_003	Perchlorate6850b.lcm	1x	☒		2/17/2020 10:57
	DIBLK		20200217_004	Perchlorate6850b.lcm	1x	☒		2/17/2020 11:02
	DIBLK		20200217_005	Perchlorate6850b.lcm	1x	☒		2/17/2020 11:10
	IB		20200217_006	Perchlorate6850b.lcm	1x	☒		2/17/2020 11:18
	PERCHLORATE7		20200217_007	Perchlorate6850b.lcm	1x	☒	3100805-02	2/17/2020 11:26
	LODV-0.5		20200217_008	Perchlorate6850b.lcm	1x	☒		2/17/2020 11:34
	EQ2000051-01		20200217_009	Perchlorate6850b.lcm	1x	☒		2/17/2020 11:42
	EQ2000051-02		20200217_010	Perchlorate6850b.lcm	1x	☒		2/17/2020 11:50
	EQ2000051-03RI		20200217_011	Perchlorate6850b.lcm	1x	☒	high IS-RR	2/17/2020 11:57
	E2000074-001		20200217_012	Perchlorate6850b.lcm	1x	☒		2/17/2020 12:05
	E2000075-001		20200217_013	Perchlorate6850b.lcm	1x	☒		2/17/2020 12:13
	E2000075-002		20200217_014	Perchlorate6850b.lcm	1x	☒		2/17/2020 12:21
	PERCHLORATE7		20200217_015	Perchlorate6850b.lcm	1x	☒	3100805-02	2/17/2020 12:29
	E2000075-003		20200217_016	Perchlorate6850b.lcm	1x	☒		2/17/2020 12:37
	E2000075-004RI		20200217_017	Perchlorate6850b.lcm	1x		high IS-RR	2/17/2020 12:45
	E2000075-005RI		20200217_018	Perchlorate6850b.lcm	1x		high IS-RR	2/17/2020 12:53
	E2000075-006RI		20200217_019	Perchlorate6850b.lcm	1x		high IS-RR	2/17/2020 13:01
	E2000076-001RI		20200217_020	Perchlorate6850b.lcm	1x		high IS-RR	2/17/2020 13:09
	E2000087-001RI		20200217_021	Perchlorate6850b.lcm	1x		high IS-RR	2/17/2020 13:16
	E2000087-002		20200217_022	Perchlorate6850b.lcm	1x	☒		2/17/2020 13:24
	E2000087-003RI		20200217_023	Perchlorate6850b.lcm	1x		high IS-RR	2/17/2020 13:32
	E2000092-001RI		20200217_024	Perchlorate6850b.lcm	1x		high IS-RR	2/17/2020 13:40
	PERCHLORATE7		20200217_25	Perchlorate6850b.lcm	1x	☒	3100805-02	2/17/2020 13:48
	LODV		20200217_026	Perchlorate6850b.lcm	1x	☒		2/17/2020 14:15
	LODV		20200217_027	Perchlorate6850b.lcm	1x	☒		2/17/2020 14:22
	E2000075-004		20200217_028	Perchlorate6850b.lcm	1x	☒		2/17/2020 14:30
	E2000075-005		20200217_029	Perchlorate6850b.lcm	1x	☒		2/17/2020 14:38
	E2000075-006		20200217_030	Perchlorate6850b.lcm	1x	☒		2/17/2020 14:46
	E2000076-001		20200217_031	Perchlorate6850b.lcm	1x	☒		2/17/2020 14:54
	E2000087-001		20200217_032	Perchlorate6850b.lcm	1x	☒		2/17/2020 15:02
	E2000087-003		20200217_033	Perchlorate6850b.lcm	1x	☒		2/17/2020 15:10
	E2000092-001		20200217_034	Perchlorate6850b.lcm	1x	☒		2/17/2020 15:18
	EQ2000051-03		20200217_035	Perchlorate6850b.lcm	1x	☒		2/17/2020 16:15
	PERCHLORATE7		20200217_036	Perchlorate6850b.lcm	1x	☒	3100805-02	2/17/2020 16:23

Internal Standard Summary

QAP: LAB QAP
Spec No: 12474 Ver. 1

Test: 6850/ClO4

Instrument ID: E-LCMS-01
Date Acquired: 2/17/20 11:26

Analysis Lot: 670318

		Sodium Perchlorate-18O4	
		Area	**RT**
	ICAL Average ==>	230,109	3.04
	Upper Limit ==>	345,164	5.04
	Lower Limit ==>	115,055	1.04
Associated Analyses			
20200217_0(EQ2000058-01	Continuing Calibration Ve	252,380	3.16
20200217_0(EQ2000051-01	Method Blank	158,257	3.16
20200217_01 EQ2000051-02	Lab Control Sample	255,372	3.16

Internal Standard Summary

QAP: LAB QAP
Spec No: 12474 Ver. 1

Test: 6850/ClO4

Instrument ID: E-LCMS-01
Date Acquired: 2/17/20 12:29

Analysis Lot: 670318

		Sodium Perchlorate-18O4	
		Area	**RT**
	ICAL Average ==>	230,109	3.04
	Upper Limit ==>	345,164	5.04
	Lower Limit ==>	115,055	1.04
Associated Analyses			
20200217_01 EQ2000058-02	Continuing Calibration Ve	282,852	3.16
20200217_02 E2000087-002	GW-MW-84-20200129-01	322,272	3.15

Internal Standard Summary

QAP: LAB QAP
Spec No: 12474 Ver. 1

Test: 6850/ClO4

Instrument ID: E-LCMS-01
Date Acquired: 2/17/20 13:48

Analysis Lot: 670318

		Sodium Perchlorate-18O4	
		Area	**RT**
	ICAL Average ==>	230,109	3.04
	Upper Limit ==>	345,164	5.04
	Lower Limit ==>	115,055	1.04
Associated Analyses			
20200217_02 EQ2000058-03	Continuing Calibration Ve	266,026	3.16
20200217_03 E2000087-001	GW-MW-85-20200129-01	301,657	3.15
20200217_03 E2000087-003	EB-001-20200129-01	253,755	3.16
20200217_03 EQ2000051-03	Duplicate Lab Control San	287,501	3.11

Internal Standard Summary

QAP: LAB QAP
Spec No: 12474 Ver. 1

Test: 6850/ClO4

Instrument ID: E-LCMS-01
Date Acquired: 2/17/20 16:23

Analysis Lot: 670318

		Sodium Perchlorate-18O4	
		Area	**RT**
	ICAL Average ==>	230,109	3.04
	Upper Limit ==>	345,164	5.04
	Lower Limit ==>	115,055	1.04
Associated Analyses			
20200217_03 EQ2000058-04	Continuing Calibration Ve	293,622	3.16

Internal Standard Summary

QAP: LAB QAP
Spec No: 99479 Ver. 1

Test: 6850/ClO4 DOD

Instrument ID: E-LCMS-01
Date Acquired: 2/17/20 11:26

Analysis Lot: 670318

		Sodium Perchlorate-18O4	
		Area	**RT**
	ICAL Average ==>	230,109	3.04
	Upper Limit ==>	345,164	5.04
	Lower Limit ==>	115,055	1.04
Associated Analyses			
20200217_0(EQ2000058-01	Continuing Calibration Ve	252,380	3.16
20200217_0(EQ2000051-01	Method Blank	158,257	3.16
20200217_01 EQ2000051-02	Lab Control Sample	255,372	3.16
20200217_01 E2000074-001	LH18/24-SP650_12320_E	338,697	3.14
20200217_01 E2000075-001	HBW7_012020	298,684	3.15
20200217_01 E2000075-002	HBW10_012020	320,264	3.16

Internal Standard Summary

QAP: LAB QAP
Spec No: 99479 Ver. 1

Test: 6850/ClO4 DOD

Instrument ID: E-LCMS-01
Date Acquired: 2/17/20 12:29

Analysis Lot: 670318

		Sodium Perchlorate-18O4	
		Area	**RT**
	ICAL Average ==>	230,109	3.04
	Upper Limit ==>	345,164	5.04
	Lower Limit ==>	115,055	1.04
Associated Analyses			
20200217_01 EQ2000058-02	Continuing Calibration Ve	282,852	3.16
20200217_01 E2000075-003	HBW1_012020	293,434	3.15

Internal Standard Summary

QAP: LAB QAP
Spec No: 99479 Ver. 1

Test: 6850/ClO4 DOD

Instrument ID: E-LCMS-01
Date Acquired: 2/17/20 13:48

Analysis Lot: 670318

		Sodium Perchlorate-18O4	
		Area	**RT**
	ICAL Average ==>	230,109	3.04
	Upper Limit ==>	345,164	5.04
	Lower Limit ==>	115,055	1.04
Associated Analyses			
20200217_02 EQ2000058-03	Continuing Calibration Ve	266,026	3.16
20200217_02 E2000075-004	GPW1_012020	280,167	3.16
20200217_02 E2000075-005	GPW1_012020_a	291,838	3.16
20200217_03 E2000075-006	GPW3_012020	311,790	3.16
20200217_03 E2000076-001	LH18/24-SP650_12820_E	322,092	3.14
20200217_03 E2000092-001	LH18/24-SP650_020420_	295,380	3.14
20200217_03 EQ2000051-03	Duplicate Lab Control San	287,501	3.11

Internal Standard Summary

QAP: LAB QAP
Spec No: 99479 Ver. 1

Test: 6850/ClO4 DOD

Instrument ID: E-LCMS-01
Date Acquired: 2/17/20 16:23

Analysis Lot: 670318

		Sodium Perchlorate-18O4	
		Area	**RT**
	ICAL Average ==>	230,109	3.04
	Upper Limit ==>	345,164	5.04
	Lower Limit ==>	115,055	1.04
Associated Analyses			
20200217_03 EQ2000058-04	Continuing Calibration Ve	293,622	3.16

Quantitation Report

Data File:	I:\LCMS01\DATA\20200217\20200217_007	**Instrument:**	E-LCMS-01
Acqu Date:	2/17/20 11:26	**Vial:**	8
Run Type:	CCV	**Dilution:**	1
Lab ID:	EQ2000058-01	**Raw Units:**	ng/mL

Bottle ID:		**Tier:**	IV	**Matrix:**	Water
Prod Code:	ClO4 DOD	**Collect Date:**	1/23/20	**Receive Date:**	1/27/20

Analysis Lot:	670318	**Prep Lot:**		**Report Group:**	EQ2000058
Analysis Method:	6850	**Prep Method:**			
		Prep Date:			

Title:	Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass	**Calibration ID:**	EC2000001
		Report List ID:	21851

Internal Standard Compounds

Parameter Name	RT	RT Dev	Response	Solution Conc	Area Criteria
Sodium Perchlorate-18O4	3.158		252380	1.00000	OK

Target Compounds

Parameter Name	RT	RT Dev	Response	Solution Conc	Rpt?
Perchlorate	3.160		361516	10.59482	Y

U: Undetected at or above MDL
J: Analyte detected above MDL, but below MRL
B: Hit above MRL also found in Method Blank
E: Analyte concentration above high point of ICAL
N: Presumptive evidence of compound

D: Result from dilution
m: Manual integration performed
d: Compound manually deleted
NR: Analyte not reported from this analysis

*: Result fails acceptance criteria
#: Acceptance criteria not applicable
?: Insufficient information to determine acceptance
e: Result >= MRL, but MRL less than low point of ICAL
c: check for co-elution

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Continuing Calibration Verification Summary

Calibration ID: EC2000001 **Spec Set:** #99479 v. 1

QAP Name: LAB QAP **List ID:** #21851

List Name: Perchlorate RJ DOD **Signal ID:** 1

Data File: I:\LCMS01\DATA\20200217\20200217_007

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Perchlorate	10.0	10.6	0.1352	0.1432	6		± 15%	Average RF

Quantitation Report

Data File:	I:\LCMS01\DATA\20200217\20200217_015	**Instrument:**	E-LCMS-01
Acqu Date:	2/17/20 12:29	**Vial:**	6
Run Type:	CCV	**Dilution:**	1
Lab ID:	EQ2000058-02	**Raw Units:**	ng/mL

Bottle ID:		**Tier:**	IV	**Matrix:**	Water
Prod Code:	ClO4 DOD	**Collect Date:**	1/23/20	**Receive Date:**	1/27/20

Analysis Lot:	670318	**Prep Lot:**		**Report Group:**	EQ2000058
Analysis Method:	6850	**Prep Method:**			
		Prep Date:			

Title:	Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass	**Calibration ID:**	EC2000001
		Report List ID:	21851

Internal Standard Compounds

Parameter Name	RT	RT Dev	Response	Solution Conc	Area Criteria
Sodium Perchlorate-18O4	3.159		282852	1.00000	OK

Target Compounds

Parameter Name	RT	RT Dev	Response	Solution Conc	Rpt?
Perchlorate	3.161		407931	10.66715	Y

U: Undetected at or above MDL
J: Analyte detected above MDL, but below MRL
B: Hit above MRL also found in Method Blank
E: Analyte concentration above high point of ICAL
N: Presumptive evidence of compound

D: Result from dilution
m: Manual integration performed
d: Compound manually deleted
NR: Analyte not reported from this analysis

*: Result fails acceptance criteria
#: Acceptance criteria not applicable
?: Insufficient information to determine acceptance
e: Result >= MRL, but MRL less than low point of ICAL
c: check for co-elution

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Continuing Calibration Verification Summary

Calibration ID: EC2000001 **Spec Set:** #99479 v. 1

QAP Name: LAB QAP **List ID:** #21851

List Name: Perchlorate RJ DOD **Signal ID:** 1

Data File: I:\LCMS01\DATA\20200217\20200217_015

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Perchlorate	10.0	10.7	0.1352	0.1442	7		± 15%	Average RF

Quantitation Report

Data File:	I:\LCMS01\DATA\20200217\20200217_025	**Instrument:**	E-LCMS-01
Acqu Date:	2/17/20 13:48	**Vial:**	4
Run Type:	CCV	**Dilution:**	1
Lab ID:	EQ2000058-03	**Raw Units:**	ng/mL

Bottle ID:		**Tier:**	IV	**Matrix:**	Water
Prod Code:	ClO4 DOD	**Collect Date:**	1/23/20	**Receive Date:**	1/27/20

Analysis Lot:	670318	**Prep Lot:**		**Report Group:**	EQ2000058
Analysis Method:	6850	**Prep Method:**			
		Prep Date:			

Title:	Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass	**Calibration ID:**	EC2000001
		Report List ID:	21851

Internal Standard Compounds

Parameter Name	RT	RT Dev	Response	Solution Conc	Area Criteria
Sodium Perchlorate-18O4	3.158		266026	1.00000	OK

Target Compounds

Parameter Name	RT	RT Dev	Response	Solution Conc	Rpt?
Perchlorate	3.159		391076	10.87321	Y

U: Undetected at or above MDL
J: Analyte detected above MDL, but below MRL
B: Hit above MRL also found in Method Blank
E: Analyte concentration above high point of ICAL
N: Presumptive evidence of compound

D: Result from dilution
m: Manual integration performed
d: Compound manually deleted
NR: Analyte not reported from this analysis

*: Result fails acceptance criteria
#: Acceptance criteria not applicable
?: Insufficient information to determine acceptance
e: Result >= MRL, but MRL less than low point of ICAL
c: check for co-elution

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Continuing Calibration Verification Summary

Calibration ID: EC2000001
QAP Name: LAB QAP
List Name: Perchlorate RJ DOD
Data File: I:\LCMS01\DATA\20200217\20200217_025

Spec Set: #99479 v. 1
List ID: #21851
Signal ID: 1

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Perchlorate	10.0	10.9	0.1352	0.1470	9		± 15%	Average RF

Quantitation Report

Data File:	I:\LCMS01\DATA\20200217\20200217_036	**Instrument:**	E-LCMS-01
Acqu Date:	2/17/20 16:23	**Vial:**	2
Run Type:	CCV	**Dilution:**	1
Lab ID:	EQ2000058-04	**Raw Units:**	ng/mL

Bottle ID:		**Tier:**	IV	**Matrix:**	Water
Prod Code:	ClO4 DOD	**Collect Date:**	1/23/20	**Receive Date:**	1/27/20

Analysis Lot:	670318	**Prep Lot:**		**Report Group:**	EQ2000058
Analysis Method:	6850	**Prep Method:**			
		Prep Date:			

Title:	Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass	**Calibration ID:**	EC2000001
		Report List ID:	21851

Internal Standard Compounds

Parameter Name	RT	RT Dev	Response	Solution Conc	Area Criteria
Sodium Perchlorate-18O4	3.158		293622	1.00000	OK

Target Compounds

Parameter Name	RT	RT Dev	Response	Solution Conc	Rpt?
Perchlorate	3.159		417294	10.51172	Y

U: Undetected at or above MDL
J: Analyte detected above MDL, but below MRL
B: Hit above MRL also found in Method Blank
E: Analyte concentration above high point of ICAL
N: Presumptive evidence of compound

D: Result from dilution
m: Manual integration performed
d: Compound manually deleted
NR: Analyte not reported from this analysis

*: Result fails acceptance criteria
#: Acceptance criteria not applicable
?: Insufficient information to determine acceptance
e: Result >= MRL, but MRL less than low point of ICAL
c: check for co-elution

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Continuing Calibration Verification Summary

Calibration ID: EC2000001
Spec Set: #99479 v. 1
QAP Name: LAB QAP
List ID: #21851
List Name: Perchlorate RJ DOD
Signal ID: 1
Data File: I:\LCMS01\DATA\20200217\20200217_036

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Perchlorate	10.0	10.5	0.1352	0.1421	5		± 15%	Average RF

Quantitation Report

Data File:	I:\LCMS01\DATA\20200217\20200217_009	**Instrument:**	E-LCMS-01
Acqu Date:	2/17/20 11:42	**Vial:**	21
Run Type:	MB	**Dilution:**	1
Lab ID:	EQ2000051-01	**Raw Units:**	ng/mL

Bottle ID:		**Tier:**	II	**Matrix:**	Water
Prod Code:	ClO4 DOD	**Collect Date:**	1/23/20	**Receive Date:**	1/27/20

Analysis Lot:	670318	**Prep Lot:**	353630	**Report Group:**	EQ2000051
Analysis Method:	6850	**Prep Method:**	Method		
		Prep Date:	2/11/20		

Title:	Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass	**Calibration ID:**	EC2000001
		Report List ID:	21851

Internal Standard Compounds

Parameter Name	RT	RT Dev	Response	Solution Conc	Area Criteria
Sodium Perchlorate-18O4	3.158		158257	1.00000	OK

Target Compounds

Final Conc.Units: ug/L

Parameter Name	RT	RT Dev	Response	Solution Conc	Final Conc	Q	Rpt?
Perchlorate	0		0	0	0	U	Y

Prep Amount:	10 mL	**Dilution:**	1
Prep Final Amount:	10.00 mL	**Basis Factor:**	100.00

U: Undetected at or above MDL
J: Analyte detected above MDL, but below MRL
B: Hit above MRL also found in Method Blank
E: Analyte concentration above high point of ICAL
N: Presumptive evidence of compound

D: Result from dilution
m: Manual integration performed
d: Compound manually deleted
NR: Analyte not reported from this analysis

*: Result fails acceptance criteria
#: Acceptance criteria not applicable
?: Insufficient information to determine acceptance
e: Result >= MRL, but MRL less than low point of ICAL
c: check for co-elution

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Quantitation Report

Data File:	I:\LCMS01\DATA\20200217\20200217_010	**Instrument:**	E-LCMS-01
Acqu Date:	2/17/20 11:50	**Vial:**	24
Run Type:	LCS	**Dilution:**	1
Lab ID:	EQ2000051-02	**Raw Units:**	ng/mL

Bottle ID:		**Tier:**	II	**Matrix:**	Water
Prod Code:	ClO4 DOD	**Collect Date:**	1/23/20	**Receive Date:**	1/27/20

Analysis Lot:	670318	**Prep Lot:**	353630	**Report Group:**	EQ2000051
Analysis Method:	6850	**Prep Method:**	Method		
		Prep Date:	2/11/20		

Title:	Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass	**Calibration ID:**	EC2000001
		Report List ID:	21851

Internal Standard Compounds

Parameter Name	RT	RT Dev	Response	Solution Conc	Area Criteria
Sodium Perchlorate-18O4	3.159	+0.00	255372	1.00000	OK

Target Compounds

Final Conc.Units: ug/L

Parameter Name	RT	RT Dev	Response	Solution Conc	Final Conc	Q	Rpt?
Perchlorate	3.160		29539	0.85554	0.856		Y

Prep Amount:	10 mL	**Dilution:**	1
Prep Final Amount:	10.00 mL	**Basis Factor:**	100.00

U: Undetected at or above MDL
J: Analyte detected above MDL, but below MRL
B: Hit above MRL also found in Method Blank
E: Analyte concentration above high point of ICAL
N: Presumptive evidence of compound

D: Result from dilution
m: Manual integration performed
d: Compound manually deleted
NR: Analyte not reported from this analysis

*: Result fails acceptance criteria
#: Acceptance criteria not applicable
?: Insufficient information to determine acceptance
e: Result >= MRL, but MRL less than low point of ICAL
c: check for co-elution

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Quantitation Report

Data File:	I:\LCMS01\DATA\20200217\20200217_035	**Instrument:**	E-LCMS-01
Acqu Date:	2/17/20 16:15	**Vial:**	26
Run Type:	DLCS	**Dilution:**	1
Lab ID:	EQ2000051-03	**Raw Units:**	ng/mL

Bottle ID:		**Tier:**	II	**Matrix:**	Water
Prod Code:	ClO4 DOD	**Collect Date:**	1/23/20	**Receive Date:**	1/27/20

Analysis Lot:	670318	**Prep Lot:**	353630	**Report Group:**	EQ2000051
Analysis Method:	6850	**Prep Method:**	Method		
		Prep Date:	2/11/20		

Title:	Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass	**Calibration ID:**	EC2000001
		Report List ID:	21851

Internal Standard Compounds

Parameter Name	RT	RT Dev	Response	Solution Conc	Area Criteria
Sodium Perchlorate-18O4	3.105	-0.05	287501	1.00000	OK

Target Compounds

Final Conc.Units: ug/L

Parameter Name	RT	RT Dev	Response	Solution Conc	Final Conc	Q	Rpt?
Perchlorate	3.106	-0.05	32714	0.84160	0.842		Y

Prep Amount:	10 mL	**Dilution:**	1
Prep Final Amount:	10.00 mL	**Basis Factor:**	100.00

U: Undetected at or above MDL
J: Analyte detected above MDL, but below MRL
B: Hit above MRL also found in Method Blank
E: Analyte concentration above high point of ICAL
N: Presumptive evidence of compound

D: Result from dilution
m: Manual integration performed
d: Compound manually deleted
NR: Analyte not reported from this analysis

*: Result fails acceptance criteria
#: Acceptance criteria not applicable
?: Insufficient information to determine acceptance
e: Result >= MRL, but MRL less than low point of ICAL
c: check for co-elution

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Quantitation Report

Data File:	I:\LCMS01\DATA\20200217\20200217_012	**Instrument:**	E-LCMS-01
Acqu Date:	2/17/20 12:05	**Vial:**	1
Run Type:	N/A	**Dilution:**	1
Lab ID:	E2000074-001	**Raw Units:**	ng/mL

Bottle ID:	E2000074-001.01	**Tier:**	IV	**Matrix:**	Water
Prod Code:	ClO4 DOD	**Collect Date:**	1/23/20	**Receive Date:**	1/27/20

Analysis Lot:	670318	**Prep Lot:**	353630	**Report Group:**	E2000074
Analysis Method:	6850	**Prep Method:**	Method		
		Prep Date:	2/11/20		

Title:	Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass	**Calibration ID:**	EC2000001
		Report List ID:	21851

Internal Standard Compounds

Parameter Name	RT	RT Dev	Response	Solution Conc	Area Criteria
Sodium Perchlorate-18O4	3.142	-0.02	338697	1.00000	OK

Target Compounds

Final Conc.Units: ug/L

Parameter Name	RT	RT Dev	Response	Solution Conc	Final Conc	Q	Rpt?
Perchlorate	3.147	-0.01	6244	0.13634	0.136		Y

Prep Amount:	10 mL	**Dilution:**	1
Prep Final Amount:	10.00 mL	**Basis Factor:**	100.00

U: Undetected at or above MDL
J: Analyte detected above MDL, but below MRL
B: Hit above MRL also found in Method Blank
E: Analyte concentration above high point of ICAL
N: Presumptive evidence of compound

D: Result from dilution
m: Manual integration performed
d: Compound manually deleted
NR: Analyte not reported from this analysis

*: Result fails acceptance criteria
#: Acceptance criteria not applicable
?: Insufficient information to determine acceptance
e: Result >= MRL, but MRL less than low point of ICAL
c: check for co-elution

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ALS Group Houston

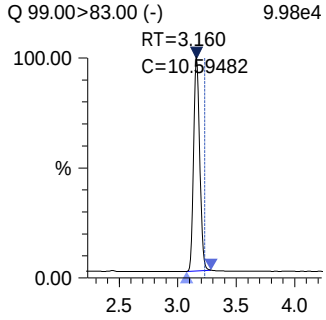
20200217_007

Sample ID: PERCHLORATE7
Date acquired: 2/17/2020 11:26:26 AM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200217\20200217_007.lcd
Vial: 3 | Inj. Volume: 25.0000uL | Tray: 1

Name	Data Filename	Sample ID	Found RT	Area	Conc.	Acquired Date	Cal Point	Dil. Factor	Inj Vol	ISTD Area	Tray	Vial
Perchlorate	20200217_007	PERCHLORATE7	3.160	361516	10.59482	2/17/2020 11:26:26 AM	No	1.00000	25.0000	252380	1	3
Sodium Perchlorate-18O4_IS	20200217_007	PERCHLORATE7	3.158	252380	1.00000	2/17/2020 11:26:26 AM	No	1.00000	25.0000	252380	1	3

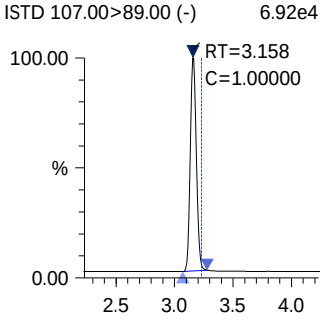
Perchlorate

Conc 10.59482
Area 361516



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 252380



ALS Group Houston

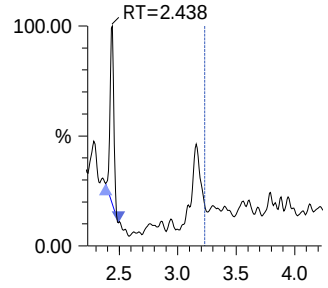
20200217_009

Sample ID: EQ2000051-01
Date acquired: 2/17/2020 11:42:11 AM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200217\20200217_009.lcd
Vial: 5 | Inj. Volume: 25.0000uL | Tray: 1

Name	Data Filename	Sample ID	Found RT	Area	Conc.	Acquired Date	Cal Point	Dil. Factor	Inj Vol	ISTD Area	Tray	Vial
Perchlorate	20200217_009	EQ2000051-01	----	----	----	2/17/2020 11:42:11 AM	No	1.00000	25.0000	158257	1	5
Sodium Perchlorate-18O4_IS	20200217_009	EQ2000051-01	3.158	158257	1.00000	2/17/2020 11:42:11 AM	No	1.00000	25.0000	158257	1	5

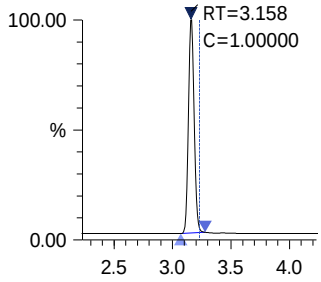
Perchlorate

Conc ----
Area ----
Q 99.00>83.00 (-) 3.96e2



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 158257
ISTD 107.00>89.00 (-) 4.61e4



ALS Group Houston

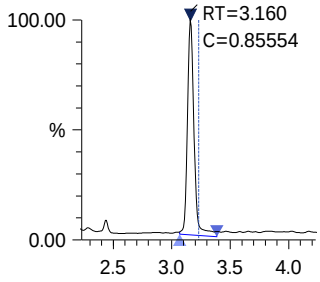
20200217_010

Sample ID: EQ2000051-02
Date acquired: 2/17/2020 11:50:05 AM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200217\20200217_010.lcd
Vial: 6 | Inj. Volume: 25.0000uL | Tray: 1

Name	Data Filename	Sample ID	Found RT	Area	Conc.	Acquired Date	Cal Point	Dil. Factor	Inj Vol	ISTD Area	Tray	Vial
Perchlorate	20200217_010	EQ2000051-02	3.160	29539	0.85554	2/17/2020 11:50:05 AM	No	1.00000	25.0000	255372	1	6
Sodium Perchlorate-18O4_IS	20200217_010	EQ2000051-02	3.159	255372	1.00000	2/17/2020 11:50:05 AM	No	1.00000	25.0000	255372	1	6

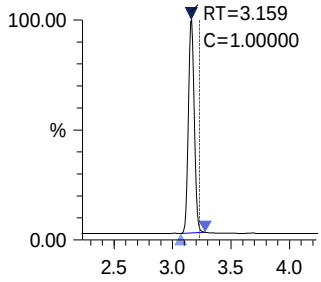
Perchlorate

Conc 0.85554
Area 29539
Q 99.00>83.00 (-) 7.48e3



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 255372
ISTD 107.00>89.00 (-) 7.19e4



ALS Group Houston

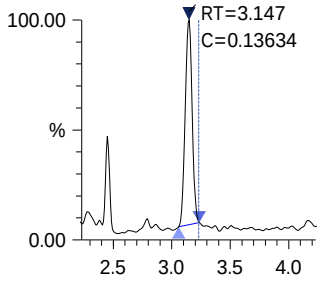
20200217_012

Sample ID: E2000074-001
Date acquired: 2/17/2020 12:05:53 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200217\20200217_012.lcd
Vial: 8 | Inj. Volume: 25.0000uL | Tray: 1

Name	Data Filename	Sample ID	Found RT	Area	Conc.	Acquired Date	Cal Point	Dil. Factor	Inj Vol	ISTD Area	Tray	Vial
Perchlorate	20200217_012	E2000074-001	3.147	6244	0.13634	2/17/2020 12:05:53 PM	No	1.00000	25.0000	338697	1	8
Sodium Perchlorate-18O4_IS	20200217_012	E2000074-001	3.142	338697	1.00000	2/17/2020 12:05:53 PM	No	1.00000	25.0000	338697	1	8

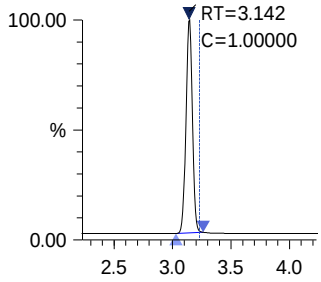
Perchlorate

Conc 0.13634
Area 6244
Q 99.00>83.00 (-) 1.57e3



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 338697
ISTD 107.00>89.00 (-) 8.90e4



ALS Group Houston

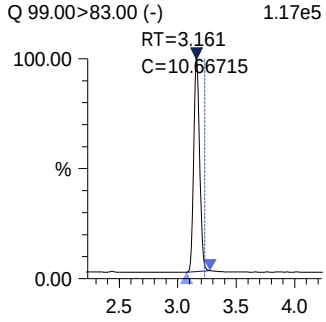
PERCHLORATE7

Date acquired: 2/17/2020 12:29:39 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200217\20200217_015.lcd
Vial: 3 | Inj. Volume: 25.0000uL | Tray: 1

Name	Data Filename	Sample ID	Found RT	Area	Conc.	Acquired Date	Cal Point	Dil. Factor	Inj Vol	ISTD Area	Tray	Vial
Perchlorate	20200217_015	PERCHLORATE7	3.161	407931	10.66715	2/17/2020 12:29:39 PM	No	1.00000	25.0000	282852	1	3
Sodium Perchlorate-18O4_IS	20200217_015	PERCHLORATE7	3.159	282852	1.00000	2/17/2020 12:29:39 PM	No	1.00000	25.0000	282852	1	3

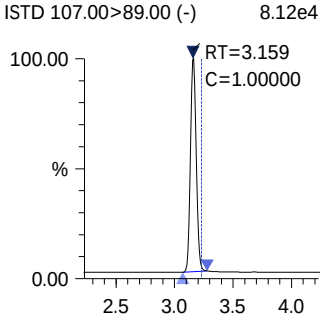
Perchlorate

Conc 10.66715
Area 407931



Sodium Perchlorate-18O4 _IS

Conc 1.00000
Area 282852



ALS Group Houston

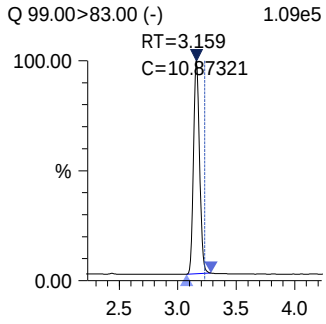
PERCHLORATE7

Date acquired: 2/17/2020 1:48:35 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200217\20200217_025.lcd
Vial: 3 | Inj. Volume: 25.0000uL | Tray: 1

Name	Data Filename	Sample ID	Found RT	Area	Conc.	Acquired Date	Cal Point	Dil. Factor	Inj Vol	ISTD Area	Tray	Vial
Perchlorate	20200217_025	PERCHLORATE7	3.159	391076	10.87321	2/17/2020 1:48:35 PM	No	1.00000	25.0000	266026	1	3
Sodium Perchlorate-18O4_IS	20200217_025	PERCHLORATE7	3.158	266026	1.00000	2/17/2020 1:48:35 PM	No	1.00000	25.0000	266026	1	3

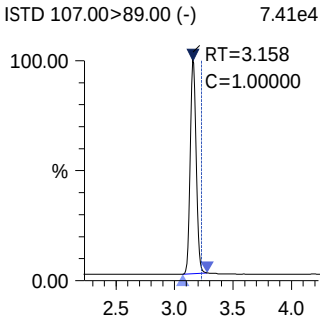
Perchlorate

Conc 10.87321
Area 391076



Sodium Perchlorate-18O4 _IS

Conc 1.00000
Area 266026



ALS Group Houston

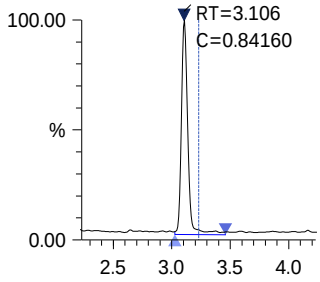
20200217_035

Sample ID: EQ2000051-03
Date acquired: 2/17/2020 4:15:43 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200217\20200217_035.lcd
Vial: 29 | Inj. Volume: 25.0000uL | Tray: 1

Name	Data Filename	Sample ID	Found RT	Area	Conc.	Acquired Date	Cal Point	Dil. Factor	Inj Vol	ISTD Area	Tray	Vial
Perchlorate	20200217_035	EQ2000051-03	3.106	32714	0.84160	2/17/2020 4:15:43 PM	No	1.00000	25.0000	287501	1	29
Sodium Perchlorate-18O4_IS	20200217_035	EQ2000051-03	3.105	287501	1.00000	2/17/2020 4:15:43 PM	No	1.00000	25.0000	287501	1	29

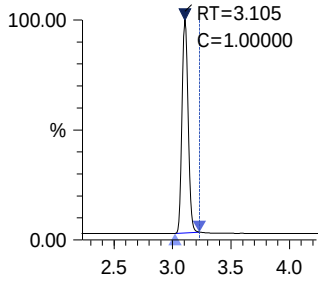
Perchlorate

Conc 0.84160
Area 32714
Q 99.00>83.00 (-) 8.39e3



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 287501
ISTD 107.00>89.00 (-) 8.11e4



ALS Group Houston

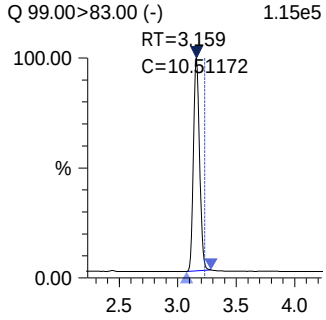
20200217_036

Sample ID: PERCHLORATE7
Date acquired: 2/17/2020 4:23:39 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200217\20200217_036.lcd
Vial: 3 | Inj. Volume: 25.0000uL | Tray: 1

Name	Data Filename	Sample ID	Found RT	Area	Conc.	Acquired Date	Cal Point	Dil. Factor	Inj Vol	ISTD Area	Tray	Vial
Perchlorate	20200217_036	PERCHLORATE7	3.159	417294	10.51172	2/17/2020 4:23:39 PM	No	1.00000	25.0000	293622	1	3
Sodium Perchlorate-18O4_IS	20200217_036	PERCHLORATE7	3.158	293622	1.00000	2/17/2020 4:23:39 PM	No	1.00000	25.0000	293622	1	3

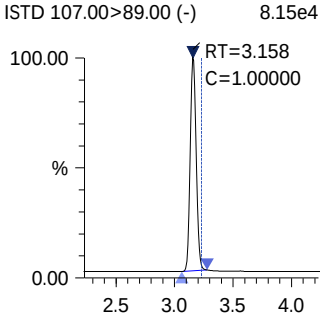
Perchlorate

Conc 10.51172
Area 417294



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 293622



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February 05, 2020

Analytical Report for Service Request No: K2000719

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

RE: HS20011091

Dear RJ,

Enclosed are the results of the sample(s) submitted to our laboratory January 25, 2020
For your reference, these analyses have been assigned our service request number **K2000719.**

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. All results are intended to be considered in their entirety, and ALS Group USA Corp. dba ALS Environmental (ALS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please contact me if you have any questions. My extension is 3350. You may also contact me via email at Kelley.Lovejoy@alsglobal.com.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Kelley Lovejoy

Kelley Lovejoy
Project Manager

RIGHT SOLUTIONS | RIGHT PARTNER

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Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LOD	Limit of Detection
LOQ	Limit of Quantitation
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

Inorganic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
E	The result is an estimate amount because the value exceeded the instrument calibration range.
J	The result is an estimated value.
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
i	The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
X	See case narrative.
Q	See case narrative. One or more quality control criteria was outside the limits.
H	The holding time for this test is immediately following sample collection. The samples were analyzed as soon as possible after receipt by the laboratory.

Metals Data Qualifiers

#	The control limit criteria is not applicable. See case narrative.
J	The result is an estimated value.
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
M	The duplicate injection precision was not met.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.
S	The reported value was determined by the Method of Standard Additions (MSA).
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
i	The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
X	See case narrative.
+	The correlation coefficient for the MSA is less than 0.995.
Q	See case narrative. One or more quality control criteria was outside the limits.

Organic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
A	A tentatively identified compound, a suspected aldol-condensation product.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
C	The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
D	The reported result is from a dilution.
E	The result is an estimated value.
J	The result is an estimated value.
N	The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
P	The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results.
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
i	The MRL/MDL or LOQ/LOD is elevated due to a chromatographic interference.
X	See case narrative.
Q	See case narrative. One or more quality control criteria was outside the limits.

Additional Petroleum Hydrocarbon Specific Qualifiers

F	The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
L	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
H	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
O	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
Y	The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
Z	The chromatographic fingerprint does not resemble a petroleum product.

ALS Group USA Corp. dba ALS Environmental (ALS) - Kelso
State Certifications, Accreditations, and Licenses

Agency	Web Site	Number
Alaska DEH	http://dec.alaska.gov/eh/lab/cs/csapproval.htm	UST-040
Arizona DHS	http://www.azdhs.gov/lab/license/env.htm	AZ0339
Arkansas - DEQ	http://www.adeq.state.ar.us/techsvs/labcert.htm	88-0637
California DHS (ELAP)	http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx	2795
DOD ELAP	http://www.denix.osd.mil/edqw/Accreditation/AccreditedLabs.cfm	L16-58-R4
Florida DOH	http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm	E87412
Hawaii DOH	http://health.hawaii.gov/	-
ISO 17025	http://www.pjlabs.com/	L16-57
Louisiana DEQ	http://www.deq.louisiana.gov/page/la-lab-accreditation	03016
Maine DHS	http://www.maine.gov/dhhs/	WA01276
Minnesota DOH	http://www.health.state.mn.us/accreditation	053-999-457
Nevada DEP	http://ndep.nv.gov/bsdw/labservice.htm	WA01276
New Jersey DEP	http://www.nj.gov/dep/enforcement/oqa.html	WA005
New York - DOH	https://www.wadsworth.org/regulatory/elap	12060
North Carolina DEQ	https://deq.nc.gov/about/divisions/water-resources/water-resources-data/water-sciences-home-page/laboratory-certification-branch/non-field-lab-certification	605
Oklahoma DEQ	http://www.deq.state.ok.us/CSDnew/labcert.htm	9801
Oregon – DEQ (NELAP)	http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	WA100010
South Carolina DHEC	http://www.scdhec.gov/environment/EnvironmentalLabCertification/	61002
Texas CEQ	http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html	T104704427
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C544
Wyoming (EPA Region 8)	https://www.epa.gov/region8-waterops/epa-region-8-certified-drinking-water-	-
Kelso Laboratory Website	www.alsglobal.com	NA

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. A complete listing of specific NELAP-certified analytes, can be found in the certification section at www.ALSGlobal.com or at the accreditation bodies web site.
Please refer to the certification and/or accreditation body's web site if samples are submitted for compliance purposes. The states highlighted above, require the analysis be listed on the state certification if used for compliance purposes and if the method/anlayte is offered by that state.

Case Narrative

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ALS Environmental

Client: ALS Environmental - US
Project: HS20011091
Sample Matrix: Water

Service Request: K2000719
Date Received: 01/25/2020

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:

One water sample was received for analysis at ALS Environmental on 01/25/2020. Any discrepancies upon initial sample inspection are annotated on the sample receipt and preservation form included within this report. The sample was stored at minimum in accordance with the analytical method requirements.

General Chemistry:

No significant anomalies were noted with this analysis.

Approved by Kelley Lovejoy Date 02/05/2020

Chain of Custody

ALS Environmental—Kelso Laboratory
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Houston, TX 77099
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F: +1 281 530 5887
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Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID:** **13191**

SUBCONTRACT TO:

ALS Environmental Kelso
1317 S. 13th Avenue
Kelso, WA 98626

Phone: +1 360 501 3312

k 2000719

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:	HS20011091
TSR:	Danielle Winnings

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS20011091-01**	**LH18/24-SP650_012320**	**Water**	**23 Jan 2020 14:00**
	TOC Analysis for DOD Level IV			03 Feb 2020

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: 1/24/2020 1800

Received By: _____ Date/Time: 1/28/2020

Cooler ID(s): _____ Temperature(s): _____

00968985

PC KL

Cooler Receipt and Preservation Form

Client ALS- Houston Service Request *K20* 000719

Received: 1/25/20 Opened: 1/25/20 By: KM Unloaded: 1/27/20 By: CG

1. Samples were received via? *USPS* (*Fed Ex*) *UPS* *DHL* *PDX* *Courier* *Hand Delivered*
2. Samples were received in: (circle) (*Cooler*) *Box* *Envelope* *Other* _____ *NA*
3. Were custody seals on coolers? NA (Y) (N) KM 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
3.7	3.8	-0.5	-0.4	+0.1	399	13191	1751 0293 9555	

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

Sample ID on Bottle	Sample ID on COC	Identified by:

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

Notes, Discrepancies, & Resolutions: _____

RUSH

General Chemistry

ALS Environmental—Kelso Laboratory
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www.alsglobal.com

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	K2000719
Project:	HS20011091	**Date Collected:**	01/23/20
Sample Matrix:	Water	**Date Received:**	01/25/20
Analysis Method:	SM 5310 C	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA

Carbon, Total Organic

Sample Name	Lab Code	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
LH18/24-SP650_012320	K2000719-001	**2.02**	0.50	0.20	0.07	1	01/30/20 23:33	
Method Blank	K2000719-MB	ND U	0.50	0.20	0.07	1	01/30/20 22:49	

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	K2000719
Project	HS20011091	**Date Collected:**	01/23/20
Sample Matrix:	Water	**Date Received:**	01/25/20
		Date Analyzed:	01/30/20

Replicate Sample Summary
General Chemistry Parameters

Sample Name:	LH18/24-SP650_012320	**Units:**	mg/L
Lab Code:	K2000719-001	**Basis:**	NA

Analyte Name	Analysis Method	LOQ	LOD	MDL	Sample Result	Duplicate Sample K2000719-001DUP Result	Average	RPD	RPD Limit
Carbon, Total Organic	SM 5310 C	0.50	0.20	0.07	2.02	1.97	2.00	3	10

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

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

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

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	K2000719
Project:	HS20011091	**Date Analyzed:**	01/30/20
Sample Matrix:	Water	**Date Extracted:**	NA

Lab Control Sample Summary
Carbon, Total Organic

Analysis Method:	SM 5310 C	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA
		Analysis Lot:	668439

Sample Name	Lab Code	Result	Spike Amount	% Rec	% Rec Limits
Lab Control Sample	K2000719-LCS	26.6	25.0	107	83-117

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US **Service Request:** K2000719
Project: HS20011091

Continuing Calibration Verification (CCV) Summary

Carbon, Total Organic

Analysis Method: SM 5310 C **Units:** mg/L

	Analysis Lot	Lab Code	Date Analyzed	True Value	Measured Value	Percent Recovery	Acceptance Limits
CCV1	668439	KQ2001484-01	01/30/20 22:20	25.0	24.9	99	90-110
CCV2	668439	KQ2001484-02	01/31/20 02:23	25.0	25.6	102	90-110
CCV3	668439	KQ2001484-03	01/31/20 07:33	25.0	25.6	103	90-110
CCV4	668439	KQ2001484-04	01/31/20 11:36	25.0	25.0	100	90-110

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US **Service Request:**K2000719
Project: HS20011091

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	668439	KQ2001484-05	01/30/20 22:35	0.50	0.20	0.07	ND	U
CCB2	668439	KQ2001484-06	01/31/20 02:37	0.50	0.20	0.07	ND	U
CCB3	668439	KQ2001484-07	01/31/20 07:48	0.50	0.20	0.07	ND	U
CCB4	668439	KQ2001484-08	01/31/20 11:51	0.50	0.20	0.07	ND	U

Raw Data

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
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General Chemistry

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
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Work Request # Original ( ) K2000534, 570, 584, 625, 719, 749, 670, 695, 729, 730, 846, 833, 886

Tier: II, IV, II, IV, IV, IV, II, IV, IV, II, I, II, II

Date Analyzed: 1/30/20

Analyst: BCP

Analysis: TOC/DOC

Run # TOC: 668439, 668440, DOC: 668441, 668442

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: K2000749-LMS reports a low %Rec, due to matrix interference. K2000584-1/1d, 695-1/1d, 695-2/2d report a high %RSD. However, these samples are less than 5x the MRL.

Final Approved by: [signature] Date: 02/04/20

DQREPORT

C:\Documents and Settings\adam.bradbury\My Documents\DATAQUAL.DOC

Analytical Results Summary

00968995

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 668439 **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
K2000534-016	Carbon, Total Organic	N/A		Water	17.24 mg/L	10 mL	17.2 mg/L	1	0.07	0.50			1/31/20 05:12:00	N	II
K2000534-017	Carbon, Total Organic	N/A		Water	1.53 mg/L	10 mL	153 mg/L	100	7	50			1/31/20 05:40:00	N	II
K2000534-018	Carbon, Total Organic	N/A		Water	2.29 mg/L	10 mL	229 mg/L	100	7	50			1/31/20 06:09:00	N	II
K2000570-001	Carbon, Total Organic	N/A		Storm Water	11.31 mg/L	10 mL	11.3 mg/L	1	0.07	0.50			1/31/20 06:37:00	N	IV
K2000570-002	Carbon, Total Organic	N/A		Storm Water	10.73 mg/L	10 mL	10.7 mg/L	1	0.07	0.50			1/31/20 07:05:00	N	IV
K2000584-001	Carbon, Total Organic	N/A		Water	1.18 mg/L	10 mL	118 mg/L	100	7	50			1/31/20 08:32:00	N	II
K2000625-004	Carbon, Total Organic	N/A		Water	4.60 mg/L	10 mL	4.60 mg/L	1	0.07	0.50			1/31/20 09:00:00	N	IV
K2000625-008	Carbon, Total Organic	N/A		Water	0.65 mg/L	10 mL	6.5 mg/L	10	0.7	5.0			1/31/20 09:28:00	N	IV
K2000625-010	Carbon, Total Organic	N/A		Water	16.09 mg/L	10 mL	16.1 mg/L	1	0.07	0.50			1/31/20 09:56:00	Y	IV
K2000625-011	Carbon, Total Organic	N/A		Water	5.24 mg/L	10 mL	105 mg/L	20	2	10			1/31/20 10:53:00	Y	IV
K2000719-001	Carbon, Total Organic	N/A		Water	2.02 mg/L	10 mL	2.02 mg/L	1	0.07	0.50			1/30/20 23:33:00	N	IV
K2000749-001	Carbon, Total Organic	N/A		Ground Water	21.02 mg/L	10 mL	21.0 mg/L	1	0.07	0.50			1/31/20 00:01:00	Y	IV
K2000749-002	Carbon, Total Organic	N/A		Ground Water	7.58 mg/L	10 mL	7.58 mg/L	1	0.07	0.50			1/31/20 00:59:00	N	IV
K2000749-003	Carbon, Total Organic	N/A		Ground Water	9.03 mg/L	10 mL	9.03 mg/L	1	0.07	0.50			1/31/20 01:27:00	N	IV
K2000749-004	Carbon, Total Organic	N/A		Ground Water	9.01 mg/L	10 mL	9.01 mg/L	1	0.07	0.50			1/31/20 01:55:00	N	IV
K2000749-005	Carbon, Total Organic	N/A		Ground Water	6.70 mg/L	10 mL	6.70 mg/L	1	0.07	0.50			1/31/20 02:52:00	N	IV
K2000749-006	Carbon, Total Organic	N/A		Ground Water	0.00 mg/L	10 mL	500 mg/L U	1000	70	500			1/31/20 03:20:00	N	IV
K2000749-007	Carbon, Total Organic	N/A		Ground Water	10.39 mg/L	10 mL	10.4 mg/L	1	0.07	0.50			1/31/20 03:48:00	N	IV
K2000749-008	Carbon, Total Organic	N/A		Ground Water	6.58 mg/L	10 mL	6.58 mg/L	1	0.07	0.50			1/31/20 04:16:00	N	IV
K2000749-009	Carbon, Total Organic	N/A		Ground Water	4.88 mg/L	10 mL	4.88 mg/L	1	0.07	0.50			1/31/20 04:44:00	N	IV
KQ2001484-01	Carbon, Total Organic	CCV		Water	24.87 mg/L	10 mL	24.9 mg/L	1					1/30/20 22:20:00	N	IV
KQ2001484-02	Carbon, Total Organic	CCV		Water	25.57 mg/L	10 mL	25.6 mg/L	1					1/31/20 02:23:00	N	IV
KQ2001484-03	Carbon, Total Organic	CCV		Water	25.63 mg/L	10 mL	25.6 mg/L	1					1/31/20 07:33:00	N	IV
KQ2001484-04	Carbon, Total Organic	CCV		Water	24.96 mg/L	10 mL	25.0 mg/L	1					1/31/20 11:36:00	N	IV
KQ2001484-05	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			1/30/20 22:35:00	N	IV
KQ2001484-06	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			1/31/20 02:37:00	N	IV
KQ2001484-07	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			1/31/20 07:48:00	N	IV
KQ2001484-08	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			1/31/20 11:51:00	N	IV
KQ2001484-09	Carbon, Total Organic	MB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			1/30/20 22:49:00	N	IV
KQ2001484-10	Carbon, Total Organic	LCS		Water	26.63 mg/L	10 mL	26.6 mg/L	1	0.07	0.50	107		1/30/20 23:04:00	N	IV

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

02/04/20

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 668439 **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
KQ2001484-11	Carbon, Total Organic	MS	K2000749-001	Ground Water	1.49 mg/L	10 mL	1.49 mg/L	1	0.07	0.50	-78*		1/31/20 00:30:00	N	IV
KQ2001484-12	Carbon, Total Organic	DUP	K2000534-016	Water	17.18 mg/L	10 mL	17.2 mg/L	1	0.07	0.50		<1	1/31/20 05:12:00	N	II
KQ2001484-13	Carbon, Total Organic	DUP	K2000534-017	Water	1.42 mg/L	10 mL	142 mg/L	100	7	50		8	1/31/20 05:40:00	N	II
KQ2001484-14	Carbon, Total Organic	DUP	K2000534-018	Water	2.31 mg/L	10 mL	231 mg/L	100	7	50		<1	1/31/20 06:09:00	N	II
KQ2001484-15	Carbon, Total Organic	DUP	K2000570-001	Storm Water	11.41 mg/L	10 mL	11.4 mg/L	1	0.07	0.50		<1	1/31/20 06:37:00	N	IV
KQ2001484-16	Carbon, Total Organic	DUP	K2000570-002	Storm Water	10.78 mg/L	10 mL	10.8 mg/L	1	0.07	0.50		<1	1/31/20 07:05:00	N	IV
KQ2001484-17	Carbon, Total Organic	DUP	K2000584-001	Water	0.80 mg/L	10 mL	80 mg/L	100	7	50		38*	1/31/20 08:32:00	N	II
KQ2001484-18	Carbon, Total Organic	DUP	K2000625-004	Water	4.55 mg/L	10 mL	4.55 mg/L	1	0.07	0.50		1	1/31/20 09:00:00	N	IV
KQ2001484-19	Carbon, Total Organic	DUP	K2000625-008	Water	0.63 mg/L	10 mL	6.3 mg/L	10	0.7	5.0		3	1/31/20 09:28:00	N	IV
KQ2001484-20	Carbon, Total Organic	DUP	K2000625-010	Water	16.64 mg/L	10 mL	16.6 mg/L	1	0.07	0.50		3	1/31/20 09:56:00	N	IV
KQ2001484-21	Carbon, Total Organic	DUP	K2000625-011	Water	5.25 mg/L	10 mL	105 mg/L	20	2	10		<1	1/31/20 10:53:00	N	IV
KQ2001484-22	Carbon, Total Organic	DUP	K2000719-001	Water	1.97 mg/L	10 mL	1.97 mg/L	1	0.07	0.50		3	1/30/20 23:33:00	N	IV
KQ2001484-23	Carbon, Total Organic	DUP	K2000749-002	Ground Water	7.39 mg/L	10 mL	7.39 mg/L	1	0.07	0.50		3	1/31/20 00:59:00	N	IV
KQ2001484-24	Carbon, Total Organic	DUP	K2000749-003	Ground Water	9.33 mg/L	10 mL	9.33 mg/L	1	0.07	0.50		3	1/31/20 01:27:00	N	IV
KQ2001484-25	Carbon, Total Organic	DUP	K2000749-004	Ground Water	8.83 mg/L	10 mL	8.83 mg/L	1	0.07	0.50		2	1/31/20 01:55:00	N	IV
KQ2001484-26	Carbon, Total Organic	DUP	K2000749-001	Ground Water	20.60 mg/L	10 mL	20.6 mg/L	1	0.07	0.50		2	1/31/20 00:01:00	N	IV
KQ2001484-27	Carbon, Total Organic	DUP	K2000749-005	Ground Water	6.57 mg/L	10 mL	6.57 mg/L	1	0.07	0.50		2	1/31/20 02:52:00	N	IV
KQ2001484-28	Carbon, Total Organic	DUP	K2000749-006	Ground Water	0.00 mg/L	10 mL	500 mg/L U	1000	70	500		NC	1/31/20 03:20:00	N	IV
KQ2001484-29	Carbon, Total Organic	DUP	K2000749-007	Ground Water	10.48 mg/L	10 mL	10.5 mg/L	1	0.07	0.50		<1	1/31/20 03:48:00	N	IV
KQ2001484-30	Carbon, Total Organic	DUP	K2000749-008	Ground Water	6.49 mg/L	10 mL	6.49 mg/L	1	0.07	0.50		1	1/31/20 04:16:00	N	IV
KQ2001484-31	Carbon, Total Organic	DUP	K2000749-009	Ground Water	4.76 mg/L	10 mL	4.76 mg/L	1	0.07	0.50		2	1/31/20 04:44:00	N	IV
KQ2001484-32	Carbon, Total Organic	MS	K2000625-010	Water	32.38 mg/L	10 mL	130 mg/L	4	0.3	2.0	113		1/31/20 10:24:00	N	IV
KQ2001484-33	Carbon, Total Organic	MS	K2000625-011	Water	27.93 mg/L	10 mL	2790 mg/L	100	7	50	108		1/31/20 11:21:00	N	IV

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

Analytical Results Summary

00968997

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 668440 **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
K2000625-012	Carbon, Total Organic	N/A		Water	0.94 mg/L	10 mL	94 mg/L	100	7	50			1/31/20 12:05:00	Y	IV
K2000670-002	Carbon, Total Organic	N/A		Water	21.87 mg/L	10 mL	21.9 mg/L	1	0.07	0.50			1/31/20 15:23:00	N	II
K2000695-001	Carbon, Total Organic	N/A		Water	0.30 mg/L	10 mL	0.30 mg/L J	1	0.07	0.50			1/31/20 15:51:00	N	IV
K2000695-002	Carbon, Total Organic	N/A		Water	0.26 mg/L	10 mL	0.26 mg/L J	1	0.07	0.50			1/31/20 17:18:00	N	IV
K2000729-038	Carbon, Total Organic	N/A		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			1/31/20 17:46:00	N	IV
K2000730-001	Carbon, Total Organic	N/A		Water	0.50 mg/L	10 mL	0.50 mg/L J	1	0.07	0.50			1/31/20 18:14:00	N	II
K2000730-002	Carbon, Total Organic	N/A		Water	0.44 mg/L	10 mL	0.44 mg/L J	1	0.07	0.50			1/31/20 18:43:00	N	II
K2000730-003	Carbon, Total Organic	N/A		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			1/31/20 19:11:00	N	II
K2000730-004	Carbon, Total Organic	N/A		Water	2.59 mg/L	10 mL	2.59 mg/L	1	0.07	0.50			1/31/20 19:39:00	N	II
K2000730-005	Carbon, Total Organic	N/A		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			1/31/20 20:07:00	N	II
K2000730-006	Carbon, Total Organic	N/A		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			1/31/20 20:35:00	N	II
K2000730-007	Carbon, Total Organic	N/A		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			1/31/20 21:32:00	N	II
K2000730-008	Carbon, Total Organic	N/A		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			1/31/20 22:01:00	N	II
K2000846-001	Carbon, Total Organic	N/A		Water	3.82 mg/L	10 mL	3.82 mg/L	1	0.07	0.50			1/31/20 13:03:00	N	I
K2000846-002	Carbon, Total Organic	N/A		Water	2.05 mg/L	10 mL	2.05 mg/L	1	0.07	0.50			1/31/20 13:31:00	N	I
K2000846-003	Carbon, Total Organic	N/A		Water	1.96 mg/L	10 mL	1.96 mg/L	1	0.07	0.50			1/31/20 13:59:00	N	I
K2000846-004	Carbon, Total Organic	N/A		Water	2.10 mg/L	10 mL	2.10 mg/L	1	0.07	0.50			1/31/20 14:27:00	N	I
K2000846-005	Carbon, Total Organic	N/A		Water	1.96 mg/L	10 mL	1.96 mg/L	1	0.07	0.50			1/31/20 14:55:00	N	I
KQ2001485-01	Carbon, Total Organic	CCV		Water	24.96 mg/L	10 mL	25.0 mg/L	1					1/31/20 11:36:00	N	IV
KQ2001485-02	Carbon, Total Organic	CCV		Water	24.64 mg/L	10 mL	24.6 mg/L	1					1/31/20 16:19:00	N	IV
KQ2001485-03	Carbon, Total Organic	CCV		Water	24.37 mg/L	10 mL	24.4 mg/L	1					1/31/20 21:03:00	N	IV
KQ2001485-04	Carbon, Total Organic	CCV		Water	24.53 mg/L	10 mL	24.5 mg/L	1					2/1/20 01:47:00	N	IV
KQ2001485-05	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			1/31/20 11:51:00	N	IV
KQ2001485-06	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			1/31/20 16:34:00	N	IV
KQ2001485-07	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			1/31/20 21:18:00	N	IV
KQ2001485-08	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			2/1/20 02:01:00	N	IV
KQ2001485-09	Carbon, Total Organic	MB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			1/31/20 08:03:00	N	IV
KQ2001485-10	Carbon, Total Organic	LCS		Water	27.91 mg/L	10 mL	27.9 mg/L	1	0.07	0.50	112		1/31/20 08:17:00	N	IV
KQ2001485-11	Carbon, Total Organic	MS	K2000625-012	Water	27.15 mg/L	10 mL	10900 mg/L	400	30	200	108		1/31/20 12:33:00	N	IV
KQ2001485-12	Carbon, Total Organic	DUP	K2000670-002	Water	22.31 mg/L	10 mL	22.3 mg/L	1	0.07	0.50		2	1/31/20 15:23:00	N	II
KQ2001485-13	Carbon, Total Organic	DUP	K2000695-002	Water	0.19 mg/L	10 mL	0.19 mg/L J	1	0.07	0.50		31*	1/31/20 17:18:00	N	IV
KQ2001485-14	Carbon, Total Organic	DUP	K2000695-001	Water	0.21 mg/L	10 mL	0.21 mg/L J	1	0.07	0.50		35*	1/31/20 15:51:00	N	IV
KQ2001485-15	Carbon, Total Organic	DUP	K2000625-012	Water	0.92 mg/L	10 mL	92 mg/L	100	7	50		2	1/31/20 12:05:00	N	IV
KQ2001485-16	Carbon, Total Organic	DUP	K2000729-038	Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	1/31/20 17:46:00	N	IV
KQ2001485-17	Carbon, Total Organic	DUP	K2000730-001	Water	0.51 mg/L	10 mL	0.51 mg/L	1	0.07	0.50		2	1/31/20 18:14:00	N	II
KQ2001485-18	Carbon, Total Organic	DUP	K2000730-002	Water	0.47 mg/L	10 mL	0.47 mg/L J	1	0.07	0.50		7	1/31/20 18:43:00	N	II

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

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Results Summary

02/04/20

Analytical Results Summary

00968998

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 668440 **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
KQ2001485-19	Carbon, Total Organic	DUP	K2000730-003	Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	1/31/20 19:11:00	N	II
KQ2001485-20	Carbon, Total Organic	DUP	K2000730-004	Water	2.55 mg/L	10 mL	2.55 mg/L	1	0.07	0.50		2	1/31/20 19:39:00	N	II
KQ2001485-21	Carbon, Total Organic	DUP	K2000730-005	Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	1/31/20 20:07:00	N	II
KQ2001485-22	Carbon, Total Organic	DUP	K2000730-006	Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	1/31/20 20:35:00	N	II
KQ2001485-23	Carbon, Total Organic	DUP	K2000730-007	Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	1/31/20 21:32:00	N	II
KQ2001485-24	Carbon, Total Organic	DUP	K2000730-008	Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	1/31/20 22:01:00	N	II
KQ2001485-25	Carbon, Total Organic	DUP	K2000846-001	Water	3.78 mg/L	10 mL	3.78 mg/L	1	0.07	0.50		1	1/31/20 13:03:00	N	I
KQ2001485-26	Carbon, Total Organic	DUP	K2000846-002	Water	1.97 mg/L	10 mL	1.97 mg/L	1	0.07	0.50		4	1/31/20 13:31:00	N	I
KQ2001485-27	Carbon, Total Organic	DUP	K2000846-003	Water	1.91 mg/L	10 mL	1.91 mg/L	1	0.07	0.50		2	1/31/20 13:59:00	N	I
KQ2001485-28	Carbon, Total Organic	DUP	K2000846-004	Water	2.11 mg/L	10 mL	2.11 mg/L	1	0.07	0.50		<1	1/31/20 14:27:00	N	I
KQ2001485-29	Carbon, Total Organic	DUP	K2000846-005	Water	1.91 mg/L	10 mL	1.91 mg/L	1	0.07	0.50		3	1/31/20 14:55:00	N	I

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

Analytical Results Summary

00968999

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 668441 **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
K2000833-001	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	6.10 mg/L	10 mL	6.10 mg/L	1	0.07	0.50			1/31/20 22:43:00	N	II
K2000833-002	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	4.98 mg/L	10 mL	4.98 mg/L	1	0.07	0.50			1/31/20 23:12:00	N	II
K2000833-003	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	0.98 mg/L	10 mL	0.98 mg/L	1	0.07	0.50			1/31/20 23:40:00	N	II
K2000833-004	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	3.95 mg/L	10 mL	3.95 mg/L	1	0.07	0.50			2/1/20 00:08:00	N	II
K2000833-005	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	1.96 mg/L	10 mL	1.96 mg/L	1	0.07	0.50			2/1/20 00:36:00	N	II
K2000833-006	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	3.85 mg/L	10 mL	3.85 mg/L	1	0.07	0.50			2/1/20 01:04:00	N	II
K2000833-007	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	5.64 mg/L	10 mL	5.64 mg/L	1	0.07	0.50			2/1/20 02:45:00	N	II
K2000833-008	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	5.16 mg/L	10 mL	5.16 mg/L	1	0.07	0.50			2/1/20 03:14:00	N	II
K2000833-009	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	5.32 mg/L	10 mL	5.32 mg/L	1	0.07	0.50			2/1/20 03:42:00	N	II
K2000833-010	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	3.32 mg/L	10 mL	3.32 mg/L	1	0.07	0.50			2/1/20 04:10:00	N	II
K2000833-011	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	5.11 mg/L	10 mL	5.11 mg/L	1	0.07	0.50			2/1/20 04:38:00	N	II
K2000833-012	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	3.95 mg/L	10 mL	3.95 mg/L	1	0.07	0.50			2/1/20 05:06:00	N	II
KQ2001486-01	Carbon, Dissolved Organic (DOC)	CCV		Surface Water	24.37 mg/L	10 mL	24.4 mg/L	1					1/31/20 21:03:00	N	II
KQ2001486-02	Carbon, Dissolved Organic (DOC)	CCV		Surface Water	24.53 mg/L	10 mL	24.5 mg/L	1					2/1/20 01:47:00	N	II
KQ2001486-03	Carbon, Dissolved Organic (DOC)	CCV		Surface Water	24.21 mg/L	10 mL	24.2 mg/L	1					2/1/20 06:17:00	N	II
KQ2001486-04	Carbon, Dissolved Organic (DOC)	CCB		Surface Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			1/31/20 21:18:00	N	II
KQ2001486-05	Carbon, Dissolved Organic (DOC)	CCB		Surface Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			2/1/20 02:01:00	N	II
KQ2001486-06	Carbon, Dissolved Organic (DOC)	CCB		Surface Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			2/1/20 06:31:00	N	II
KQ2001486-07	Carbon, Dissolved Organic (DOC)	MB		Surface Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			1/31/20 16:49:00	N	II
KQ2001486-08	Carbon, Dissolved Organic (DOC)	LCS		Surface Water	26.55 mg/L	10 mL	26.6 mg/L	1	0.07	0.50	106		1/31/20 17:03:00	N	II
KQ2001486-09	Carbon, Dissolved Organic (DOC)	MS	K2000833-001	Surface Water	29.49 mg/L	10 mL	59.0 mg/L	2	0.2	1.0	106		2/1/20 01:32:00	N	II
KQ2001486-10	Carbon, Dissolved Organic (DOC)	DUP	K2000833-001	Surface Water	5.93 mg/L	10 mL	5.93 mg/L	1	0.07	0.50		3	1/31/20 22:43:00	N	II
KQ2001486-11	Carbon, Dissolved Organic (DOC)	DUP	K2000833-002	Surface Water	4.88 mg/L	10 mL	4.88 mg/L	1	0.07	0.50		2	1/31/20 23:12:00	N	II

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

02/04/20

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 668441 **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
KQ2001486-12	Carbon, Dissolved Organic (DOC)	DUP	K2000833-003	Surface Water	0.90 mg/L	10 mL	0.90 mg/L	1	0.07	0.50		8	1/31/20 23:40:00	N	II
KQ2001486-13	Carbon, Dissolved Organic (DOC)	DUP	K2000833-004	Surface Water	3.95 mg/L	10 mL	3.95 mg/L	1	0.07	0.50		<1	2/1/20 00:08:00	N	II
KQ2001486-14	Carbon, Dissolved Organic (DOC)	DUP	K2000833-005	Surface Water	2.02 mg/L	10 mL	2.02 mg/L	1	0.07	0.50		3	2/1/20 00:36:00	N	II
KQ2001486-15	Carbon, Dissolved Organic (DOC)	DUP	K2000833-006	Surface Water	3.91 mg/L	10 mL	3.91 mg/L	1	0.07	0.50		1	2/1/20 01:04:00	N	II
KQ2001486-16	Carbon, Dissolved Organic (DOC)	DUP	K2000833-007	Surface Water	5.54 mg/L	10 mL	5.54 mg/L	1	0.07	0.50		2	2/1/20 02:45:00	N	II
KQ2001486-17	Carbon, Dissolved Organic (DOC)	DUP	K2000833-008	Surface Water	5.19 mg/L	10 mL	5.19 mg/L	1	0.07	0.50		<1	2/1/20 03:14:00	N	II
KQ2001486-18	Carbon, Dissolved Organic (DOC)	DUP	K2000833-009	Surface Water	5.32 mg/L	10 mL	5.32 mg/L	1	0.07	0.50		<1	2/1/20 03:42:00	N	II
KQ2001486-19	Carbon, Dissolved Organic (DOC)	DUP	K2000833-010	Surface Water	3.41 mg/L	10 mL	3.41 mg/L	1	0.07	0.50		3	2/1/20 04:10:00	N	II
KQ2001486-20	Carbon, Dissolved Organic (DOC)	DUP	K2000833-011	Surface Water	5.07 mg/L	10 mL	5.07 mg/L	1	0.07	0.50		<1	2/1/20 04:38:00	N	II
KQ2001486-21	Carbon, Dissolved Organic (DOC)	DUP	K2000833-012	Surface Water	3.88 mg/L	10 mL	3.88 mg/L	1	0.07	0.50		2	2/1/20 05:06:00	N	II

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

Analytical Results Summary

00969001

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 668442 **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
K2000866-001	Carbon, Dissolved Organic (DOC)	N/A		Water	0.52 mg/L	10 mL	0.52 mg/L	1	0.07	0.50			2/1/20 05:34:00	N	II
K2000866-002	Carbon, Dissolved Organic (DOC)	N/A		Water	1.45 mg/L	10 mL	1.45 mg/L	1	0.07	0.50			2/1/20 06:46:00	N	II
K2000866-003	Carbon, Dissolved Organic (DOC)	N/A		Water	1.33 mg/L	10 mL	1.33 mg/L	1	0.07	0.50			2/1/20 07:15:00	N	II
K2000866-004	Carbon, Dissolved Organic (DOC)	N/A		Water	1.41 mg/L	10 mL	1.41 mg/L	1	0.07	0.50			2/1/20 07:43:00	N	II
K2000866-005	Carbon, Dissolved Organic (DOC)	N/A		Water	1.00 mg/L	10 mL	1.00 mg/L	1	0.07	0.50			2/1/20 08:11:00	N	II
K2000866-006	Carbon, Dissolved Organic (DOC)	N/A		Water	0.76 mg/L	10 mL	0.76 mg/L	1	0.07	0.50			2/1/20 08:39:00	N	II
K2000866-007	Carbon, Dissolved Organic (DOC)	N/A		Water	0.52 mg/L	10 mL	0.52 mg/L	1	0.07	0.50			2/1/20 09:07:00	N	II
K2000866-008	Carbon, Dissolved Organic (DOC)	N/A		Water	1.02 mg/L	10 mL	1.02 mg/L	1	0.07	0.50			2/1/20 09:35:00	N	II
K2000866-009	Carbon, Dissolved Organic (DOC)	N/A		Water	0.92 mg/L	10 mL	0.92 mg/L	1	0.07	0.50			2/1/20 10:03:00	N	II
KQ2001487-01	Carbon, Dissolved Organic (DOC)	CCV		Water	24.53 mg/L	10 mL	24.5 mg/L	1					2/1/20 01:47:00	N	II
KQ2001487-02	Carbon, Dissolved Organic (DOC)	CCV		Water	24.21 mg/L	10 mL	24.2 mg/L	1					2/1/20 06:17:00	N	II
KQ2001487-03	Carbon, Dissolved Organic (DOC)	CCV		Water	24.09 mg/L	10 mL	24.1 mg/L	1					2/1/20 10:46:00	N	II
KQ2001487-04	Carbon, Dissolved Organic (DOC)	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			2/1/20 02:01:00	N	II
KQ2001487-05	Carbon, Dissolved Organic (DOC)	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			2/1/20 06:31:00	N	II
KQ2001487-06	Carbon, Dissolved Organic (DOC)	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			2/1/20 11:01:00	N	II
KQ2001487-07	Carbon, Dissolved Organic (DOC)	MS	K2000866-001	Water	28.00 mg/L	10 mL	28.0 mg/L	1	0.07	0.50	110		2/1/20 06:02:00	N	II
KQ2001487-08	Carbon, Dissolved Organic (DOC)	MB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			2/1/20 02:16:00	N	II
KQ2001487-09	Carbon, Dissolved Organic (DOC)	LCS		Water	25.87 mg/L	10 mL	25.9 mg/L	1	0.07	0.50	103		2/1/20 02:31:00	N	II
KQ2001487-10	Carbon, Dissolved Organic (DOC)	DUP	K2000866-001	Water	0.53 mg/L	10 mL	0.53 mg/L	1	0.07	0.50		2	2/1/20 05:34:00	N	II
KQ2001487-11	Carbon, Dissolved Organic (DOC)	DUP	K2000866-002	Water	1.44 mg/L	10 mL	1.44 mg/L	1	0.07	0.50		<1	2/1/20 06:46:00	N	II
KQ2001487-12	Carbon, Dissolved Organic (DOC)	DUP	K2000866-003	Water	1.33 mg/L	10 mL	1.33 mg/L	1	0.07	0.50		<1	2/1/20 07:15:00	N	II
KQ2001487-13	Carbon, Dissolved Organic (DOC)	DUP	K2000866-004	Water	1.41 mg/L	10 mL	1.41 mg/L	1	0.07	0.50		<1	2/1/20 07:43:00	N	II
KQ2001487-14	Carbon, Dissolved Organic (DOC)	DUP	K2000866-005	Water	0.97 mg/L	10 mL	0.97 mg/L	1	0.07	0.50		3	2/1/20 08:11:00	N	II

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

02/04/20

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 668442 **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
KQ2001487-15	Carbon, Dissolved Organic (DOC)	DUP	K2000866-006	Water	0.75 mg/L	10 mL	0.75 mg/L	1	0.07	0.50		2	2/1/20 08:39:00	N	II
KQ2001487-16	Carbon, Dissolved Organic (DOC)	DUP	K2000866-007	Water	0.50 mg/L	10 mL	0.50 mg/L	1	0.07	0.50		3	2/1/20 09:07:00	N	II
KQ2001487-17	Carbon, Dissolved Organic (DOC)	DUP	K2000866-008	Water	0.97 mg/L	10 mL	0.97 mg/L	1	0.07	0.50		5	2/1/20 09:35:00	N	II
KQ2001487-18	Carbon, Dissolved Organic (DOC)	DUP	K2000866-009	Water	0.83 mg/L	10 mL	0.83 mg/L	1	0.07	0.50		10	2/1/20 10:03:00	N	II

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

TOC: 668439, 668440
DOC: 668441, 668442

Schedule: 01302020

Version: 5
Instrument: Fusion1
Last Saved by: Fusion1 (Fusion1)
Last Saved on: 2020/01/30 19:58 - Thursday

Position	Sample Type	Sample ID	Method ID (Calibration ID)	Reps	Use	State
(Clean)	Clean	Clean		1	True	Ready
D	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	2	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)	1	True	Ready
C	Check Standard	[TOC] LCS [24.0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
2	Sample	ICS	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
3	Sample	K2000719-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
4	Sample	K2000749-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
5	Sample	K2000749-001.01 ms	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
6	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
7	Sample	K2000749-002.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
8	Sample	K2000749-003.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
9	Sample	K2000749-004.01	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
10	Sample	K2000749-005.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
11	Sample	K2000749-006.01 1000x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
12	Sample	K2000749-007.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
13	Sample	K2000749-008.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
14	Sample	K2000749-009.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
15	Sample	K2000534-016.05	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
16	Sample	K2000534-017.05 100x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
17	Sample	K2000534-018.05 100x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
18	Sample	K2000570-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
19	Sample	K2000570-002.01	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
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	K2000584-001.02 100x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
22	Sample	K2000625-004.12	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
23	Sample	K2000625-008.12 10x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
24	Sample	K2000625-010.12	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
25	Sample	K2000625-010.12 ms 4x	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
26	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
27	Sample	K2000625-011.12 20x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
28	Sample	K2000625-011.12 ms 100x	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
29	Sample	K2000625-012.12 100x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
30	Sample	K2000625-012.12 ms 400x	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
31	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
32	Sample	K2000846-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
33	Sample	K2000846-002.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
34	Sample	K2000846-003.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
35	Sample	K2000846-004.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
36	Sample	K2000846-005.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
37	Sample	K2000670-002.05	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
38	Sample	K2000695-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready

02/04/20

Schedule: 01302020

Position	Sample Type	Sample ID	Method ID (Calibration ID)	Reps	Use	State
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
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	K2000695-002.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
41	Sample	K2000729-038.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
42	Sample	K2000730-001.03	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
43	Sample	K2000730-002.02	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
44	Sample	K2000730-003.02	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
45	Sample	K2000730-004.02	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
46	Sample	K2000730-005.02	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
47	Sample	K2000730-006.02	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
48	Sample	K2000730-007.02	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
49	Sample	K2000730-008.02	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
50	Sample	FB 1/29/20 1600	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
51	Sample	K2000833-001.01 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
52	Sample	K2000833-002.01 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
53	Sample	K2000833-003.01 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
54	Sample	K2000833-004.01 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
55	Sample	K2000833-005.01 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
56	Sample	K2000833-006.01 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
57	Sample	K2000833-001.01 ms doc 2x	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	K2000833-007.01 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
60	Sample	K2000833-008.01 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
61	Sample	K2000833-009.01 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
62	Sample	K2000833-010.01 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
63	Sample	K2000833-011.01 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
64	Sample	K2000833-012.01 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
65	Sample	K2000833-001.01 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
66	Sample	K2000866-001.01 ms doc	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
67	Sample	K2000866-002.01 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
68	Sample	K2000866-003.01 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
69	Sample	K2000866-004.01 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
70	Sample	K2000866-005.01 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
71	Sample	K2000866-006.01 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
72	Sample	K2000866-007.01 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
73	Sample	K2000866-008.01 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
74	Sample	K2000866-009.01 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
75	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
					False	

Fusion Report - 01302020
Thursday, January 30, 2020 07:58 PM

(View - Reps, Unused Reps, Meta-Data, Signature, History)
Printed on 2020/02/01 12:38 - Saturday

Report Summary Information

Company Location:	Gen Chem Lab		
Schedule Name:	01302020	Engine Version:	1.1.5.1
Instrument Name:	Fusion1	Firmware Version:	1.2.0696
Report Version:	1 of 1	Connection:	RS232 COM1
Report Creation by Operators (schedule version):	Fusion1 (Fusion1) (v5)		
Comment:			

Report Results

02/04/20

Sample Type: Clean — From Schedule Version 5

	Pos	Analysis Type	Sample ID	Start Time
◆	(clean)		Clean	2020/01/30 19:58

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	12.84	16.66	3.82	49.60	05:22
2	TC Clean	12.96	16.71	3.75	50.11	04:04
3	TC Clean	7.40	11.36	3.96	50.12	03:47
4	TC Clean	6.84	10.71	3.87	50.04	03:53

Sample Type: Sample — From Schedule Version 5

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	D	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2020/01/30 20:20

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	9.28	13.20	3.92	50.11	10:29
2	TOC	0.0000	0.0000	8.49	12.52	4.03	50.12	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.6185 (IC) (v1344)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

Sample Type: Clean From Schedule Version 5

	Pos	Analysis Type	Sample ID	Start Time
◆	(clean)		Clean	2020/01/30 20:48

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	11.35	16.00	4.65	49.54	05:19
2	TC Clean	4.47	8.46	3.99	50.09	04:00
3	TC Clean	2.20	6.13	3.92	50.04	03:44
4	TC Clean	1.65	5.72	4.07	50.10	03:52

Sample Type: Clean From Schedule Version 5

	Pos	Analysis Type	Sample ID	Start Time
◆	(clean)		Clean	2020/01/30 21:10

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	0.92	4.69	3.77	49.54	05:20
2	TC Clean	4.74	8.66	3.92	50.04	03:59
3	TC Clean	2.41	6.28	3.87	49.98	03:53
4	TC Clean	1.73	5.74	4.01	50.00	03:54

Sample Type: Blank (Creating v1345) From Schedule Version 5

	Pos	Analysis Type	Sample ID	Start Time
◆	(blank)		Reagent/Acid Blank	2020/01/30 21:32

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	0.95	4.76	3.82	49.37	05:19
2	TC Clean	4.99	8.85	3.87	50.07	04:01
3	TC Clean	2.36	6.11	3.76	49.98	03:44
4	TC Clean	1.82	5.77	3.95	50.10	03:44
5	Reagent Blank	5.99	9.83	3.85	50.06	05:04
6	Acid Blank	1.47	5.28	3.81	49.70	05:27

Sample Type: Sample From Schedule Version 5

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	D	TOC	RB	0.1534 ppm	0.0000 ppm	0.0000%	2020/01/30 22:05

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.1534	1.5340	10.55	14.41	3.86	50.07	10:33

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	24.8716 ppm (PASS)	0.0000 ppm	0%	2020/01/30 22:20

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.8716	248.7162	167.46	171.33	3.87	50.07	10:28

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)	50 ppmC

Sample Type: Check Standard --> CCB From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2020/01/30 22:35

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	8.69	12.47	3.78	50.08	10:32

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)	0 ppmC

Sample Type: Sample From Schedule Version 5

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	1	TOC	MB1	0.0000 ppm	0.0000 ppm	0.0000%	2020/01/30 22:49

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time

1	TOC	0.0000	0.0000	7.91	11.66	3.75	50.06	10:33

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

Sample Type: Check Standard --> LCS From Schedule Version 5

	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)	26.6294 ppm (PASS)	0.0000 ppm	0%	2020/01/30 23:04

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	26.6294	266.2938	178.57	182.28	3.71	50.08	10:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos C
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)	25 ppmC

Sample Type: Sample From Schedule Version 5

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	2	TOC	ICS	0.2124 ppm	0.0000 ppm	0.0000%	2020/01/30 23:19

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.2124	2.1239	10.92	14.79	3.87	50.08	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	3	TOC	K2000719-001.01	1.9981 ppm	0.0365 ppm	1.8200%	2020/01/30 23:33

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.0239	20.2392	22.38	26.21	3.84	50.05	10:29
2	TOC	1.9724	19.7236	22.05	25.70	3.65	50.07	10:32

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	4	TOC	K2000749-001.01	20.8078 ppm	0.2950 ppm	1.4200%	2020/01/31 00:01

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	21.0164	210.1637	142.46	146.24	3.78	50.05	10:29

2	TOC	20.5992	205.9915	139.82	143.74	3.92	50.05	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	5	TOC	K2000749-001.01 ms	1.4882 ppm	0.0000 ppm	0.0000%	2020/01/31 00:30

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.4882	14.8824	18.99	22.72	3.73	50.06	10:32

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	6	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2020/01/31 00:44

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.90	11.86	3.96	50.05	10:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	7	TOC	K2000749-002.01	7.4834 ppm	0.1363 ppm	1.8200%	2020/01/31 00:59

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	7.5798	75.7982	57.50	61.02	3.51	50.08	10:28
2	TOC	7.3870	73.8703	56.29	60.08	3.80	50.05	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	8	TOC	K2000749-003.01	9.1803 ppm	0.2088 ppm	2.2700%	2020/01/31 01:27

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	9.0327	90.3265	66.69	70.47	3.77	50.04	10:26
2	TOC	9.3279	93.2793	68.56	72.29	3.73	50.04	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	9	TOC	K2000749-004.01	8.9160 ppm	0.1269 ppm	1.4200%	2020/01/31 01:55

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	9.0058	90.0576	66.52	70.35	3.83	50.04	10:29
2	TOC	8.8263	88.2626	65.39	69.25	3.86	50.06	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	25.5670 ppm (PASS)	0.0000 ppm	0%	2020/01/31 02:23

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	25.5670	255.6704	171.86	175.50	3.65	50.06	10:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)	50 ppmC

Sample Type: Check Standard --> CCB From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2020/01/31 02:37

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	8.02	11.78	3.77	50.07	10:30

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)	0 ppmC

Sample Type: Sample From Schedule Version 5

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	10	TOC	K2000749-005.01	6.6340 ppm	0.0939 ppm	1.4200%	2020/01/31 02:52

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	6.7005	67.0047	51.94	55.69	3.75	50.04	10:29
2	TOC	6.5676	65.6762	51.10	54.81	3.70	50.04	10:28

Dilution	Blank Contribution	Method	Calibration

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	11	TOC	K2000749-006.01 1000x	0.0000 ppm	0.0000 ppm	0.0000%	2020/01/31 03:20

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	9.36	13.21	3.85	50.04	10:31
2	TOC	0.0000	0.0000	8.91	12.77	3.86	50.05	10:23

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	12	TOC	K2000749-007.01	10.4351 ppm	0.0659 ppm	0.6300%	2020/01/31 03:48

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	10.3885	103.8853	75.26	78.89	3.63	50.04	10:29
2	TOC	10.4817	104.8169	75.85	79.52	3.67	50.01	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	13	TOC	K2000749-008.01	6.5320 ppm	0.0633 ppm	0.9700%	2020/01/31 04:16

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	6.5768	65.7679	51.16	54.99	3.83	50.06	10:27
2	TOC	6.4873	64.8727	50.60	54.24	3.64	50.03	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	14	TOC	K2000749-009.01	4.8193 ppm	0.0842 ppm	1.7500%	2020/01/31 04:44

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.8788	48.7881	40.43	44.29	3.86	50.02	10:26
2	TOC	4.7597	47.5972	39.67	43.46	3.79	50.02	10:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	15	TOC	K2000534-016.05	17.2091 ppm	0.0389 ppm	0.2300%	2020/01/31 05:12

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	17.2366	172.3658	118.56	122.19	3.63	50.05	10:28
2	TOC	17.1815	171.8154	118.22	121.92	3.70	50.03	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	16	TOC	K2000534-017.05 100x	1.4765 ppm	0.0825 ppm	5.5900%	2020/01/31 05:40

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.5349	15.3490	19.28	22.95	3.67	50.02	10:26
2	TOC	1.4182	14.1818	18.55	22.32	3.77	50.06	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	17	TOC	K2000534-018.05 100x	2.2967 ppm	0.0162 ppm	0.7100%	2020/01/31 06:09

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.2852	22.8520	24.03	27.84	3.81	50.11	10:28
2	TOC	2.3081	23.0813	24.17	27.94	3.77	50.03	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	18	TOC	K2000570-001.01	11.3581 ppm	0.0737 ppm	0.6500%	2020/01/31 06:37

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	11.3060	113.0600	81.06	84.70	3.63	49.99	10:27
2	TOC	11.4102	114.1023	81.72	85.39	3.67	49.94	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	19	TOC	K2000570-002.01	10.7557 ppm	0.0368 ppm	0.3400%	2020/01/31 07:05

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	10.7297	107.2968	77.42	80.96	3.54	49.91	10:28
2	TOC	10.7817	107.8171	77.75	81.31	3.56	49.88	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC)	CAS_salt_010711	CAS_salt_010711

(v1345) (v4) (v31)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	25.6295 ppm (PASS)	0.0000 ppm	0%	2020/01/31 07:33

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	25.6295	256.2951	172.25	175.97	3.72	49.86	10:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)	50 ppmC

Sample Type: Check Standard --> CCB From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2020/01/31 07:48

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	8.18	11.87	3.69	49.83	10:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)	0 ppmC

Sample Type: Sample From Schedule Version 5

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	20	TOC	MB2	0.0000 ppm	0.0000 ppm	0.0000%	2020/01/31 08:03

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.85	11.31	3.46	49.79	10:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

Sample Type: Check Standard --> LCS From Schedule Version 5

	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)	27.9141 ppm (PASS)	0.0000 ppm	0%	2020/01/31 08:17

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	27.9141	279.1409	186.70	190.32	3.62	49.77	10:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos C
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)	25 ppmC

Sample Type: Sample From Schedule Version 5

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	21	TOC	K2000584-001.02 100x	0.9890 ppm	0.2654 ppm	26.8300%	2020/01/31 08:32

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.1767	11.7667	17.02	20.76	3.74	49.73	10:26
2	TOC	0.8014	8.0137	14.65	18.29	3.64	49.70	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	22	TOC	K2000625-004.12	4.5756 ppm	0.0394 ppm	0.8600%	2020/01/31 09:00

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.6035	46.0346	38.69	42.62	3.94	49.70	10:27
2	TOC	4.5478	45.4779	38.33	42.04	3.71	49.72	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	23	TOC	K2000625-008.12 10x	0.6445 ppm	0.0136 ppm	2.1200%	2020/01/31 09:28

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.6541	6.5412	13.72	17.27	3.56	49.76	10:25
2	TOC	0.6348	6.3483	13.59	17.23	3.64	49.78	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	24	TOC	K2000625-010.12	16.3623 ppm	0.3881 ppm	2.3700%	2020/01/31 09:56

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	16.0879	160.8788	111.30	115.08	3.78	49.80	10:27
2	TOC	16.6367	166.3669	114.77	118.32	3.55	49.80	10:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	25	TOC	K2000625-010.12 ms 4x	32.3758 ppm	0.0000 ppm	0.0000%	2020/01/31 10:24

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	32.3758	323.7585	214.29	217.90	3.62	49.81	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	26	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2020/01/31 10:39

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	9.54	13.12	3.58	49.80	10:32

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	27	TOC	K2000625-011.12 20x	5.2436 ppm	0.0055 ppm	0.1000%	2020/01/31 10:53

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	5.2397	52.3973	42.71	46.37	3.66	49.82	10:30
2	TOC	5.2475	52.4748	42.76	46.44	3.69	49.82	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	28	TOC	K2000625-011.12 ms 100x	27.9296 ppm	0.0000 ppm	0.0000%	2020/01/31 11:21

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	27.9296	279.2958	186.17	189.90	3.73	49.82	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	24.9591 ppm (PASS)	0.0000 ppm	0%	2020/01/31 11:36

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.9591	249.5908	168.01	171.73	3.71	49.81	10:34

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)	50 ppmC

Sample Type: Check Standard --> CCB From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2020/01/31 11:51

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	7.67	11.49	3.82	49.82	10:32

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)	0 ppmC

Sample Type: Sample From Schedule Version 5

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	29	TOC	K2000625-012.12 100x	0.9263 ppm	0.0157 ppm	1.6900%	2020/01/31 12:05

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.9374	9.3738	15.51	19.27	3.77	49.80	10:28
2	TOC	0.9152	9.1524	15.37	19.20	3.84	49.82	10:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	30	TOC	K2000625-012.12 ms 400x	27.1527 ppm	0.0000 ppm	0.0000%	2020/01/31 12:33

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time

1	TOC	27.1527	271.5271	181.26	185.01	3.74	49.81	10:36

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	31	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2020/01/31 12:48

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.64	11.48	3.85	49.82	10:34

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	32	TOC	K2000846-001.01	3.7995 ppm	0.0323 ppm	0.8500%	2020/01/31 13:03

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.8223	38.2232	33.75	37.50	3.75	49.81	10:30
2	TOC	3.7766	37.7662	33.46	37.20	3.74	49.79	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	33	TOC	K2000846-002.01	2.0087 ppm	0.0544 ppm	2.7100%	2020/01/31 13:31

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.0472	20.4717	22.52	26.25	3.72	49.79	10:25
2	TOC	1.9703	19.7031	22.04	25.73	3.69	49.80	10:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	34	TOC	K2000846-003.01	1.9344 ppm	0.0309 ppm	1.6000%	2020/01/31 13:59

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.9562	19.5623	21.95	25.64	3.70	49.81	10:28
2	TOC	1.9126	19.1258	21.67	25.43	3.76	49.80	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	35	TOC	K2000846-004.01	2.1029 ppm	0.0091 ppm	0.4300%	2020/01/31 14:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	36	TOC	K2000846-005.01	1.9342 ppm	0.0412 ppm	2.1300%	2020/01/31 14:55

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.9633	19.6335	21.99	25.74	3.75	49.81	10:26
2	TOC	1.9051	19.0514	21.62	25.31	3.69	49.82	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	37	TOC	K2000670-002.05	22.0878 ppm	0.3150 ppm	1.4300%	2020/01/31 15:23

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	21.8650	218.6504	147.83	151.58	3.76	49.83	10:26
2	TOC	22.3106	223.1057	150.65	154.40	3.76	49.83	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	38	TOC	K2000695-001.01	0.2547 ppm	0.0639 ppm	25.0700%	2020/01/31 15:51

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.2998	2.9985	11.48	15.27	3.79	49.84	10:28
2	TOC	0.2095	2.0954	10.90	14.63	3.73	49.81	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	24.6420 ppm (PASS)	0.0000 ppm	0%	2020/01/31 16:19

Pos	Base Analysis	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time

	Type									
B	TOC	25 ppm	1	24.6420	246.4198	166.01	169.68	3.67	49.81	10:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)	50 ppmC

Sample Type: Check Standard --> CCB From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2020/01/31 16:34

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	7.27	11.05	3.78	49.82	10:33

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)	0 ppmC

Sample Type: Sample From Schedule Version 5

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	39	TOC	MB3	0.0000 ppm	0.0000 ppm	0.0000%	2020/01/31 16:49

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.56	10.34	3.79	49.82	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

Sample Type: Check Standard --> LCS From Schedule Version 5

	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)	26.5543 ppm (PASS)	0.0000 ppm	0%	2020/01/31 17:03

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	26.5543	265.5425	178.10	181.77	3.67	49.81	10:30

Completion State	Success Action	Method	Calibration	STD Conc - Pos C
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)	25 ppmC

Sample Type: Sample From Schedule Version 5

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	40	TOC	K2000695-002.01	0.2229 ppm	0.0489 ppm	21.9200%	2020/01/31 17:18

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.2575	2.5746	11.21	15.06	3.85	49.80	10:31
2	TOC	0.1883	1.8835	10.77	14.53	3.76	49.80	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	41	TOC	K2000729-038.01	0.0000 ppm	0.0000 ppm	0.0000%	2020/01/31 17:46

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.67	10.41	3.74	49.82	10:27
2	TOC	0.0000	0.0000	6.56	10.09	3.53	49.83	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	42	TOC	K2000730-001.03	0.5038 ppm	0.0075 ppm	1.4900%	2020/01/31 18:14

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.4985	4.9850	12.73	16.38	3.65	49.83	10:28
2	TOC	0.5091	5.0909	12.80	16.53	3.73	49.84	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	43	TOC	K2000730-002.02	0.4583 ppm	0.0215 ppm	4.6800%	2020/01/31 18:43

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.4431	4.4314	12.38	16.33	3.95	49.87	10:26
2	TOC	0.4735	4.7351	12.57	16.33	3.75	49.85	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	44	TOC	K2000730-003.02	0.0000 ppm	0.0000 ppm	0.0000%	2020/01/31 19:11

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time

1	TOC	0.0000	0.0000	9.46	13.09	3.63	49.86	10:28
2	TOC	0.0000	0.0000	9.33	13.04	3.71	49.87	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	45	TOC	K2000730-004.02	2.5669 ppm	0.0291 ppm	1.1300%	2020/01/31 19:39

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.5874	25.8743	25.94	29.68	3.74	49.87	10:28
2	TOC	2.5463	25.4631	25.68	29.50	3.82	49.88	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	46	TOC	K2000730-005.02	0.0000 ppm	0.0000 ppm	0.0000%	2020/01/31 20:07

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.26	10.93	3.67	49.88	10:27
2	TOC	0.0000	0.0000	7.09	10.82	3.73	49.88	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	47	TOC	K2000730-006.02	0.0000 ppm	0.0000 ppm	0.0000%	2020/01/31 20:35

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.39	11.12	3.74	49.90	10:27
2	TOC	0.0000	0.0000	7.44	11.22	3.78	49.89	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	24.3660 ppm (PASS)	0.0000 ppm	0%	2020/01/31 21:03

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.3660	243.6599	164.26	168.06	3.80	49.89	10:30

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)	50 ppmC

Sample Type: Check Standard --> CCB From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2020/01/31 21:18

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	6.78	10.52	3.73	49.91	10:30

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)	0 ppmC

Sample Type: Sample From Schedule Version 5

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	48	TOC	K2000730-007.02	0.0000 ppm	0.0000 ppm	0.0000%	2020/01/31 21:32

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.17	10.99	3.82	49.90	10:30
2	TOC	0.0000	0.0000	7.67	11.54	3.87	49.92	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	49	TOC	K2000730-008.02	0.0000 ppm	0.0000 ppm	0.0000%	2020/01/31 22:01

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.86	10.62	3.76	49.91	10:28
2	TOC	0.0000	0.0000	6.95	10.82	3.87	49.93	10:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	50	TOC	FB 1/29/20 1600	0.0000 ppm	0.0000 ppm	0.0000%	2020/01/31 22:29

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.80	10.57	3.76	49.94	10:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	51	TOC	K2000833-001.01 doc	6.0117 ppm	0.1221 ppm	2.0300%	2020/01/31 22:43

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	6.0980	60.9805	48.14	51.87	3.73	49.93	10:30
2	TOC	5.9253	59.2534	47.04	50.85	3.81	49.94	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	52	TOC	K2000833-002.01 doc	4.9342 ppm	0.0718 ppm	1.4600%	2020/01/31 23:12

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.9849	49.8494	41.10	44.78	3.68	49.93	10:25
2	TOC	4.8834	48.8340	40.46	44.15	3.69	49.95	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	53	TOC	K2000833-003.01 doc	0.9394 ppm	0.0526 ppm	5.6000%	2020/01/31 23:40

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.9766	9.7660	15.75	19.44	3.69	49.94	10:32
2	TOC	0.9023	9.0227	15.28	19.04	3.76	49.96	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	54	TOC	K2000833-004.01 doc	3.9488 ppm	0.0006 ppm	0.0100%	2020/02/01 00:08

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.9484	39.4838	34.54	38.16	3.61	49.96	10:25
2	TOC	3.9492	39.4917	34.55	38.37	3.82	49.95	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	55	TOC	K2000833-005.01 doc	1.9930 ppm	0.0431 ppm	2.1600%	2020/02/01 00:36

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.9626	19.6256	21.99	25.62	3.63	49.97	10:30
2	TOC	2.0234	20.2345	22.37	26.00	3.63	49.97	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	56	TOC	K2000833-006.01 doc	3.8770 ppm	0.0405 ppm	1.0400%	2020/02/01 01:04

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.8484	38.4842	33.91	37.44	3.53	49.99	10:26
2	TOC	3.9057	39.0567	34.27	37.89	3.61	49.98	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	57	TOC	K2000833-001.01 ms doc 2x	29.4855 ppm	0.0000 ppm	0.0000%	2020/02/01 01:32

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	29.4855	294.8553	196.01	199.72	3.71	49.97	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	24.5308 ppm (PASS)	0.0000 ppm	0%	2020/02/01 01:47

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.5308	245.3079	165.30	168.92	3.61	49.99	10:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)	50 ppmC

Sample Type: Check Standard --> CCB From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	D	TOC	0.0000	1:1	[TOC] CCB [0	0 / infinity	0.0000	0.0000	0%	2020/02/01 02:01

					ppm]	(NA / NA)	ppm (PASS)	ppm		

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	7.31	11.01	3.70	49.97	10:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)	0 ppmC

Sample Type: Sample From Schedule Version 5

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	58	TOC	MB4	0.0000 ppm	0.0000 ppm	0.0000%	2020/02/01 02:16

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.75	10.46	3.71	49.96	10:33

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

Sample Type: Check Standard --> LCS From Schedule Version 5

	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)	25.8663 ppm (PASS)	0.0000 ppm	0%	2020/02/01 02:31

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	25.8663	258.6627	173.75	177.43	3.68	49.97	10:30

Completion State	Success Action	Method	Calibration	STD Conc - Pos C
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)	25 ppmC

Sample Type: Sample From Schedule Version 5

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	59	TOC	K2000833-007.01 doc	5.5893 ppm	0.0701 ppm	1.2500%	2020/02/01 02:45

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	5.6389	56.3892	45.23	49.06	3.83	49.97	10:28
2	TOC	5.5398	55.3975	44.61	48.20	3.60	49.98	10:25

Dilution	Blank Contribution	Method	Calibration

1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	60	TOC	K2000833-008.01 doc	5.1761 ppm	0.0158 ppm	0.3000%	2020/02/01 03:14

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	5.1649	51.6492	42.24	45.87	3.64	49.98	10:29
2	TOC	5.1872	51.8722	42.38	46.16	3.78	50.01	10:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	61	TOC	K2000833-009.01 doc	5.3191 ppm	0.0040 ppm	0.0800%	2020/02/01 03:42

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	5.3163	53.1628	43.19	46.92	3.72	50.00	10:29
2	TOC	5.3220	53.2197	43.23	47.18	3.95	50.03	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	62	TOC	K2000833-010.01 doc	3.3628 ppm	0.0643 ppm	1.9100%	2020/02/01 04:10

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.3173	33.1733	30.55	34.29	3.73	50.02	10:27
2	TOC	3.4083	34.0827	31.13	34.93	3.80	50.02	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	63	TOC	K2000833-011.01 doc	5.0911 ppm	0.0287 ppm	0.5600%	2020/02/01 04:38

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	5.1115	51.1146	41.90	45.56	3.66	50.04	10:31
2	TOC	5.0708	50.7082	41.64	45.21	3.57	50.06	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	64	TOC	K2000833-012.01 doc	3.9145 ppm	0.0510 ppm	1.3000%	2020/02/01 05:06

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.9506	39.5059	34.56	38.34	3.78	50.04	10:28
2	TOC	3.8785	38.7847	34.10	37.96	3.85	50.04	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	65	TOC	K2000833-001.01 doc	0.5269 ppm	0.0084 ppm	1.5900%	2020/02/01 05:34

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.5210	5.2095	12.87	16.63	3.76	50.09	10:32
2	TOC	0.5328	5.3282	12.95	16.72	3.77	50.03	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	66	TOC	K2000866-001.01 ms doc	28.0039 ppm	0.0000 ppm	0.0000%	2020/02/01 06:02

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	28.0039	280.0391	186.64	190.39	3.75	50.07	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	24.2094 ppm (PASS)	0.0000 ppm	0%	2020/02/01 06:17

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.2094	242.0942	163.27	167.17	3.90	50.03	10:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)	50 ppmC

Sample Type: Check Standard --> CCB From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:1	[TOC] CCB [0	0 / infinity	0.0000	0.0000	0%	2020/02/01 06:31

					ppm]	(NA / NA)	ppm (PASS)	ppm		

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	7.34	11.10	3.76	50.07	10:33

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)	0 ppmC

Sample Type: Sample From Schedule Version 5

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	67	TOC	K2000866-002.01 doc	1.4433 ppm	0.0081 ppm	0.5600%	2020/02/01 06:46

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.4490	14.4902	18.74	22.67	3.93	50.04	10:28
2	TOC	1.4376	14.3763	18.67	22.59	3.92	50.05	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	68	TOC	K2000866-003.01 doc	1.3272 ppm	0.0025 ppm	0.1900%	2020/02/01 07:15

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.3290	13.2898	17.98	22.05	4.06	50.03	10:29
2	TOC	1.3255	13.2550	17.96	21.75	3.79	50.06	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	69	TOC	K2000866-004.01 doc	1.4099 ppm	0.0064 ppm	0.4500%	2020/02/01 07:43

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.4144	14.1438	18.52	22.40	3.88	50.03	10:29
2	TOC	1.4054	14.0537	18.46	22.40	3.93	50.03	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	70	TOC	K2000866-005.01 doc	0.9858 ppm	0.0174 ppm	1.7700%	2020/02/01 08:11

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

#	Analysis Type			(Abs)		(Abs)	(psig)	Time
1	TOC	0.9981	9.9811	15.89	19.67	3.78	50.04	10:25
2	TOC	0.9734	9.7344	15.73	19.66	3.92	50.02	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	71	TOC	K2000866-006.01 doc	0.7543 ppm	0.0102 ppm	1.3500%	2020/02/01 08:39

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.7615	7.6151	14.39	18.11	3.72	50.04	10:29
2	TOC	0.7471	7.4712	14.30	18.09	3.79	50.06	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	72	TOC	K2000866-007.01 doc	0.5100 ppm	0.0117 ppm	2.3000%	2020/02/01 09:07

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.5183	5.1826	12.86	16.76	3.91	50.03	10:27
2	TOC	0.5017	5.0166	12.75	16.72	3.97	50.07	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	73	TOC	K2000866-008.01 doc	0.9984 ppm	0.0362 ppm	3.6300%	2020/02/01 09:35

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.0241	10.2405	16.05	19.93	3.87	50.04	10:26
2	TOC	0.9728	9.7281	15.73	19.56	3.83	50.06	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	74	TOC	K2000866-009.01 doc	0.8757 ppm	0.0615 ppm	7.0200%	2020/02/01 10:03

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.9192	9.1919	15.39	19.12	3.72	50.06	10:28
2	TOC	0.8322	8.3221	14.84	18.61	3.77	50.05	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.39	10.03	3.64	50.06	10:32

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5791 (IC) (v1345)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	24.0948 ppm (PASS)	0.0000 ppm	0%	2020/02/01 10:46

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.0948	240.9475	162.55	166.16	3.61	50.03	10:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)	50 ppmC

Sample Type: Check Standard --> CCB From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2020/02/01 11:01

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	6.83	10.49	3.67	50.05	10:33

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)	0 ppmC

Meta Data Used in this Report

Blanks

Version	Reagent	Acid	DI IC	DI TC	DI TOC	Save Time	Operator

	(Abs)	(Abs)	(Abs)	(Abs)	(Abs)		
v1344	2.1923	1.5750	0.0000	0.0000	0.0000	2020/01/30 14:00	Fusion1 (Fusion1)
v1345	1.9953	1.4740	0.0000	0.0000	0.0000	2020/01/30 22:05	Fusion1 (Fusion1)

Calibrations

Name: CAS_salt_010711 (TOC)

Version: v31
Ver Creation: 2020/01/07 14:30
Comment:
Operator: Fusion1 (Fusion1)
Basic Analysis Type: TOC
Calibration curve formula: TOC: y = 6.323x + 10.200
r^2 value: TOC: r^2 = 0.99991

Basic Analysis Type: TOC

Sample ID	Y Raw Value	X Expected	Message	End Time
DI Water	9.5850	0.0000		2020/01/07 13:02
0.500 ppm	12.6160	0.5000		2020/01/07 13:17
1.0 ppm	15.6440	1.0000		2020/01/07 13:31
5.0 ppm	43.7700	5.0000		2020/01/07 13:45
10 ppm	73.2770	10.0000		2020/01/07 14:00
25 ppm	169.4210	25.0000		2020/01/07 14:14
50 ppm	325.6260	50.0000		2020/01/07 14:28

Methods

Name: CAS_salt_010711 (TOC)

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

Parameter	Value
SampleVolume	10.0 mL
Dilution	1:10
AcidVolume	0.5 ml
ReagentVolume	2.0 ml
UVReactorPrerinse	Off
UVReactorPrerinseVolume	5.0
NumberOfUVReactorPrerinses	1
ICSpargeTime	1.00 mins
DetectorSweepFlow	500 ml/min
PreSpargeTime	2.00 mins
SystemFlow	500 ml/min

Advanced Parameter	Value
NeedleRinseVolume	5.0 ml
VialPrimeVolume	2.0 ml
ICSamplePrimeVolume	2.0 ml
ICSpargeRinseVolume	12.0 ml
BaselineStabilizeTime	0.70 min
DetectorPressureFlow	150 ml/min
SyringeSpeedWaste	10
SyringeSpeedAcid	7
SyringeSpeedReagent	7
SyringeSpeedDIWater	7
NDIRPressurization	60 psig
SyringeSpeedSampleDispense	5
SyringeSpeedSampleAspirate	4
SyringeSpeedUVDispense	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	2020/02/01 11:16

ALS Environmental

StarLIMS Run: 668439, 668440, 668441, 668442

Analysis: DOC/TOC

Method: SM 5310 C, 9060A, 415.1, 9060

CCV: 11-GEN-05-82C 50 ppm LCS: 11-GEN-05-79J 25.0 ppm

ICAL Date: 1/7/2020

ICAL ID: 11-GEN-05-83-K->O/84-A/11-GEN-05-84-C->H

ICS ID: 11-GEN-05-78M

ICS TV: 25.0 ppm ICS % R < 1

Spike ID: 11-GEN-05-82C 0.05 ml of 5000 ppm stock ---> 10.0 ml = 25.0 ppm x dilution factor

Sodium Persulfate: 19-GEN-08-2-M

21 % H3PO4: 19-GEN-08-2-L

Equipment ID: K-TOC-03

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

FILTER ID: 16967789

Analyzed By: KCS	Date Analyzed: 2/1/20
Reviewed By:	Date Reviewed: 02/04/20

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

February 19, 2020

Marcia Olive
Bhate Environmental Associates, Inc.
445 Union Blvd Ste 129
Lakewood, CO 80228

Work Order: **HS20011311**

Laboratory Results for: **Longhorn GW Treatment Plant Weekly Samples**

Dear Marcia,

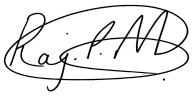
ALS Environmental received 2 sample(s) on Jan 29, 2020 for the analysis presented in the following report.

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: 19-Feb-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Weekly Samples
Work Order: HS20011311

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS20011311-01	LH18/24-SP650_012820	Water		28-Jan-2020 14:00	29-Jan-2020 08:26	☐
HS20011311-02	LH18/24-SP650_012820_BIX	Water		28-Jan-2020 14:00	29-Jan-2020 08:26	☐

ALS Houston, US Date: 19-Feb-20

Client: Bhate Environmental Associates, Inc. **CASE NARRATIVE**
Project: Longhorn GW Treatment Plant Weekly Samples
Work Order: HS20011311

Work Order Comments

- The analysis for Perchlorate were subcontracted to ALS High Res Lab Houston, TX. Final report attached.

  The analysis for TOC was subcontracted to ALS Kelso, WA. Final report attached.

WetChemistry by Method E350.3

Batch ID: R355627

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

WetChemistry by Method E365.3

Batch ID: R355430

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

ALS Houston, US Date: 19-Feb-20

Client: Bhate Environmental Associates, Inc.
ANALYTICAL REPORT
Project: Longhorn GW Treatment Plant Weekly Samples
WorkOrder:HS20011311
Sample ID: LH18/24-SP650_012820
Lab ID:HS20011311-01
Collection Date: 28-Jan-2020 14:00
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
AMMONIA AS N BY E350.3(ISE)		**Method:E350.3**						Analyst: RG
Nitrogen, Ammonia (As N)	**0.21**	a	**0.20**	**0.10**	**0.20**	**mg/L**	1	04-Feb-2020 10:45
ORTHO PHOSPHATE (PO4) AS P BY E365.3		**Method:E365.3**						Analyst: MZD
Phosphorus, Total Orthophosphate (As P)	0.0250	aU	0.0100	0.0250	0.0250	mg/L	1	30-Jan-2020 12:20
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	05-Feb-2020 15:19

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

ALS Houston, US Date: 19-Feb-20

Client: Bhate Environmental Associates, Inc.
ANALYTICAL REPORT
Project: Longhorn GW Treatment Plant Weekly Samples
WorkOrder:HS20011311
Sample ID: LH18/24-SP650_012820_BIX
Lab ID:HS20011311-02
Collection Date: 28-Jan-2020 14:00
Matrix:Water

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	0	NA	1	19-Feb-2020 09:33

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

ALS Houston, US Date: 19-Feb-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Weekly Samples
WorkOrder: HS20011311

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R355430 (0)	**Test Name :** ORTHO PHOSPHATE (PO4) AS P BY E365.3				**Matrix:** Water	
HS20011311-01	LH18/24-SP650_012820	28 Jan 2020 14:00			30 Jan 2020 12:20	1
Batch ID: R355627 (0)	**Test Name :** AMMONIA AS N BY E350.3(ISE)				**Matrix:** Water	
HS20011311-01	LH18/24-SP650_012820	28 Jan 2020 14:00			04 Feb 2020 10:45	1
Batch ID: R355729 (0)	**Test Name :** SUBCONTRACT ANALYSIS - TOC ANALYSIS				**Matrix:** Water	
HS20011311-01	LH18/24-SP650_012820	28 Jan 2020 14:00			05 Feb 2020 15:19	1
Batch ID: R356527 (0)	**Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)				**Matrix:** Water	
HS20011311-02	LH18/24-SP650_012820_BIX	28 Jan 2020 14:00			19 Feb 2020 09:33	1

ALS Houston, US Date: 19-Feb-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Weekly Samples
WorkOrder: HS20011311

QC BATCH REPORT

Batch ID: R355430 (0) **Instrument:** UV-2450 **Method:** ORTHO PHOSPHATE (PO4) AS P BY E365.3

MBLK Sample ID: **MBLK-R355430** Units: **mg/L** Analysis Date: **30-Jan-2020 12:20**
Client ID: Run ID: **UV-2450_355430** SeqNo: **5455003** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total Orthophosphate (As P)	0.0250	0.0250								U

LCS Sample ID: **LCS-R355430** Units: **mg/L** Analysis Date: **30-Jan-2020 12:20**
Client ID: Run ID: **UV-2450_355430** SeqNo: **5455002** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total Orthophosphate (As P)	0.221	0.0250	0.25	0	88.4	85 - 115				

MS Sample ID: **HS20011311-01MS** Units: **mg/L** Analysis Date: **30-Jan-2020 12:20**
Client ID: **LH18/24-SP650_012820** Run ID: **UV-2450_355430** SeqNo: **5455005** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total Orthophosphate (As P)	0.223	0.0250	0.25	0.004	87.6	80 - 120				

MSD Sample ID: **HS20011311-01MSD** Units: **mg/L** Analysis Date: **30-Jan-2020 12:20**
Client ID: **LH18/24-SP650_012820** Run ID: **UV-2450_355430** SeqNo: **5455004** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total Orthophosphate (As P)	0.23	0.0250	0.25	0.004	90.4	80 - 120	0.223	3.09	20	

The following samples were analyzed in this batch: HS20011311-01

ALS Houston, US Date: 19-Feb-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Weekly Samples
WorkOrder: HS20011311

QC BATCH REPORT

Batch ID: R355627 (0) **Instrument: WetChem_HS** **Method: AMMONIA AS N BY E350.3(ISE)**

MBLK Sample ID: **MBLK-R355627** Units: **mg/L** Analysis Date: **04-Feb-2020 10:45**
Client ID: Run ID: **WetChem_HS_355627** SeqNo: **5458923** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Ammonia (As N)	0.10	0.20								U

LCS Sample ID: **LCS-R355627** Units: **mg/L** Analysis Date: **04-Feb-2020 10:45**
Client ID: Run ID: **WetChem_HS_355627** SeqNo: **5458922** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Ammonia (As N)	10.45	0.20	10	0	104	80 - 120				

MS Sample ID: **HS20011280-01MS** Units: **mg/L** Analysis Date: **04-Feb-2020 10:45**
Client ID: Run ID: **WetChem_HS_355627** SeqNo: **5458925** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Ammonia (As N)	10.74	0.20	10	0.387	103	80 - 120				

MSD Sample ID: **HS20011280-01MSD** Units: **mg/L** Analysis Date: **04-Feb-2020 10:45**
Client ID: Run ID: **WetChem_HS_355627** SeqNo: **5458924** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Ammonia (As N)	10.69	0.20	10	0.387	103	80 - 120	10.74	0.457	20	

The following samples were analyzed in this batch: HS20011311-01

ALS Houston, US Date: 19-Feb-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Weekly Samples
WorkOrder: **HS20011311**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	19-028-0	27-Mar-2020
California	2919, 2019-2020	30-Apr-2020
Dept of Defense	ANAB L2231 V009	22-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	624-2020	31-Dec-2020
North Dakota	R-193 2019-2020	30-Apr-2020
Oklahoma	2019-067	31-Aug-2020
Texas	T104704231-19-25	30-Apr-2020

ALS Houston, US Date: 19-Feb-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Weekly Samples
Work Order: HS20011311

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS20011311-01	LH18/24-SP650_012820	Login	1/29/2020 10:02:09 AM	PMG	WET119
HS20011311-01	LH18/24-SP650_012820	Login	1/29/2020 10:02:09 AM	PMG	WET119
HS20011311-01	LH18/24-SP650_012820	Login	1/29/2020 10:02:09 AM	PMG	Sub
HS20011311-02	LH18/24-SP650_012820_BIX	Login	1/29/2020 10:02:09 AM	PMG	Sub

ALS Houston, US Date: 19-Feb-20

Sample Receipt Checklist

Client Name: Bhate Environmental
Work Order: HS20011311
Date/Time Received: **29-Jan-2020 08:26**
Received by: **AC**

Checklist completed by: *Paresh M. Giga* eSignature 29-Jan-2020 Date
Reviewed by: *RJ Modashia* eSignature 29-Jan-2020 Date

Matrices: **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):	1.6c U/C	IR25	
Cooler(s)/Kit(s):	44847		
Date/Time sample(s) sent to storage:	1/29/2020 10:35		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

CHAIN OF CUSTODY

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

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

Project No. NWO1312.0150.0 16.0001

Job: **GROUNDWATER TREATMENT PLANT WEEKLY SAMPLES**

Prepared By: Scott Beesinger

P.O. Number

HS20011311
Bhate Environmental Associates. Inc.
Longhorn GW Treatment Plant Weekly Samples

Field Sample I.D.	Sample Matrix	Date / Time	MS / MSD	No. OF CONTAINERS	Analyses: AMMONIA-N	TOTAL ORGANIC CARBON	ORTHO-PHOSPHATE	PERCHLORATE	Remarks (Preservatives, etc.)	Lab I.D.#
LH18/24-SP650_012820	Water	01/28/20 / 14:00		3	X	X			H2SO4	
LH18/24-SP650_012820	Water	01/28/20 / 14:00		1			X		NONE	
LH18/24–SP650_012820_BIX	Water	01/28/20 / 14:00		1				X	NONE	

Additional Remarks: **Standard TAT on all parameters**

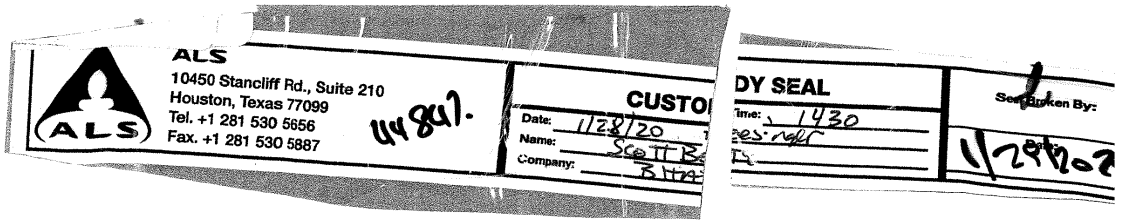
Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
Scott Beesinger	01/28/20	14:30									

For Lab Use Only

Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition
AC	1/29/2020	08:26							

Remarks: o/c 1.6 IR #25 COC 44847

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



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

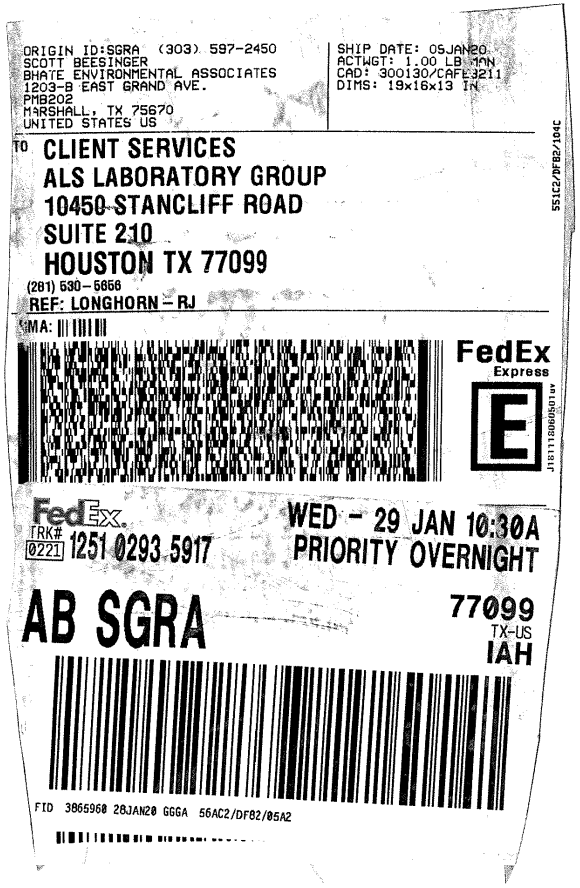
44847.

CUSTO
Date: 1/28/20
Name: Scott B
Company: B

DY SEAL
Time: 1430

Seal Broken By:

1/29/20



ORIGIN ID:SGRA (303) 597-2450
SCOTT BEESINGER
BHATE ENVIRONMENTAL ASSOCIATES
1203-B EAST GRAND AVE.
PMB202
MARSHALL, TX 75670
UNITED STATES US

SHIP DATE: 05JAN20
ACTWGT: 1.00 LB MAN
CAD: 3001307CAFE3211
DIMS: 19x16x13 IN

TO CLIENT SERVICES
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON TX 77099
(281) 530-5656
REF: LONGHORN - RJ

INV:
PO:
DEPT:

FedEx Express

FedEx
TRK# 0221 1251 0293 5917

WED - 29 JAN 10:30A
PRIORITY OVERNIGHT

AB SGRA

77099
TX-US
IAH

FID 3865960 28JAN20 GGGA 56AC2/DF82/05A2

551C2/DF82/104C

February 18, 2020 Service Request No:E2000076

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

Laboratory Results for: HS20011311

Dear RJ,

Enclosed are the results of the sample(s) submitted to our laboratory January 29, 2020
For your reference, these analyses have been assigned our service request number **E2000076.**

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current TNI standards, where applicable, and except as noted in the laboratory case narrative provided. All results are intended to be considered in their entirety and ALS Environmental is not responsible for use of less than the complete final report. Results apply only to the items submitted to the laboratory, as received for analysis. In accordance with the current TNI Standard, a statement on the estimated uncertainty of measurement of any quantitative analysis will be supplied upon request.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Corey Grandits
Project Manager

ADDRESS 10450 Stancliff Rd., Suite 210, Houston, TX 77099
PHONE +1 281 530 5656 | FAX +1 281 530 5887
ALS Group USA, Corp.
dba ALS Environmental

Certificate of Analysis

ALS Environmental - Houston HRMS
10450 Stancliff Rd, Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

ALS Environmental

Client:	ALS Houston	**Service Request No.:**	E2000076
Project:	HS20011311	**Date Received:**	01/29/20
Sample Matrix:	W		

CASE NARRATIVE

All analyses were performed in adherence to the quality assurance program of ALS Environmental. This report contains analytical results for samples designated for Tier IV. When appropriate to the method, method blank results have been reported with each analytical test.

Sample Receipt

One sample was received for analysis at ALS Environmental in Houston on 01/29/20.

The sample was received in good condition and is consistent with the accompanying chain of custody form. The sample was stored in a refrigerator at 4°C upon receipt at the laboratory.

Data Validation Notes and Discussion

Precision and Accuracy:

EQ2000051: Laboratory Control Spike/Duplicate Laboratory Control Spike (LCS/DLCS) samples were analyzed and reported in lieu of a MS/MSD for this extraction batch. The LCS and DLCS recoveries are within QC limits.

The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and ALS Environmental (ALS) is not responsible for utilization of less than the complete report.

Use of ALS group USA Corp dba ALS Environmental (ALS)'s Name. Client shall not use ALS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to ALS any test result, tolerance or specification derived from ALS's data ("Attribution") without ALS's prior written consent, which may be withheld by ALS for any reason in its sole discretion. To request ALS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If ALS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use ALS's name or trademark in any Materials or Attribution shall be deemed denied. ALS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of ALS's name or trademark may cause ALS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.

Client: ALS Environmental - US **Service Request:**E2000076
Project: HS20011311

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
E2000076-001	LH18/24-SP650_12820_BIX	1/28/2020	1400

Service Request Summary

Folder #: **E2000076**
Client Name: ALS Environmental - US
Project Name: HS20011311
Project Number:

Report To: RJ Modashia
ALS Laboratory Group
10450 Stancliff Road
Houston, TX 77099-4338
USA
Phone Number: 281-530-5656
Cell Number:
Fax Number: 281-530-5887
E-mail: rj.modashia@alsglobal.com

Project Chemist: Corey Grandits
Originating Lab: HOUSTON
Logged By: CGRANDITS
Date Received: 01/29/20
Internal Due Date: 2/12/2020
QAP: LAB QAP
Qualifier Set: Lab Standard
Formset: Lab Standard
Merged?: Y
Report to MDL?: Y
P.O. Number: HS20011311
EDD: No EDD Specified

1 250 mL-Plastic Bottle HDPE WM CLEAR Unpreserved
Location: EHRMS-WIC 5E
Pressure Gas:

Lab Samp No.	Client Samp No	Matrix	Collected	HOUSTON ClO4 DOD/6850
E2000076-001	LH18/24-SP650_12820_BIX	Water	01/28/20 1400	**IV**

Service Request Summary

Folder #:	**E2000076**
Client Name:	ALS Environmental - US
Project Name:	HS20011311
Project Number:	

Report To:	RJ Modashia ALS Laboratory Group 10450 Stancliff Road Houston, TX 77099-4338 USA
Phone Number:	281-530-5656
Cell Number:	
Fax Number:	281-530-5887
E-mail:	rj.modashia@alsglobal.com

Project Chemist:	Corey Grandits
Originating Lab:	HOUSTON
Logged By:	CGRANDITS
Date Received:	01/29/20
Internal Due Date:	2/12/2020
QAP:	LAB QAP
Qualifier Set:	Lab Standard
Formset:	Lab Standard
Merged?:	Y
Report to MDL?:	Y
P.O. Number:	HS20011311
EDD:	No EDD Specified

1 250 mL-Plastic Bottle HDPE WM CLEAR Unpreserved

Location: EHRMS-WIC 5E

Pressure Gas:

Data Qualifiers

Lab Standard

+	Possible Tedlar bag artifact.
A	TIC is a suspected aldol-condensation product
B	Analyte found in the associated method blank as well as in the sample.
BC	Reported results are not blank corrected.
BH	The back section of the tube yielded higher results than the front.
BT	Results indicated possible breakthrough; back section >=10% front section.
C	Result identification confirmed.
D	Compound identified in an analysis at a secondary dilution factor
D	Spike was diluted out
DE	Reported results are corrected for desorption efficiency.
E	Estimated value. Concentration above calibration range
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
H1	Sample analysis performed past holding time. See case narrative.
H2	Initial analysis within holding time. Reanalysis for the required dilution was past holding time.
H3	Sample was received and analyzed past holding time.
H4	Sample was extracted past required extraction holding time, but analyzed within analysis holding time. See case narrative.
I	Internal standard not within the specified limits. See case narrative.
J	Estimated Value. Concentration found below MRL.
K	A deflection in the QC ion may indicate interference with the quantitation of this ion. The concentration of this analyte should be considered as an estimate.
K	Analyte was detected above the method reporting limit prior to normalization.
L1	Laboratory control sample recovery outside the specified limits; results may be biased high.
L2	Laboratory control sample recovery outside the specified limits; results may be biased low.
L3	Laboratory control sample recovery outside the specified limits.
M	Matrix interference; results may be biased high.
M	The duplicate injection precision not met.
M1	Matrix interference due to coelution with a non-target compound; results may be biased high.
N	Presumptive evidence of a compound for TICs that have been identified based on a mass spectral library search.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.
P	Indicates chlorodiphenyl ether interference present at the retention time of the target compound.
P	Pesticide/Aroclor target analyte > 40% difference for detected concentrations between GC columns
Q	Indicates as estimated value because the P and P + 2 theoretical abundance ratio does not meet method criteria.
R	Duplicate Precision not met.
R1	Duplicate precision not within the specified limits; however, the results are below the MRL and considered estimated.
S	Surrogate recovery not within specified limits.

Data Qualifiers

Lab Standard

S	The reported value was determined by the Method of Standard Additions (MSA).
T	Analyte is a tentatively identified compound, result is estimated.
U	Compound was analyzed for, but was not detected (ND).
V1	The continuing calibration verification standard was outside (biased high) the specified limits for this compound.
V2	The continuing calibration verification standard was outside (biased low) the specified limits for this compound.
W	Result quantified, but the corresponding peak was detected outside the generated retention time window.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
X	See case narrative.
Y	Recovery outside limits
Y	The chromatogram resembles a petroleum product but does not match the calibration standard.
Z	The chromatogram does not resemble a petroleum product.
i	The MRL/MDL has been elevated due to a matrix interference.

ALS Laboratory Group

Acronyms

Cal	Calibration
Conc	CONCentration
Dioxin(s)	Polychlorinated dibenzo-p-dioxin(s)
EDL	Estimated Detection Limit
EMPC	Estimated Maximum Possible Concentration
Flags	Data qualifiers
Furan(s)	Polychlorinated dibenzofuran(s)
g	Grams
ICAL	Initial CALibration
ID	IDentifier
Ions	Masses monitored for the analyte during data acquisition
L	Liter (s)
LCS	Laboratory Control Sample
DLCS	Duplicate Laboratory Control Sample
MB	Method Blank
MCL	Method Calibration Limit
MDL	Method Detection Limit
mL	Milliliters
MS	Matrix Spiked sample
DMS	Duplicate Matrix Spiked sample
NO	Number of peaks meeting all identification criteria
PCDD(s)	Polychlorinated dibenzo-p-dioxin(s)
PCDF(s)	Polychlorinated dibenzofuran(s)
ppb	Parts per billion
ppm	Parts per million
ppq	Parts per quadrillion
ppt	Parts per trillion
QA	Quality Assurance
QC	Quality Control
Ratio	Ratio of areas from monitored ions for an analyte
% Rec.	Percent recovery
RPD	Relative Percent Difference
RRF	Relative Response Factor
RT	Retention Time
SDG	Sample Delivery Group
S/N	Signal-to-noise ratio
TEF	Toxicity Equivalence Factor
TEQ	Toxicity Equivalence Quotient

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ALS Environmental

State Certifications, Accreditations, and Licenses

Agency	Number	Expire Date
Arizona Department of Health Services	AZ0793	5/27/2020
Arkansas Department of Environmental Quality	19-028-0	3/27/2020
California Department of Health Services	2919	4/30/2020
Department of Defense	A2LA 2897.01	11/30/2021
Florida Department of Health	E87611	6/30/2020
Hawaii Department of Health	TX02694	4/30/2020
Illinois Environmental Protection Agency	2000322019-2	5/9/2020
Kansas Department of Health and Environment	E-10352	7/31/2020
Louisiana Department of Environmental Quality	03087	6/30/2020
Louisiana Department of Health and Hospitals	LA028-2020	12/31/2020
Maine Center for Disease Control and Prevention	201815	6/5/2020
Maryland Department of the Environment	343	6/30/2020
Minnesota Department of Health	1785988	12/31/2020
Nebraska Department of Health and Human Services	NE-OS-25-13	4/30/2020
Nevada Department of Concervation and Natural Resources	TX026932019-1	7/31/2020
New Hampshire Environmental Laboratory Accreditation Program	209419	4/24/2020
New Jersey Department of Environmental Protection	NLC190001	6/30/2020
New York Department of Health	11707	3/31/2020
Oklahoma Department of Environmental Quality	2019-067	8/31/2020
Pennsylvania Department of Environmental Protection	68-03441-013	6/30/2020
Tennessee Department of Environment and Concervation	04016	6/30/2020
Texas Commision on Environmental Quality	TX104704231-19-25	4/30/2020
United States Department of Agriculture	P330-19-00299	10/10/2022
Utah Department of Health Environmental Laboratory Certification	TX026932019-9	7/31/2020
Washington Department of Health	C819	11/14/2020
West Virginia Department of Environmental Protection	347	6/30/2020

Chain of Custody

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ALS Laboratory Group
HS20011311

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Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID:** **13218**

SUBCONTRACT TO:

ALS Environmental
10450 Stancliff RoadSuite 210
Houston, TX 77084

Phone: +1 281 530 5656

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:	HS20011311
TSR:	Danielle Winnings

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS20011311-02**	**LH18/24-SP650_012820_BIX**	**Water**	**28 Jan 2020 14:00**
	SUB_Perch-6850			06 Feb 2020

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: 1/29/2020 12:55

Received By: _____ Date/Time: 1/29/20 12:55

Cooler ID(s): _____ Temperature(s): _____

ALS Environmental

Cooler Receipt Form

Project Chemist CH

Client/Project ALS-H

Thermometer ID SM04

Date/Time Received: 1-29-20 Initials: CH

Date/Time Logged in: 1-29-20 Initials CH

1. Method of delivery: ○ US Mail ~~○ Fed Ex~~ ○ UPS ○ DHL ○ Courier (ALS) ○ Client

2. Samples received in: ○ Cooler ○ Box ○ Envelope ○ Other

3. Were custody seals on coolers? ○ Yes ○ No

Were they intact? ○ Yes ○ No ○ N/A

Were they signed and dated? ○ Yes ○ No ○ N/A

If yes, how many and where?

4. Packing Material: ○ Inserts ○ Baggies ○ Bubble Wrap ○ Gel Packs ○ Wet Ice ○ Sleeves ○ Other

5. Foreign or Regulated Soil? ○ Yes ○ No Location of Sampling:

Cooler Tracking Number	COC ID	Date Opened	Time Opened	Opened By	Temp. °C	Temp Blank?
–		1/29/20	1300	CH	1.2/1.6	☒
						☐
						☐
						☐

6. Were custody papers properly filled out (ink, signed, dated, etc)? ○ Yes ○ No

7. Did all bottles arrive in good condition (not broken, no signs of leakage)? ○ Yes ○ No

8. Were all sample labels complete (i.e., sample ID, analysis, preservation, etc)? ○ Yes ○ No

9. Were appropriate bottles/containers and volumes received for the requested tests? ○ Yes ○ No

10. Did sample labels and tags agree with custody documents? ○ Yes ○ No

Notes, Discrepancies, & Resolutions:

Service request Label:

E2000076 5
ALS Laboratory Group
HS20011311

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SAMPLE ACCEPTANCE POLICY

This policy outlines the criteria samples must meet to be accepted by ALS Environmental – Houston HRMS.

Cooler Custody Seals (desirable, mandatory if specified in SAP):

- ✓ Intact on outside of cooler, signed and dated

Chain-of-Custody (COC) documentation (mandatory):

The following is required on each COC:

- ✓ Sample ID, the location, date and time of collection, collector's name, preservation type, sample type, and any other special remarks concerning the sampleThe COC must be completed in ink.
- ✓ Signature and date of relinquishing party.

In the absence of a COC at sample receipt, the COC will be requested from the client.

Sample Integrity (mandatory):

Samples are inspected upon arrival to ensure that sample integrity was not compromised during transfer to the laboratory.

- ✓ Sample containers must arrive in good condition (not broken or leaking).
- ✓ Samples must be labeled appropriately, including Sample IDs, and requested test using durable labels and indelible ink.
- ✓ The correct type of sample bottle must be used for the method requested.
- ✓ An appropriate sample volume, or weight, must be received.
- ✓ Sample IDs and number of containers must reconcile with the COC.
- ✓ Samples must be received within the method defined holding time.

Temperature Requirement (varies by sample matrix):

- ✓ Aqueous and Non-aqueous samples must be shipped and stored cold, at 0 to 6ºC.
- ✓ Tissue samples must be shipped and stored frozen, at -20 to -10ºC.
- ✓ Air samples are shipped and stored cold, at 0 to 6ºC
- ✓ The sample temperature must be recorded on the COC

All cooler inspections are documented on the Cooler Receipt Form (CRF). A separate CRF is completed for each service request. Any samples not meeting the above criteria are noted on the CRF and the Project Manager notified. The Project Manager must resolve any sample integrity issues with the client prior to proceeding with the analysis. Such resolutions are documented in writing and filed with the project folder. Data associated with samples received outside of this acceptance policy will be qualified on the case narrative of the final report

Preparation Information Benchsheets

ALS Environmental - Houston HRMS
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Preparation Information Benchsheet

Prep Run#: 353630 **Prep WorkFlow:** GenExt28Day **Status:** Prepped
Team: Semivoa GCMS/KBROWN **Prep Method:** Method **Prep Date/Time:** 2/11/20 13:46

#	Lab Code	Client ID	B#	Method /Test	pH	Cl	Matrix	Amt. Ext.	Sample Description
1	E2000074-001	LH18/24-SP650_12320_BIX	.01	6850/ClO4 DOD			Water	10mL	
2	E2000075-001	HBW7_012020	.01	6850/ClO4 DOD			Surface Water	10mL	
3	E2000075-002	HBW10_012020	.01	6850/ClO4 DOD			Surface Water	10mL	
4	E2000075-003	HBW1_012020	.01	6850/ClO4 DOD			Surface Water	10mL	
5	E2000075-004	GPW1_012020	.01	6850/ClO4 DOD			Surface Water	10mL	
6	E2000075-005	GPW1_012020_a	.01	6850/ClO4 DOD			Surface Water	10mL	
7	E2000075-006	GPW3_012020	.01	6850/ClO4 DOD			Surface Water	10mL	
8	E2000076-001	LH18/24-SP650_12820_BIX	.01	6850/ClO4 DOD			Water	10mL	
9	E2000087-001	GW-MW-85-20200129-01	.01	6850/ClO4			Water	10mL	
10	E2000087-002	GW-MW-84-20200129-01	.01	6850/ClO4			Water	10mL	
11	E2000087-003	EB-001-20200129-01	.01	6850/ClO4			Water	10mL	
12	E2000092-001	LH18/24-SP650_020420_BIX	.01	6850/ClO4 DOD			Water	10mL	
13	EQ2000051-01	MB		6850/ClO4 DOD			Liquid	10mL	
14	EQ2000051-02	LCS		6850/ClO4 DOD			Liquid	10mL	
15	EQ2000051-03	DLCS		6850/ClO4 DOD			Liquid	10mL	

Spiking Solutions

Name: Sodium Perchlorate 1 ug/mL (IS) (18-O) as CLO4 Inventory ID 202037 Logbook Ref: Sodium Perchlorate Expires On: 05/22/2021

E2000074-001	100.00µL	E2000075-001	100.00µL	E2000075-002	100.00µL	E2000075-003	100.00µL	E2000075-004	100.00µL	E2000075-005	100.00µL
E2000075-006	100.00µL	E2000076-001	100.00µL	E2000087-001	100.00µL	E2000087-002	100.00µL	E2000087-003	100.00µL	E2000092-001	100.00µL
EQ2000051-01	100.00µL	EQ2000051-01	100.00µL	EQ2000051-02	0.10µL	EQ2000051-02	0.10µL	EQ2000051-03	0.10µL	EQ2000051-03	0.10µL

Name: Perchlorate Intermediate Stock1 Inventory ID 204799 Logbook Ref: 200657 1.0ug/mL KN Expires On: 05/15/2020

EQ2000051-02	10.00µL	EQ2000051-02	10.00µL	EQ2000051-03	10.00µL	EQ2000051-03	10.00µL

Preparation Steps

Step: Preparation
Started: 2/11/20 13:46
Finished: 2/11/20 15:00
By: KBROWN
Comments

Comments:

Preparation Information Benchsheet

Prep Run#: 353630
Team: Semivoa GCMS/KBROWN

Prep WorkFlow: GenExt28Day
Prep Method: Method

Status: Prepped
Prep Date/Time: 2/11/20 13:46

Reviewed By: KB Date: 02/12/2020

Chain of Custody

Relinquished By: _____ Date: _____

Received By: _____ Date: _____

Extracts Examined
Yes No

Analytical Results

ALS Environmental - Houston HRMS
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ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2000076
Project:	HS20011311	**Date Collected:**	1/28/20 1400
Sample Matrix:	Water	**Date Received:**	1/29/20
Sample Name:	LH18/24-SP650_12820_BIX	**Units:**	µg/L
Lab Code:	E2000076-001	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.322**		0.100	0.0500	0.0250	1	2/11/20	2/17/20 14:54	353630	670318	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2000076
Project:	HS20011311	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	µg/L
Lab Code:	EQ2000051-01	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0500	0.0250	1	2/11/20	2/17/20 11:42	353630	670318	

Accuracy & Precision

ALS Environmental - Houston HRMS
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ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: HS20011311
Sample Matrix: Water

Service Request: E2000076
Date Analyzed: 2/17/20

Lab Control Sample Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Units: µg/L
Basis: NA

Extraction Lot: 353630

	Lab Control Sample EQ2000051-02			Duplicate Lab Control Sample EQ2000051-03					
Analyte Name	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Perchlorate	0.855	1.00	86	0.842	1.00	84	84 - 119	2	15

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

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

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2000076
Project:	HS20011311	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Lab Control Sample	**Units:**	µg/L
Lab Code:	EQ2000051-02	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.855**		0.100	0.0500	0.0250	1	2/11/20	2/17/20 14:15	353630	670318	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2000076
Project:	HS20011311	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Duplicate Lab Control Sample	**Units:**	µg/L
Lab Code:	EQ2000051-03	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.842**		0.100	0.0500	0.0250	1	2/11/20	2/17/20 16:15	353630	670318	

Initial Calibration

ALS Environmental - Houston HRMS
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www.alsglobal.com

20191230

1st Review: Kneir
2nd Review: Hvan

ALS Environmental
LCMS01 -Shimadzu 8050

ICAL Date: 12/30/2019
Cal. Std. xp: 5/14/2020
ICAL ID: **EC2000001**

Mobile Phases **A:** 0.75% Formic Acid/Water 3100803-09 **B:** MeOH 3100802-01

	Sample Name		File Name	Acquisition Method	Dilution	R	Comments	Date/Time
	null	null	20191230_001	Perchlorate6850b.lcm	1x	☒		12/30/2019 10:02
	null	null	20191230_002	Perchlorate6850b.lcm	1x	☒		12/30/2019 10:07
	DIBLK	DIBLK	20191230_003	Perchlorate6850b.lcm	1x	☒		12/30/2019 10:12
	DIBLK	DIBLK	20191230_004	Perchlorate6850b.lcm	1x	☒		12/30/2019 10:20
	IB	IB	20191230_005	Perchlorate6850b.lcm	1x	☒		12/30/2019 10:28
	PERCHLORATE7	PERCHLORATE7	20191230_006	Perchlorate6850b.lcm	1x	☒	3100805-02	12/30/2019 10:48
	PERCHLORATE1	PERCHLORATE1	20191230_007	Perchlorate6850b.lcm	1x	☒	3100804-05	12/30/2019 10:56
	PERCHLORATE2	PERCHLORATE2	20191230_008	Perchlorate6850b.lcm	1x	☒	3100804-06	12/30/2019 11:04
	PERCHLORATE3	PERCHLORATE3	20191230_009	Perchlorate6850b.lcm	1x	☒	3100804-07	12/30/2019 11:12
	PERCHLORATE4	PERCHLORATE4	20191230_010	Perchlorate6850b.lcm	1x	☒	3100804-08	12/30/2019 11:19
	PERCHLORATE5	PERCHLORATE5	20191230_011	Perchlorate6850b.lcm	1x	☒	3100804-09	12/30/2019 11:27
	PERCHLORATE6	PERCHLORATE6	20191230_012	Perchlorate6850b.lcm	1x	☒	3100805-01	12/30/2019 11:35
	PERCHLORATE8	PERCHLORATE8	20191230_013	Perchlorate6850b.lcm	1x	☒	3100805-03	12/30/2019 11:43
	PERCHLORATE9	PERCHLORATE9	20191230_014	Perchlorate6850b.lcm	1x	☒	3100805-04	12/30/2019 11:51
	PERCHLORATE10	PERCHLORATE10	20191230_015	Perchlorate6850b.lcm	1x	☒	3100805-05	12/30/2019 11:59
	ICV	ICV	20191230_016	Perchlorate6850b.lcm	1x	☒	3100805-06	12/30/2019 12:07
	EQ1900442-01	EQ1900442-01	20191230_017	Perchlorate6850b.lcm	1x	☒		12/30/2019 14:01
	EQ1900442-02	EQ1900442-02	20191230_018	Perchlorate6850b.lcm	1x	☒		12/30/2019 14:09
	EQ1900442-03	EQ1900442-03	20191230_019	Perchlorate6850b.lcm	1x	☒		12/30/2019 14:17
	EQ1900442-04	EQ1900442-04	20191230_020	Perchlorate6850b.lcm	1x	☒		12/30/2019 14:25
	EQ1900442-05	EQ1900442-05	20191230_021	Perchlorate6850b.lcm	1x	☒		12/30/2019 14:33
	E1900912-001	E1900912-001	20191230_022	Perchlorate6850b.lcm	1x	☒		12/30/2019 14:41
	E1900912-002	E1900912-002	20191230_023	Perchlorate6850b.lcm	1x	☒		12/30/2019 14:49
	CCV	CCV	20191230_024	Perchlorate6850b.lcm	1x	☒	3100805-02	12/30/2019 14:57
	E1900912-001X1000	E1900912-001X1000	20191230_025	Perchlorate6850b.lcm	1000	☒		12/30/2019 17:06
	E1900912-002X100	E1900912-002X100	20191230_026	Perchlorate6850b.lcm	100	☒		12/30/2019 17:14
	CCV	CCV	20191230_027	Perchlorate6850b.lcm	1x	☒	3100805-02	12/30/2019 17:22

Initial Calibration - Detailed Report

Calibration ID: EC2000001 **Instrument ID:** E-LCMS-01
Column Name: 1

#	Lab Code	Sample Name	File Location	Aquisition Date
07	EC2000001-07	PERCHLORATE7	20191230_006	12/30/2019 10:48
01	EC2000001-01	PERCHLORATE1	20191230_007	12/30/2019 10:56
02	EC2000001-02	PERCHLORATE2	20191230_008	12/30/2019 11:04
03	EC2000001-03	PERCHLORATE3	20191230_009	12/30/2019 11:12
04	EC2000001-04	PERCHLORATE4	20191230_010	12/30/2019 11:19
05	EC2000001-05	PERCHLORATE5	20191230_011	12/30/2019 11:27
06	EC2000001-06	PERCHLORATE6	20191230_012	12/30/2019 11:35
08	EC2000001-08	PERCHLORATE8	20191230_013	12/30/2019 11:43
09	EC2000001-09	PERCHLORATE9	20191230_014	12/30/2019 11:51
10	EC2000001-10	PERCHLORATE10	20191230_015	12/30/2019 11:59

Analyte **Curve Fit** **Weighting**

Perchlorate **Average RF** **RSD = 10.79** **Average RF = 0.1352**

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.1000	0.1736	02	0.5000	0.1222	03	0.7000	0.1219	04	1.0000	0.1363
05	2.0000	0.1337	06	5.0000	0.1268	07	10.0000	0.1373	08	20.0000	0.1349
09	30.0000	0.133	10	50.0000	0.1325						

Analyte

Perchlorate

#	Amount	Calculated Conc	%D	#	Amount	Calculated Conc	%D	#	Amount	Calculated Conc	%D
01	0.1000	0.128	28.4	02	0.5000	0.452	-9.6	03	0.7000	0.631	-9.9
04	1.0000	1.01	0.8	05	2.0000	1.98	-1.1	06	5.0000	4.69	-6.2
07	10.0000	10.2	1.6	08	20.0000	20.0	-0.2	09	30.0000	29.5	-1.6
10	50.0000	49.0	-2.0								

Initial Calibration Verification Summary Report

Calibration ID:	EC2000001	**Instrument ID:**	E-LCMS-01
Datafile ID:	20191230_016	**Column Name:**	1

Analyte	Lab Code	Type	Curve Fit	True Value	Calc Conc	Units	Result	Criteria
Perchlorate	EC2000001-11	T	Average RF	10	12.276	ng/mL	22.7	<= 25

ALS Group Houston

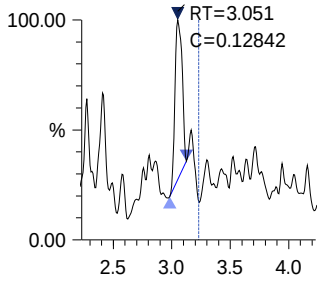
PERCHLORATE1

Date acquired: 12/30/2019 10:56:14 AM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20191230\20191230_007.lcd
Vial: 3 | Inj. Volume: 25.0000uL | Tray: 1

Name	Data Filename	Sample ID	Found RT	Area	Conc.	Acquired Date	Cal Point	Dil. Factor	Inj Vol	ISTD Area	Tray	Vial
Perchlorate	20191230_007	PERCHLORATE1	3.051	4022	0.12842	12/30/2019 10:56:14 AM	Yes	1.00000	25.0000	231680	1	3
Sodium Perchlorate-18O4_IS	20191230_007	PERCHLORATE1	3.051	231680	1.00000	12/30/2019 10:56:14 AM	No	1.00000	25.0000	231680	1	3

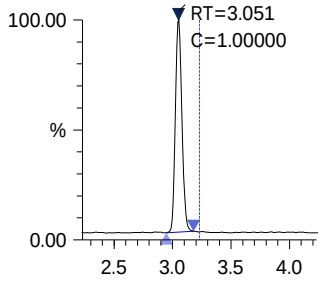
Perchlorate

Conc 0.12842
Area 4022
Q 99.00>83.00 (-) 1.27e3



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 231680
ISTD 107.00>89.00 (-) 5.94e4



ALS Group Houston

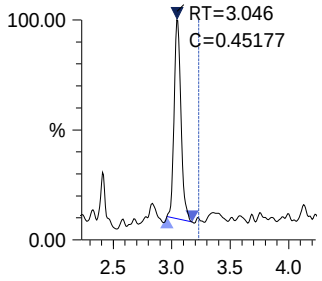
PERCHLORATE2

Date acquired: 12/30/2019 11:04:09 AM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20191230\20191230_008.lcd
Vial: 4 | Inj. Volume: 25.0000uL | Tray: 1

Name	Data Filename	Sample ID	Found RT	Area	Conc.	Acquired Date	Cal Point	Dil. Factor	Inj Vol	ISTD Area	Tray	Vial
Perchlorate	20191230_008	PERCHLORATE2	3.046	15985	0.45177	12/30/2019 11:04:09 AM	Yes	1.00000	25.0000	261704	1	4
Sodium Perchlorate-18O4_IS	20191230_008	PERCHLORATE2	3.045	261704	1.00000	12/30/2019 11:04:09 AM	No	1.00000	25.0000	261704	1	4

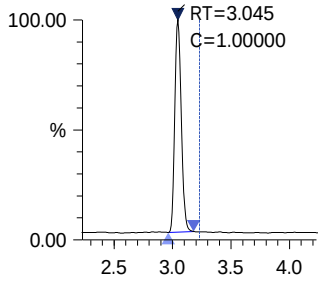
Perchlorate

Conc 0.45177
Area 15985
Q 99.00>83.00 (-) 4.21e3



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 261704
ISTD 107.00>89.00 (-) 6.75e4



ALS Group Houston

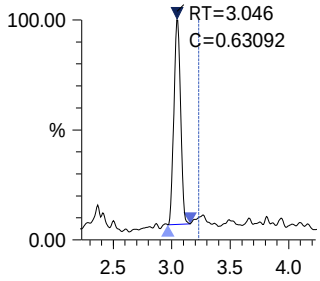
PERCHLORATE3

Date acquired: 12/30/2019 11:12:06 AM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20191230\20191230_009.lcd
Vial: 5 | Inj. Volume: 25.0000uL | Tray: 1

Name	Data Filename	Sample ID	Found RT	Area	Conc.	Acquired Date	Cal Point	Dil. Factor	Inj Vol	ISTD Area	Tray	Vial
Perchlorate	20191230_009	PERCHLORATE3	3.046	22031	0.63092	12/30/2019 11:12:06 AM	Yes	1.00000	25.0000	258274	1	5
Sodium Perchlorate-18O4_IS	20191230_009	PERCHLORATE3	3.044	258274	1.00000	12/30/2019 11:12:06 AM	No	1.00000	25.0000	258274	1	5

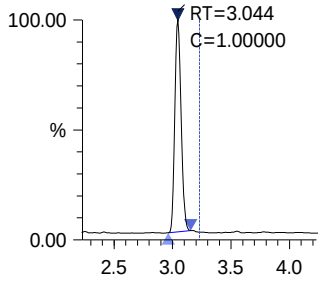
Perchlorate

Conc 0.63092
Area 22031
Q 99.00>83.00 (-) 5.75e3



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 258274
ISTD 107.00>89.00 (-) 6.88e4



ALS Group Houston

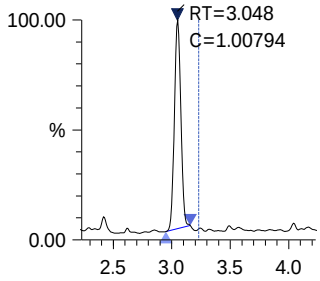
PERCHLORATE4

Date acquired: 12/30/2019 11:19:58 AM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20191230\20191230_010.lcd
Vial: 6 | Inj. Volume: 25.0000uL | Tray: 1

Name	Data Filename	Sample ID	Found RT	Area	Conc.	Acquired Date	Cal Point	Dil. Factor	Inj Vol	ISTD Area	Tray	Vial
Perchlorate	20191230_010	PERCHLORATE4	3.048	36488	1.00794	12/30/2019 11:19:58 AM	Yes	1.00000	25.0000	267754	1	6
Sodium Perchlorate-18O4_IS	20191230_010	PERCHLORATE4	3.046	267754	1.00000	12/30/2019 11:19:58 AM	No	1.00000	25.0000	267754	1	6

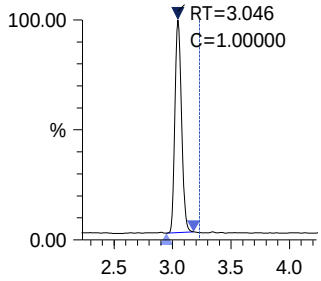
Perchlorate

Conc 1.00794
Area 36488
Q 99.00>83.00 (-) 9.73e3



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 267754
ISTD 107.00>89.00 (-) 6.78e4



ALS Group Houston

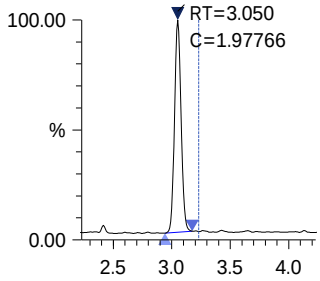
PERCHLORATE5

Date acquired: 12/30/2019 11:27:53 AM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20191230\20191230_011.lcd
Vial: 7 | Inj. Volume: 25.0000uL | Tray: 1

Name	Data Filename	Sample ID	Found RT	Area	Conc.	Acquired Date	Cal Point	Dil. Factor	Inj Vol	ISTD Area	Tray	Vial
Perchlorate	20191230_011	PERCHLORATE5	3.050	74631	1.97766	12/30/2019 11:27:53 AM	Yes	1.00000	25.0000	279118	1	7
Sodium Perchlorate-18O4_IS	20191230_011	PERCHLORATE5	3.046	279118	1.00000	12/30/2019 11:27:53 AM	No	1.00000	25.0000	279118	1	7

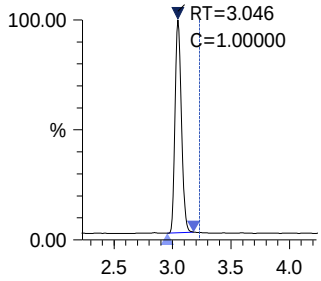
Perchlorate

Conc 1.97766
Area 74631
Q 99.00>83.00 (-) 1.92e4



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 279118
ISTD 107.00>89.00 (-) 7.33e4



ALS Group Houston

PERCHLORATE6

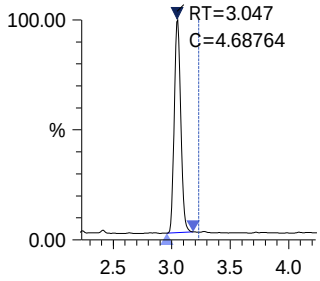
Date acquired: 12/30/2019 11:35:50 AM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20191230\20191230_012.lcd
Vial: 8 | Inj. Volume: 25.0000uL | Tray: 1

Name	Data Filename	Sample ID	Found RT	Area	Conc.	Acquired Date	Cal Point	Dil. Factor	Inj Vol	ISTD Area	Tray	Vial
Perchlorate	20191230_012	PERCHLORATE6	3.047	159122	4.68764	12/30/2019 11:35:50 AM	Yes	1.00000	25.0000	251072	1	8
Sodium Perchlorate-18O4_IS	20191230_012	PERCHLORATE6	3.045	251072	1.00000	12/30/2019 11:35:50 AM	No	1.00000	25.0000	251072	1	8

Perchlorate

Conc 4.68764
Area 159122

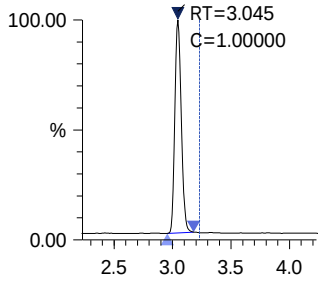
Q 99.00>83.00 (-) 4.12e4



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 251072

ISTD 107.00>89.00 (-) 6.53e4



ALS Group Houston

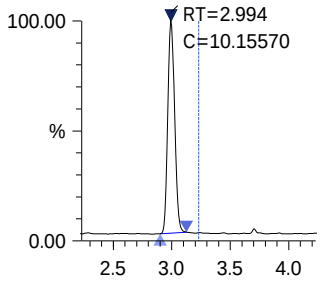
PERCHLORATE7

Date acquired: 12/30/2019 10:48:20 AM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20191230\20191230_006.lcd
Vial: 9 | Inj. Volume: 25.0000uL | Tray: 1

Name	Data Filename	Sample ID	Found RT	Area	Conc.	Acquired Date	Cal Point	Dil. Factor	Inj Vol	ISTD Area	Tray	Vial
Perchlorate	20191230_006	PERCHLORATE7	2.994	298821	10.15570	12/30/2019 10:48:20 AM	Yes	1.00000	25.0000	217632	1	9
Sodium Perchlorate-18O4_IS	20191230_006	PERCHLORATE7	2.991	217632	1.00000	12/30/2019 10:48:20 AM	No	1.00000	25.0000	217632	1	9

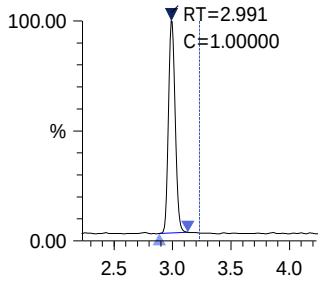
Perchlorate

Conc 10.15570
Area 298821
Q 99.00>83.00 (-) 7.46e4



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 217632
ISTD 107.00>89.00 (-) 5.38e4



ALS Group Houston

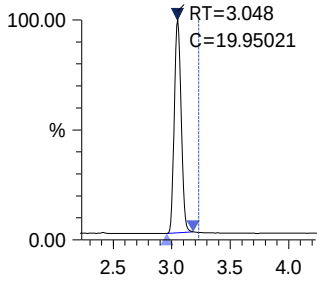
PERCHLORATE8

Date acquired: 12/30/2019 11:43:47 AM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20191230\20191230_013.lcd
Vial: 10 | Inj. Volume: 25.0000uL | Tray: 1

Name	Data Filename	Sample ID	Found RT	Area	Conc.	Acquired Date	Cal Point	Dil. Factor	Inj Vol	ISTD Area	Tray	Vial
Perchlorate	20191230_013	PERCHLORATE8	3.048	557358	19.95021	12/30/2019 11:43:47 AM	Yes	1.00000	25.0000	206636	1	10
Sodium Perchlorate-18O4_IS	20191230_013	PERCHLORATE8	3.045	206636	1.00000	12/30/2019 11:43:47 AM	No	1.00000	25.0000	206636	1	10

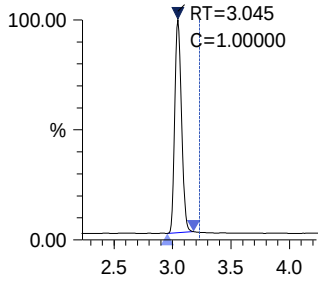
Perchlorate

Conc 19.95021
Area 557358
Q 99.00>83.00 (-) 1.37e5



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 206636
ISTD 107.00>89.00 (-) 5.11e4



ALS Group Houston

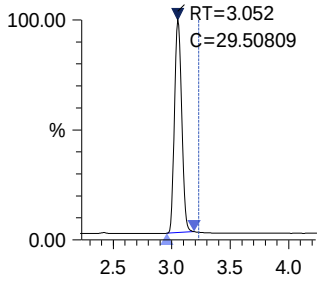
PERCHLORATE9

Date acquired: 12/30/2019 11:51:43 AM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20191230\20191230_014.lcd
Vial: 11 | Inj. Volume: 25.0000uL | Tray: 1

Name	Data Filename	Sample ID	Found RT	Area	Conc.	Acquired Date	Cal Point	Dil. Factor	Inj Vol	ISTD Area	Tray	Vial
Perchlorate	20191230_014	PERCHLORATE9	3.052	730647	29.50809	12/30/2019 11:51:43 AM	Yes	1.00000	25.0000	183142	1	11
Sodium Perchlorate-18O4_IS	20191230_014	PERCHLORATE9	3.049	183142	1.00000	12/30/2019 11:51:43 AM	No	1.00000	25.0000	183142	1	11

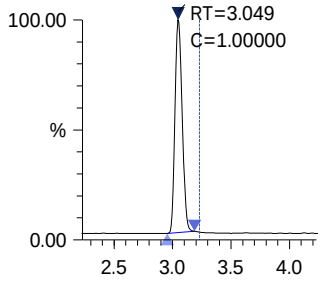
Perchlorate

Conc 29.50809
Area 730647
Q 99.00>83.00 (-) 1.70e5



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 183142
ISTD 107.00>89.00 (-) 4.27e4



ALS Group Houston

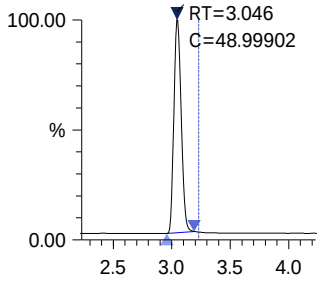
PERCHLORATE10

Date acquired: 12/30/2019 11:59:38 AM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20191230\20191230_015.lcd
Vial: 12 | Inj. Volume: 25.0000uL | Tray: 1

Name	Data Filename	Sample ID	Found RT	Area	Conc.	Acquired Date	Cal Point	Dil. Factor	Inj Vol	ISTD Area	Tray	Vial
Perchlorate	20191230_015	PERCHLORATE10	3.046	1090166	48.99902	12/30/2019 11:59:38 AM	Yes	1.00000	25.0000	164560	1	12
Sodium Perchlorate-18O4_IS	20191230_015	PERCHLORATE10	3.043	164560	1.00000	12/30/2019 11:59:38 AM	No	1.00000	25.0000	164560	1	12

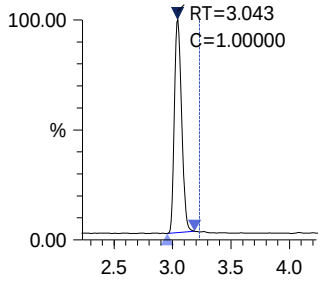
Perchlorate

Conc 48.99902
Area 1090166
Q 99.00>83.00 (-) 2.51e5



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 164560
ISTD 107.00>89.00 (-) 3.80e4



ALS Group Houston

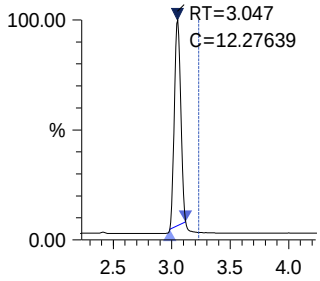
ICV

Date acquired: 12/30/2019 12:07:32 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20191230\20191230_016.lcd
Vial: 13 | Inj. Volume: 25.0000uL | Tray: 1

Name	Data Filename	Sample ID	Found RT	Area	Conc.	Acquired Date	Cal Point	Dil. Factor	Inj Vol	ISTD Area	Tray	Vial
Perchlorate	20191230_016	ICV	3.047	347932	12.27639	12/30/2019 12:07:32 PM	No	1.00000	25.0000	209626	1	13
Sodium Perchlorate-18O4_IS	20191230_016	ICV	3.045	209626	1.00000	12/30/2019 12:07:32 PM	No	1.00000	25.0000	209626	1	13

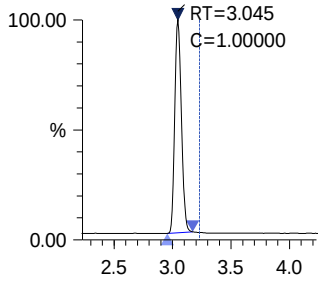
Perchlorate

Conc 12.27639
Area 347932
Q 99.00>83.00 (-) 9.49e4



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 209626
ISTD 107.00>89.00 (-) 5.28e4



Chromatograms and Selected Ion Monitoring

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 320, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

20200217

1st Review: Kneir
2nd Review: Hvan

ALS Environmental
LCMS01 -Shimadzu 8050

ICAL Date: 12/30/2019
Cal. Std. xp: 5/14/2020
ICAL ID: **EC2000001**

Mobile Phases **A:** 0.75% Formic Acid/Water 3100803-09 **B:** MeOH 3100802-01

	Sample Name		File Name	Acquisition Method	Dilution	R	Comments	Date/Time
	NULL		20200217_001	Perchlorate6850b.lcm	1x	☒		2/17/2020 10:47
	NULL		20200217_002	Perchlorate6850b.lcm	1x	☒		2/17/2020 10:52
	NULL		20200217_003	Perchlorate6850b.lcm	1x	☒		2/17/2020 10:57
	DIBLK		20200217_004	Perchlorate6850b.lcm	1x	☒		2/17/2020 11:02
	DIBLK		20200217_005	Perchlorate6850b.lcm	1x	☒		2/17/2020 11:10
	IB		20200217_006	Perchlorate6850b.lcm	1x	☒		2/17/2020 11:18
	PERCHLORATE7		20200217_007	Perchlorate6850b.lcm	1x	☒	3100805-02	2/17/2020 11:26
	LODV-0.5		20200217_008	Perchlorate6850b.lcm	1x	☒		2/17/2020 11:34
	EQ2000051-01		20200217_009	Perchlorate6850b.lcm	1x	☒		2/17/2020 11:42
	EQ2000051-02		20200217_010	Perchlorate6850b.lcm	1x	☒		2/17/2020 11:50
	EQ2000051-03RI		20200217_011	Perchlorate6850b.lcm	1x	☒	high IS-RR	2/17/2020 11:57
	E2000074-001		20200217_012	Perchlorate6850b.lcm	1x	☒		2/17/2020 12:05
	E2000075-001		20200217_013	Perchlorate6850b.lcm	1x	☒		2/17/2020 12:13
	E2000075-002		20200217_014	Perchlorate6850b.lcm	1x	☒		2/17/2020 12:21
	PERCHLORATE7		20200217_015	Perchlorate6850b.lcm	1x	☒	3100805-02	2/17/2020 12:29
	E2000075-003		20200217_016	Perchlorate6850b.lcm	1x	☒		2/17/2020 12:37
	E2000075-004RI		20200217_017	Perchlorate6850b.lcm	1x		high IS-RR	2/17/2020 12:45
	E2000075-005RI		20200217_018	Perchlorate6850b.lcm	1x		high IS-RR	2/17/2020 12:53
	E2000075-006RI		20200217_019	Perchlorate6850b.lcm	1x		high IS-RR	2/17/2020 13:01
	E2000076-001RI		20200217_020	Perchlorate6850b.lcm	1x		high IS-RR	2/17/2020 13:09
	E2000087-001RI		20200217_021	Perchlorate6850b.lcm	1x		high IS-RR	2/17/2020 13:16
	E2000087-002		20200217_022	Perchlorate6850b.lcm	1x	☒		2/17/2020 13:24
	E2000087-003RI		20200217_023	Perchlorate6850b.lcm	1x		high IS-RR	2/17/2020 13:32
	E2000092-001RI		20200217_024	Perchlorate6850b.lcm	1x		high IS-RR	2/17/2020 13:40
	PERCHLORATE7		20200217_25	Perchlorate6850b.lcm	1x	☒	3100805-02	2/17/2020 13:48
	LODV		20200217_026	Perchlorate6850b.lcm	1x	☒		2/17/2020 14:15
	LODV		20200217_027	Perchlorate6850b.lcm	1x	☒		2/17/2020 14:22
	E2000075-004		20200217_028	Perchlorate6850b.lcm	1x	☒		2/17/2020 14:30
	E2000075-005		20200217_029	Perchlorate6850b.lcm	1x	☒		2/17/2020 14:38
	E2000075-006		20200217_030	Perchlorate6850b.lcm	1x	☒		2/17/2020 14:46
	E2000076-001		20200217_031	Perchlorate6850b.lcm	1x	☒		2/17/2020 14:54
	E2000087-001		20200217_032	Perchlorate6850b.lcm	1x	☒		2/17/2020 15:02
	E2000087-003		20200217_033	Perchlorate6850b.lcm	1x	☒		2/17/2020 15:10
	E2000092-001		20200217_034	Perchlorate6850b.lcm	1x	☒		2/17/2020 15:18
	EQ2000051-03		20200217_035	Perchlorate6850b.lcm	1x	☒		2/17/2020 16:15
	PERCHLORATE7		20200217_036	Perchlorate6850b.lcm	1x	☒	3100805-02	2/17/2020 16:23

Internal Standard Summary

QAP: LAB QAP
Spec No: 12474 Ver. 1

Test: 6850/ClO4

Instrument ID: E-LCMS-01
Date Acquired: 2/17/20 11:26

Analysis Lot: 670318

		Sodium Perchlorate-18O4	
		Area	**RT**
	ICAL Average ==>	230,109	3.04
	Upper Limit ==>	345,164	5.04
	Lower Limit ==>	115,055	1.04
Associated Analyses			
20200217_0(EQ2000058-01	Continuing Calibration Ve	252,380	3.16
20200217_0(EQ2000051-01	Method Blank	158,257	3.16
20200217_01 EQ2000051-02	Lab Control Sample	255,372	3.16

Internal Standard Summary

QAP: LAB QAP
Spec No: 12474 Ver. 1

Test: 6850/ClO4

Instrument ID: E-LCMS-01
Date Acquired: 2/17/20 12:29

Analysis Lot: 670318

		Sodium Perchlorate-18O4	
		Area	**RT**
	ICAL Average ==>	230,109	3.04
	Upper Limit ==>	345,164	5.04
	Lower Limit ==>	115,055	1.04
Associated Analyses			
20200217_01 EQ2000058-02	Continuing Calibration Ve	282,852	3.16
20200217_02 E2000087-002	GW-MW-84-20200129-01	322,272	3.15

Internal Standard Summary

QAP: LAB QAP
Spec No: 12474 Ver. 1

Test: 6850/ClO4

Instrument ID: E-LCMS-01
Date Acquired: 2/17/20 13:48

Analysis Lot: 670318

			Sodium Perchlorate-18O4	
			Area	**RT**
		ICAL Average ==>	230,109	3.04
		Upper Limit ==>	345,164	5.04
		Lower Limit ==>	115,055	1.04
Associated Analyses				
20200217_02	EQ2000058-03	Continuing Calibration Ve	266,026	3.16
20200217_03	E2000087-001	GW-MW-85-20200129-01	301,657	3.15
20200217_03	E2000087-003	EB-001-20200129-01	253,755	3.16
20200217_03	EQ2000051-03	Duplicate Lab Control San	287,501	3.11

Internal Standard Summary

QAP: LAB QAP
Spec No: 12474 Ver. 1

Test: 6850/ClO4

Instrument ID: E-LCMS-01
Date Acquired: 2/17/20 16:23

Analysis Lot: 670318

		Sodium Perchlorate-18O4	
		Area	**RT**
	ICAL Average ==>	230,109	3.04
	Upper Limit ==>	345,164	5.04
	Lower Limit ==>	115,055	1.04
Associated Analyses			
20200217_03 EQ2000058-04	Continuing Calibration Ve	293,622	3.16

Internal Standard Summary

QAP: LAB QAP
Spec No: 99479 Ver. 1

Test: 6850/ClO4 DOD

Instrument ID: E-LCMS-01
Date Acquired: 2/17/20 11:26

Analysis Lot: 670318

		Sodium Perchlorate-18O4	
		Area	**RT**
	ICAL Average ==>	230,109	3.04
	Upper Limit ==>	345,164	5.04
	Lower Limit ==>	115,055	1.04
Associated Analyses			
20200217_0(EQ2000058-01	Continuing Calibration Ve	252,380	3.16
20200217_0(EQ2000051-01	Method Blank	158,257	3.16
20200217_01 EQ2000051-02	Lab Control Sample	255,372	3.16
20200217_01 E2000074-001	LH18/24-SP650_12320_E	338,697	3.14
20200217_01 E2000075-001	HBW7_012020	298,684	3.15
20200217_01 E2000075-002	HBW10_012020	320,264	3.16

Internal Standard Summary

QAP: LAB QAP
Spec No: 99479 Ver. 1

Test: 6850/ClO4 DOD

Instrument ID: E-LCMS-01
Date Acquired: 2/17/20 12:29

Analysis Lot: 670318

		Sodium Perchlorate-18O4	
		Area	**RT**
	ICAL Average ==>	230,109	3.04
	Upper Limit ==>	345,164	5.04
	Lower Limit ==>	115,055	1.04
Associated Analyses			
20200217_01 EQ2000058-02	Continuing Calibration Ve	282,852	3.16
20200217_01 E2000075-003	HBW1_012020	293,434	3.15

Internal Standard Summary

QAP: LAB QAP
Spec No: 99479 Ver. 1

Test: 6850/ClO4 DOD

Instrument ID: E-LCMS-01
Date Acquired: 2/17/20 13:48

Analysis Lot: 670318

		Sodium Perchlorate-18O4	
		Area	**RT**
	ICAL Average ==>	230,109	3.04
	Upper Limit ==>	345,164	5.04
	Lower Limit ==>	115,055	1.04
Associated Analyses			
20200217_02 EQ2000058-03	Continuing Calibration Ve	266,026	3.16
20200217_02 E2000075-004	GPW1_012020	280,167	3.16
20200217_02 E2000075-005	GPW1_012020_a	291,838	3.16
20200217_03 E2000075-006	GPW3_012020	311,790	3.16
20200217_03 E2000076-001	LH18/24-SP650_12820_E	322,092	3.14
20200217_03 E2000092-001	LH18/24-SP650_020420_	295,380	3.14
20200217_03 EQ2000051-03	Duplicate Lab Control San	287,501	3.11

Internal Standard Summary

QAP: LAB QAP
Spec No: 99479 Ver. 1

Test: 6850/ClO4 DOD

Instrument ID: E-LCMS-01
Date Acquired: 2/17/20 16:23

Analysis Lot: 670318

		Sodium Perchlorate-18O4	
		Area	**RT**
	ICAL Average ==>	230,109	3.04
	Upper Limit ==>	345,164	5.04
	Lower Limit ==>	115,055	1.04
Associated Analyses			
20200217_03 EQ2000058-04	Continuing Calibration Ve	293,622	3.16

Quantitation Report

Data File:	I:\LCMS01\DATA\20200217\20200217_007	**Instrument:**	E-LCMS-01
Acqu Date:	2/17/20 11:26	**Vial:**	8
Run Type:	CCV	**Dilution:**	1
Lab ID:	EQ2000058-01	**Raw Units:**	ng/mL

Bottle ID:		**Tier:**	IV	**Matrix:**	Water
Prod Code:	ClO4 DOD	**Collect Date:**	1/23/20	**Receive Date:**	1/27/20

Analysis Lot:	670318	**Prep Lot:**		**Report Group:**	EQ2000058
Analysis Method:	6850	**Prep Method:**			
		Prep Date:			

Title:	Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass	**Calibration ID:**	EC2000001
		Report List ID:	21851

Internal Standard Compounds

Parameter Name	RT	RT Dev	Response	Solution Conc	Area Criteria
Sodium Perchlorate-18O4	3.158		252380	1.00000	OK

Target Compounds

Parameter Name	RT	RT Dev	Response	Solution Conc	Rpt?
Perchlorate	3.160		361516	10.59482	Y

U: Undetected at or above MDL
J: Analyte detected above MDL, but below MRL
B: Hit above MRL also found in Method Blank
E: Analyte concentration above high point of ICAL
N: Presumptive evidence of compound

D: Result from dilution
m: Manual integration performed
d: Compound manually deleted
NR: Analyte not reported from this analysis

*: Result fails acceptance criteria
#: Acceptance criteria not applicable
?: Insufficient information to determine acceptance
e: Result >= MRL, but MRL less than low point of ICAL
c: check for co-elution

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Continuing Calibration Verification Summary

Calibration ID: EC2000001
QAP Name: LAB QAP
List Name: Perchlorate RJ DOD
Data File: I:\LCMS01\DATA\20200217\20200217_007

Spec Set: #99479 v. 1
List ID: #21851
Signal ID: 1

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Perchlorate	10.0	10.6	0.1352	0.1432	6		± 15%	Average RF

Quantitation Report

Data File:	I:\LCMS01\DATA\20200217\20200217_015	**Instrument:**	E-LCMS-01
Acqu Date:	2/17/20 12:29	**Vial:**	6
Run Type:	CCV	**Dilution:**	1
Lab ID:	EQ2000058-02	**Raw Units:**	ng/mL

Bottle ID:		**Tier:**	IV	**Matrix:**	Water
Prod Code:	ClO4 DOD	**Collect Date:**	1/23/20	**Receive Date:**	1/27/20

Analysis Lot:	670318	**Prep Lot:**		**Report Group:**	EQ2000058
Analysis Method:	6850	**Prep Method:**			
		Prep Date:			

Title:	Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass	**Calibration ID:**	EC2000001
		Report List ID:	21851

Internal Standard Compounds

Parameter Name	RT	RT Dev	Response	Solution Conc	Area Criteria
Sodium Perchlorate-18O4	3.159		282852	1.00000	OK

Target Compounds

Parameter Name	RT	RT Dev	Response	Solution Conc	Rpt?
Perchlorate	3.161		407931	10.66715	Y

U: Undetected at or above MDL
J: Analyte detected above MDL, but below MRL
B: Hit above MRL also found in Method Blank
E: Analyte concentration above high point of ICAL
N: Presumptive evidence of compound

D: Result from dilution
m: Manual integration performed
d: Compound manually deleted
NR: Analyte not reported from this analysis

*: Result fails acceptance criteria
#: Acceptance criteria not applicable
?: Insufficient information to determine acceptance
e: Result >= MRL, but MRL less than low point of ICAL
c: check for co-elution

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Continuing Calibration Verification Summary

Calibration ID: EC2000001
Spec Set: #99479 v. 1
QAP Name: LAB QAP
List ID: #21851
List Name: Perchlorate RJ DOD
Signal ID: 1
Data File: I:\LCMS01\DATA\20200217\20200217_015

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Perchlorate	10.0	10.7	0.1352	0.1442	7		± 15%	Average RF

Quantitation Report

Data File:	I:\LCMS01\DATA\20200217\20200217_025	**Instrument:**	E-LCMS-01
Acqu Date:	2/17/20 13:48	**Vial:**	4
Run Type:	CCV	**Dilution:**	1
Lab ID:	EQ2000058-03	**Raw Units:**	ng/mL

Bottle ID:		**Tier:**	IV	**Matrix:**	Water
Prod Code:	ClO4 DOD	**Collect Date:**	1/23/20	**Receive Date:**	1/27/20

Analysis Lot:	670318	**Prep Lot:**		**Report Group:**	EQ2000058
Analysis Method:	6850	**Prep Method:**			
		Prep Date:			

Title:	Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass	**Calibration ID:**	EC2000001
		Report List ID:	21851

Internal Standard Compounds

Parameter Name	RT	RT Dev	Response	Solution Conc	Area Criteria
Sodium Perchlorate-18O4	3.158		266026	1.00000	OK

Target Compounds

Parameter Name	RT	RT Dev	Response	Solution Conc	Rpt?
Perchlorate	3.159		391076	10.87321	Y

U: Undetected at or above MDL
J: Analyte detected above MDL, but below MRL
B: Hit above MRL also found in Method Blank
E: Analyte concentration above high point of ICAL
N: Presumptive evidence of compound

D: Result from dilution
m: Manual integration performed
d: Compound manually deleted
NR: Analyte not reported from this analysis

*: Result fails acceptance criteria
#: Acceptance criteria not applicable
?: Insufficient information to determine acceptance
e: Result >= MRL, but MRL less than low point of ICAL
c: check for co-elution

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Continuing Calibration Verification Summary

Calibration ID: EC2000001 **Spec Set:** #99479 v. 1

QAP Name: LAB QAP **List ID:** #21851

List Name: Perchlorate RJ DOD **Signal ID:** 1

Data File: I:\LCMS01\DATA\20200217\20200217_025

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Perchlorate	10.0	10.9	0.1352	0.1470	9		± 15%	Average RF

Quantitation Report

Data File:	I:\LCMS01\DATA\20200217\20200217_036	**Instrument:**	E-LCMS-01
Acqu Date:	2/17/20 16:23	**Vial:**	2
Run Type:	CCV	**Dilution:**	1
Lab ID:	EQ2000058-04	**Raw Units:**	ng/mL

Bottle ID:		**Tier:**	IV	**Matrix:**	Water
Prod Code:	ClO4 DOD	**Collect Date:**	1/23/20	**Receive Date:**	1/27/20

Analysis Lot:	670318	**Prep Lot:**		**Report Group:**	EQ2000058
Analysis Method:	6850	**Prep Method:**			
		Prep Date:			

Title:	Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass	**Calibration ID:**	EC2000001
		Report List ID:	21851

Internal Standard Compounds

Parameter Name	RT	RT Dev	Response	Solution Conc	Area Criteria
Sodium Perchlorate-18O4	3.158		293622	1.00000	OK

Target Compounds

Parameter Name	RT	RT Dev	Response	Solution Conc	Rpt?
Perchlorate	3.159		417294	10.51172	Y

U: Undetected at or above MDL
J: Analyte detected above MDL, but below MRL
B: Hit above MRL also found in Method Blank
E: Analyte concentration above high point of ICAL
N: Presumptive evidence of compound

D: Result from dilution
m: Manual integration performed
d: Compound manually deleted
NR: Analyte not reported from this analysis

*: Result fails acceptance criteria
#: Acceptance criteria not applicable
?: Insufficient information to determine acceptance
e: Result >= MRL, but MRL less than low point of ICAL
c: check for co-elution

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Continuing Calibration Verification Summary

Calibration ID: EC2000001
Spec Set: #99479 v. 1
QAP Name: LAB QAP
List ID: #21851
List Name: Perchlorate RJ DOD
Signal ID: 1
Data File: I:\LCMS01\DATA\20200217\20200217_036

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Perchlorate	10.0	10.5	0.1352	0.1421	5		± 15%	Average RF

Quantitation Report

Data File:	I:\LCMS01\DATA\20200217\20200217_009	**Instrument:**	E-LCMS-01
Acqu Date:	2/17/20 11:42	**Vial:**	21
Run Type:	MB	**Dilution:**	1
Lab ID:	EQ2000051-01	**Raw Units:**	ng/mL

Bottle ID:		**Tier:**	II	**Matrix:**	Water
Prod Code:	ClO4 DOD	**Collect Date:**	1/23/20	**Receive Date:**	1/27/20

Analysis Lot:	670318	**Prep Lot:**	353630	**Report Group:**	EQ2000051
Analysis Method:	6850	**Prep Method:**	Method		
		Prep Date:	2/11/20		

Title:	Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass	**Calibration ID:**	EC2000001
		Report List ID:	21851

Internal Standard Compounds

Parameter Name	RT	RT Dev	Response	Solution Conc	Area Criteria
Sodium Perchlorate-18O4	3.158		158257	1.00000	OK

Target Compounds

Final Conc.Units: ug/L

Parameter Name	RT	RT Dev	Response	Solution Conc	Final Conc	Q	Rpt?
Perchlorate	0		0	0	0	U	Y

Prep Amount:	10 mL	**Dilution:**	1
Prep Final Amount:	10.00 mL	**Basis Factor:**	100.00

U: Undetected at or above MDL
J: Analyte detected above MDL, but below MRL
B: Hit above MRL also found in Method Blank
E: Analyte concentration above high point of ICAL
N: Presumptive evidence of compound

D: Result from dilution
m: Manual integration performed
d: Compound manually deleted
NR: Analyte not reported from this analysis

*: Result fails acceptance criteria
#: Acceptance criteria not applicable
?: Insufficient information to determine acceptance
e: Result >= MRL, but MRL less than low point of ICAL
c: check for co-elution

Printed: 2/18/20 13:20

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Quantitation Report

Data File:	I:\LCMS01\DATA\20200217\20200217_010	**Instrument:**	E-LCMS-01
Acqu Date:	2/17/20 11:50	**Vial:**	24
Run Type:	LCS	**Dilution:**	1
Lab ID:	EQ2000051-02	**Raw Units:**	ng/mL

Bottle ID:		**Tier:**	II	**Matrix:**	Water
Prod Code:	ClO4 DOD	**Collect Date:**	1/23/20	**Receive Date:**	1/27/20

Analysis Lot:	670318	**Prep Lot:**	353630	**Report Group:**	EQ2000051
Analysis Method:	6850	**Prep Method:**	Method		
		Prep Date:	2/11/20		

Title:	Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass	**Calibration ID:**	EC2000001
		Report List ID:	21851

Internal Standard Compounds

Parameter Name	RT	RT Dev	Response	Solution Conc	Area Criteria
Sodium Perchlorate-18O4	3.159	+0.00	255372	1.00000	OK

Target Compounds

Final Conc.Units: ug/L

Parameter Name	RT	RT Dev	Response	Solution Conc	Final Conc	Q	Rpt?
Perchlorate	3.160		29539	0.85554	0.856		Y

Prep Amount:	10 mL	**Dilution:**	1
Prep Final Amount:	10.00 mL	**Basis Factor:**	100.00

U: Undetected at or above MDL
J: Analyte detected above MDL, but below MRL
B: Hit above MRL also found in Method Blank
E: Analyte concentration above high point of ICAL
N: Presumptive evidence of compound

D: Result from dilution
m: Manual integration performed
d: Compound manually deleted
NR: Analyte not reported from this analysis

*: Result fails acceptance criteria
#: Acceptance criteria not applicable
?: Insufficient information to determine acceptance
e: Result >= MRL, but MRL less than low point of ICAL
c: check for co-elution

Printed: 2/18/20 13:20

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Quantitation Report

Data File:	I:\LCMS01\DATA\20200217\20200217_035	**Instrument:**	E-LCMS-01
Acqu Date:	2/17/20 16:15	**Vial:**	26
Run Type:	DLCS	**Dilution:**	1
Lab ID:	EQ2000051-03	**Raw Units:**	ng/mL

Bottle ID:		**Tier:**	II	**Matrix:**	Water
Prod Code:	ClO4 DOD	**Collect Date:**	1/23/20	**Receive Date:**	1/27/20

Analysis Lot:	670318	**Prep Lot:**	353630	**Report Group:**	EQ2000051
Analysis Method:	6850	**Prep Method:**	Method		
		Prep Date:	2/11/20		

Title:	Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass	**Calibration ID:**	EC2000001
		Report List ID:	21851

Internal Standard Compounds

Parameter Name	RT	RT Dev	Response	Solution Conc	Area Criteria
Sodium Perchlorate-18O4	3.105	-0.05	287501	1.00000	OK

Target Compounds

Final Conc.Units: ug/L

Parameter Name	RT	RT Dev	Response	Solution Conc	Final Conc	Q	Rpt?
Perchlorate	3.106	-0.05	32714	0.84160	0.842		Y

Prep Amount:	10 mL	**Dilution:**	1
Prep Final Amount:	10.00 mL	**Basis Factor:**	100.00

U: Undetected at or above MDL
J: Analyte detected above MDL, but below MRL
B: Hit above MRL also found in Method Blank
E: Analyte concentration above high point of ICAL
N: Presumptive evidence of compound

D: Result from dilution
m: Manual integration performed
d: Compound manually deleted
NR: Analyte not reported from this analysis

*: Result fails acceptance criteria
#: Acceptance criteria not applicable
?: Insufficient information to determine acceptance
e: Result >= MRL, but MRL less than low point of ICAL
c: check for co-elution

Printed: 2/18/20 13:20

\\alprews001\starlims$\LIMSReps\QuantValidation.rpt

Quantitation Report

Data File:	I:\LCMS01\DATA\20200217\20200217_031	**Instrument:**	E-LCMS-01
Acqu Date:	2/17/20 14:54	**Vial:**	16
Run Type:	N/A	**Dilution:**	1
Lab ID:	E2000076-001	**Raw Units:**	ng/mL

Bottle ID:	E2000076-001.01	**Tier:**	IV	**Matrix:**	Water
Prod Code:	ClO4 DOD	**Collect Date:**	1/28/20	**Receive Date:**	1/29/20

Analysis Lot:	670318	**Prep Lot:**	353630	**Report Group:**	E2000076
Analysis Method:	6850	**Prep Method:**	Method		
		Prep Date:	2/11/20		

Title:	Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass	**Calibration ID:**	EC2000001
		Report List ID:	21851

Internal Standard Compounds

Parameter Name	RT	RT Dev	Response	Solution Conc	Area Criteria
Sodium Perchlorate-18O4	3.142	-0.02	322092	1.00000	OK

Target Compounds

Final Conc.Units: ug/L

Parameter Name	RT	RT Dev	Response	Solution Conc	Final Conc	Q	Rpt?
Perchlorate	3.142	-0.02	14030	0.32219	0.322		Y

Prep Amount:	10 mL	**Dilution:**	1
Prep Final Amount:	10.00 mL	**Basis Factor:**	100.00

U: Undetected at or above MDL
J: Analyte detected above MDL, but below MRL
B: Hit above MRL also found in Method Blank
E: Analyte concentration above high point of ICAL
N: Presumptive evidence of compound

D: Result from dilution
m: Manual integration performed
d: Compound manually deleted
NR: Analyte not reported from this analysis

*: Result fails acceptance criteria
#: Acceptance criteria not applicable
?: Insufficient information to determine acceptance
e: Result >= MRL, but MRL less than low point of ICAL
c: check for co-elution

Printed: 2/18/20 13:20

\\alprews001\starlims$\LIMSReps\QuantValidation.rpt

ALS Group Houston

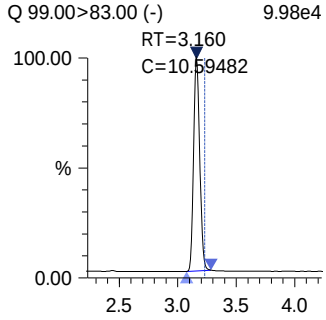
20200217_007

Sample ID: PERCHLORATE7
Date acquired: 2/17/2020 11:26:26 AM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200217\20200217_007.lcd
Vial: 3 | Inj. Volume: 25.0000uL | Tray: 1

Name	Data Filename	Sample ID	Found RT	Area	Conc.	Acquired Date	Cal Point	Dil. Factor	Inj Vol	ISTD Area	Tray	Vial
Perchlorate	20200217_007	PERCHLORATE7	3.160	361516	10.59482	2/17/2020 11:26:26 AM	No	1.00000	25.0000	252380	1	3
Sodium Perchlorate-18O4_IS	20200217_007	PERCHLORATE7	3.158	252380	1.00000	2/17/2020 11:26:26 AM	No	1.00000	25.0000	252380	1	3

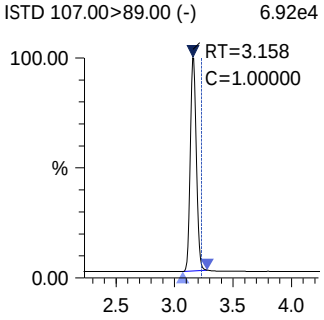
Perchlorate

Conc 10.59482
Area 361516



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 252380



ALS Group Houston

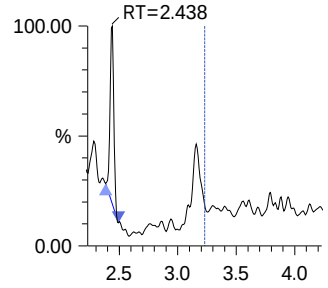
20200217_009

Sample ID: EQ2000051-01
Date acquired: 2/17/2020 11:42:11 AM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200217\20200217_009.lcd
Vial: 5 | Inj. Volume: 25.0000uL | Tray: 1

Name	Data Filename	Sample ID	Found RT	Area	Conc.	Acquired Date	Cal Point	Dil. Factor	Inj Vol	ISTD Area	Tray	Vial
Perchlorate	20200217_009	EQ2000051-01	----	----	----	2/17/2020 11:42:11 AM	No	1.00000	25.0000	158257	1	5
Sodium Perchlorate-18O4_IS	20200217_009	EQ2000051-01	3.158	158257	1.00000	2/17/2020 11:42:11 AM	No	1.00000	25.0000	158257	1	5

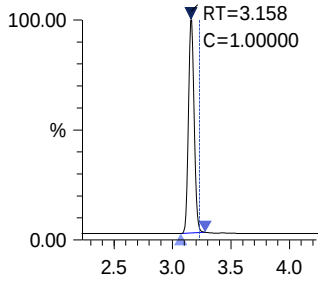
Perchlorate

Conc ----
Area ----
Q 99.00>83.00 (-) 3.96e2



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 158257
ISTD 107.00>89.00 (-) 4.61e4



ALS Group Houston

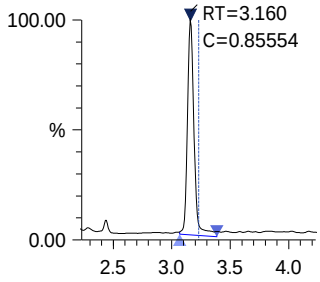
20200217_010

Sample ID: EQ2000051-02
Date acquired: 2/17/2020 11:50:05 AM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200217\20200217_010.lcd
Vial: 6 | Inj. Volume: 25.0000uL | Tray: 1

Name	Data Filename	Sample ID	Found RT	Area	Conc.	Acquired Date	Cal Point	Dil. Factor	Inj Vol	ISTD Area	Tray	Vial
Perchlorate	20200217_010	EQ2000051-02	3.160	29539	0.85554	2/17/2020 11:50:05 AM	No	1.00000	25.0000	255372	1	6
Sodium Perchlorate-18O4_IS	20200217_010	EQ2000051-02	3.159	255372	1.00000	2/17/2020 11:50:05 AM	No	1.00000	25.0000	255372	1	6

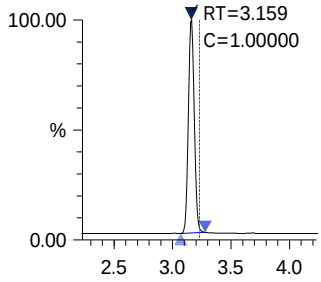
Perchlorate

Conc 0.85554
Area 29539
Q 99.00>83.00 (-) 7.48e3



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 255372
ISTD 107.00>89.00 (-) 7.19e4



ALS Group Houston

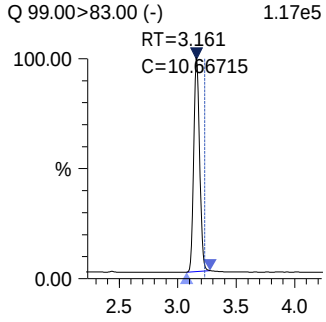
PERCHLORATE7

Date acquired: 2/17/2020 12:29:39 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200217\20200217_015.lcd
Vial: 3 | Inj. Volume: 25.0000uL | Tray: 1

Name	Data Filename	Sample ID	Found RT	Area	Conc.	Acquired Date	Cal Point	Dil. Factor	Inj Vol	ISTD Area	Tray	Vial
Perchlorate	20200217_015	PERCHLORATE7	3.161	407931	10.66715	2/17/2020 12:29:39 PM	No	1.00000	25.0000	282852	1	3
Sodium Perchlorate-18O4_IS	20200217_015	PERCHLORATE7	3.159	282852	1.00000	2/17/2020 12:29:39 PM	No	1.00000	25.0000	282852	1	3

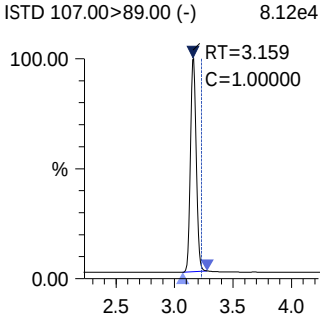
Perchlorate

Conc 10.66715
Area 407931



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 282852



ALS Group Houston

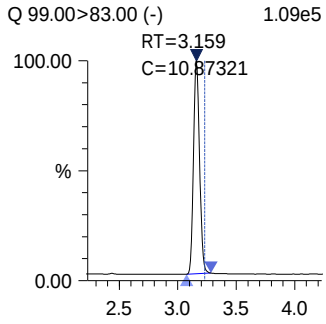
PERCHLORATE7

Date acquired: 2/17/2020 1:48:35 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200217\20200217_025.lcd
Vial: 3 | Inj. Volume: 25.0000uL | Tray: 1

Name	Data Filename	Sample ID	Found RT	Area	Conc.	Acquired Date	Cal Point	Dil. Factor	Inj Vol	ISTD Area	Tray	Vial
Perchlorate	20200217_025	PERCHLORATE7	3.159	391076	10.87321	2/17/2020 1:48:35 PM	No	1.00000	25.0000	266026	1	3
Sodium Perchlorate-18O4_IS	20200217_025	PERCHLORATE7	3.158	266026	1.00000	2/17/2020 1:48:35 PM	No	1.00000	25.0000	266026	1	3

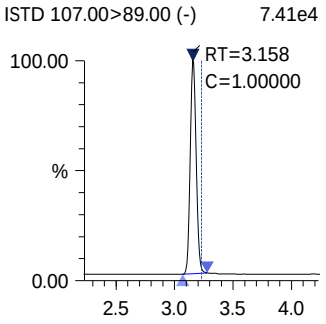
Perchlorate

Conc 10.87321
Area 391076



Sodium Perchlorate-18O4 _IS

Conc 1.00000
Area 266026



ALS Group Houston

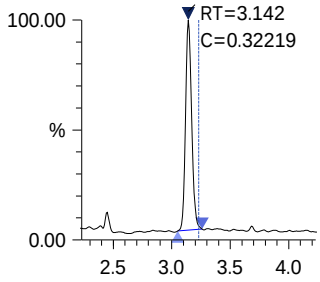
20200217_031

Sample ID: E2000076-001
Date acquired: 2/17/2020 2:54:34 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200217\20200217_031.lcd
Vial: 25 | Inj. Volume: 25.0000uL | Tray: 1

Name	Data Filename	Sample ID	Found RT	Area	Conc.	Acquired Date	Cal Point	Dil. Factor	Inj Vol	ISTD Area	Tray	Vial
Perchlorate	20200217_031	E2000076-001	3.142	14030	0.32219	2/17/2020 2:54:34 PM	No	1.00000	25.0000	322092	1	25
Sodium Perchlorate-18O4_IS	20200217_031	E2000076-001	3.142	322092	1.00000	2/17/2020 2:54:34 PM	No	1.00000	25.0000	322092	1	25

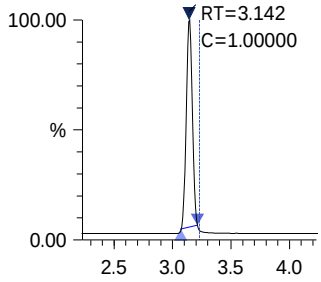
Perchlorate

Conc 0.32219
Area 14030
Q 99.00>83.00 (-) 3.90e3



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 322092
ISTD 107.00>89.00 (-) 9.19e4



ALS Group Houston

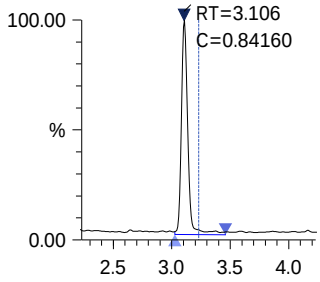
20200217_035

Sample ID: EQ2000051-03
Date acquired: 2/17/2020 4:15:43 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200217\20200217_035.lcd
Vial: 29 | Inj. Volume: 25.0000uL | Tray: 1

Name	Data Filename	Sample ID	Found RT	Area	Conc.	Acquired Date	Cal Point	Dil. Factor	Inj Vol	ISTD Area	Tray	Vial
Perchlorate	20200217_035	EQ2000051-03	3.106	32714	0.84160	2/17/2020 4:15:43 PM	No	1.00000	25.0000	287501	1	29
Sodium Perchlorate-18O4_IS	20200217_035	EQ2000051-03	3.105	287501	1.00000	2/17/2020 4:15:43 PM	No	1.00000	25.0000	287501	1	29

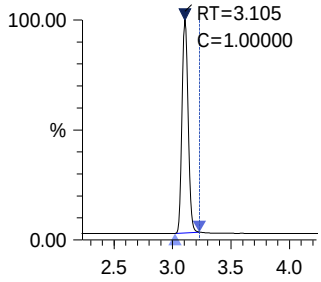
Perchlorate

Conc 0.84160
Area 32714
Q 99.00>83.00 (-) 8.39e3



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 287501
ISTD 107.00>89.00 (-) 8.11e4



ALS Group Houston

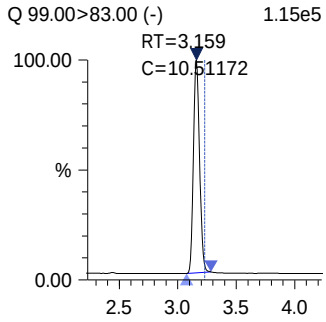
20200217_036

Sample ID: PERCHLORATE7
Date acquired: 2/17/2020 4:23:39 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200217\20200217_036.lcd
Vial: 3 | Inj. Volume: 25.0000uL | Tray: 1

Name	Data Filename	Sample ID	Found RT	Area	Conc.	Acquired Date	Cal Point	Dil. Factor	Inj Vol	ISTD Area	Tray	Vial
Perchlorate	20200217_036	PERCHLORATE7	3.159	417294	10.51172	2/17/2020 4:23:39 PM	No	1.00000	25.0000	293622	1	3
Sodium Perchlorate-18O4_IS	20200217_036	PERCHLORATE7	3.158	293622	1.00000	2/17/2020 4:23:39 PM	No	1.00000	25.0000	293622	1	3

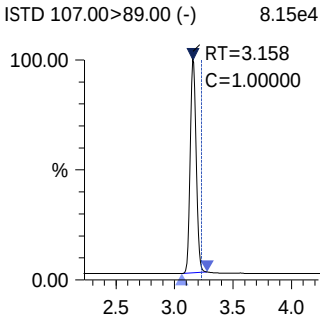
Perchlorate

Conc 10.51172
Area 417294



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 293622



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www.alsglobal.com

February 05, 2020

Analytical Report for Service Request No: K2000907

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

RE: HS20011311

Dear RJ,

Enclosed are the results of the sample(s) submitted to our laboratory January 31, 2020
For your reference, these analyses have been assigned our service request number **K2000907.**

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

RIGHT SOLUTIONS | RIGHT PARTNER

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ALS Group USA, Corp
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Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LOD	Limit of Detection
LOQ	Limit of Quantitation
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

Inorganic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
E	The result is an estimate amount because the value exceeded the instrument calibration range.
J	The result is an estimated value.
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
i	The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
X	See case narrative.
Q	See case narrative. One or more quality control criteria was outside the limits.
H	The holding time for this test is immediately following sample collection. The samples were analyzed as soon as possible after receipt by the laboratory.

Metals Data Qualifiers

#	The control limit criteria is not applicable. See case narrative.
J	The result is an estimated value.
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
M	The duplicate injection precision was not met.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.
S	The reported value was determined by the Method of Standard Additions (MSA).
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
i	The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
X	See case narrative.
+	The correlation coefficient for the MSA is less than 0.995.
Q	See case narrative. One or more quality control criteria was outside the limits.

Organic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
A	A tentatively identified compound, a suspected aldol-condensation product.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
C	The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
D	The reported result is from a dilution.
E	The result is an estimated value.
J	The result is an estimated value.
N	The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
P	The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results.
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
i	The MRL/MDL or LOQ/LOD is elevated due to a chromatographic interference.
X	See case narrative.
Q	See case narrative. One or more quality control criteria was outside the limits.

Additional Petroleum Hydrocarbon Specific Qualifiers

F	The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
L	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
H	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
O	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
Y	The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
Z	The chromatographic fingerprint does not resemble a petroleum product.

ALS Group USA Corp. dba ALS Environmental (ALS) - Kelso
State Certifications, Accreditations, and Licenses

Agency	Web Site	Number
Alaska DEH	http://dec.alaska.gov/eh/lab/cs/csapproval.htm	UST-040
Arizona DHS	http://www.azdhs.gov/lab/license/env.htm	AZ0339
Arkansas - DEQ	http://www.adeq.state.ar.us/techsvs/labcert.htm	88-0637
California DHS (ELAP)	http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx	2795
DOD ELAP	http://www.denix.osd.mil/edqw/Accreditation/AccreditedLabs.cfm	L16-58-R4
Florida DOH	http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm	E87412
Hawaii DOH	http://health.hawaii.gov/	-
ISO 17025	http://www.pjlabs.com/	L16-57
Louisiana DEQ	http://www.deq.louisiana.gov/page/la-lab-accreditation	03016
Maine DHS	http://www.maine.gov/dhhs/	WA01276
Minnesota DOH	http://www.health.state.mn.us/accreditation	053-999-457
Nevada DEP	http://ndep.nv.gov/bsdw/labservice.htm	WA01276
New Jersey DEP	http://www.nj.gov/dep/enforcement/oqa.html	WA005
New York - DOH	https://www.wadsworth.org/regulatory/elap	12060
North Carolina DEQ	https://deq.nc.gov/about/divisions/water-resources/water-resources-data/water-sciences-home-page/laboratory-certification-branch/non-field-lab-certification	605
Oklahoma DEQ	http://www.deq.state.ok.us/CSDnew/labcert.htm	9801
Oregon – DEQ (NELAP)	http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	WA100010
South Carolina DHEC	http://www.scdhec.gov/environment/EnvironmentalLabCertification/	61002
Texas CEQ	http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html	T104704427
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C544
Wyoming (EPA Region 8)	https://www.epa.gov/region8-waterops/epa-region-8-certified-drinking-water-	-
Kelso Laboratory Website	www.alsglobal.com	NA

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. A complete listing of specific NELAP-certified analytes, can be found in the certification section at www.ALSGlobal.com or at the accreditation bodies web site.
Please refer to the certification and/or accreditation body's web site if samples are submitted for compliance purposes. The states highlighted above, require the analysis be listed on the state certification if used for compliance purposes and if the method/anlayte is offered by that state.

Case Narrative

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

1317 South 13th Ave, Kelso, WA 98626 | 1-360-577-7222 | www.alsglobal.com

ALS Environmental

Client: ALS Environmental - US
Project: HS20011311
Sample Matrix: Water

Service Request: K2000907
Date Received: 01/31/2020

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:

One water sample was received for analysis at ALS Environmental on 01/31/2020. Any discrepancies upon initial sample inspection are annotated on the sample receipt and preservation form included within this report. The sample was stored at minimum in accordance with the analytical method requirements.

General Chemistry:

No significant anomalies were noted with this analysis.

Approved by Noe D. Diaz Date 02/05/2020

Chain of Custody

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www.alsglobal.com

ALS Cost.

10450 Stancliff Rd, Ste 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID:** **13217**

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:	
Email:	

INVOICE INFORMATION:

Company:	ALS Houston
Contact:	Accounts Payable
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Reference:	HS20011311
TSR:	Danielle Winnings

K 2000907

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS20011311-01**	**LH18/24-SP650_012820**	**Water**	**28 Jan 2020 14:00**
	TOC Analysis for DOD Level IV			06 Feb 2020

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. Modashia Date/Time: 01/30/2020 18:00

Received By: [signature] Date/Time: 1/31/2020 0920

Cooler ID(s): Temperature(s):

PC KL

Cooler Receipt and Preservation Form

Client ALS Houston Service Request K20 00907

Received: 1/31/2020 Opened: 1/31/2020 By: CG Unloaded: 1/31/2020 By: CG

1. Samples were received via? *USPS* (*Fed Ex*) *UPS* *DHL* *PDX* *Courier* *Hand Delivered*
2. Samples were received in: (circle) (*Cooler*) *Box* *Envelope* *Other* _____ *NA*
3. Were custody seals on coolers? NA (Y) N If yes, how many and where? 2 Front
   If present, were custody seals intact? (Y) N If present, were they signed and dated? (Y) N

Raw Cooler Temp	Corrected Cooler Temp	Raw Temp Blank	Corrected Temp Blank	Corr. Factor	Thermometer ID	Cooler/COC ID NA	Tracking Number NA	File
-0.3	-0.3	1.0	1.0	0.0	385	13219	1251 0294 1691	

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

Sample ID on Bottle	Sample ID on COC	Identified by:

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

Notes, Discrepancies, & Resolutions: _____

RUSH

General Chemistry

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
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www.alsglobal.com

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	K2000907
Project:	HS20011311	**Date Collected:**	01/28/20
Sample Matrix:	Water	**Date Received:**	01/31/20
Analysis Method:	SM 5310 C	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA

Carbon, Total Organic

Sample Name	Lab Code	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
LH18/24-SP650_012820	K2000907-001	**2.20**	0.50	0.20	0.07	1	02/01/20 17:09	
Method Blank	K2000907-MB	ND U	0.50	0.20	0.07	1	02/01/20 16:25	

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	K2000907
Project	HS20011311	**Date Collected:**	01/28/20
Sample Matrix:	Water	**Date Received:**	01/31/20
		Date Analyzed:	02/01/20

Replicate Sample Summary
General Chemistry Parameters

Sample Name:	LH18/24-SP650_012820	**Units:**	mg/L
Lab Code:	K2000907-001	**Basis:**	NA

Analyte Name	Analysis Method	LOQ	LOD	MDL	Sample Result	Duplicate Sample K2000907-001DUP Result	Average	RPD	RPD Limit
Carbon, Total Organic	SM 5310 C	0.50	0.20	0.07	2.20	2.20	2.20	<1	10

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

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

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

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	K2000907
Project:	HS20011311	**Date Collected:**	01/28/20
Sample Matrix:	Water	**Date Received:**	01/31/20
		Date Analyzed:	02/1/20
		Date Extracted:	NA

Matrix Spike Summary
Carbon, Total Organic

Sample Name:	LH18/24-SP650_012820	**Units:**	mg/L
Lab Code:	K2000907-001	**Basis:**	NA
Analysis Method:	SM 5310 C		
Prep Method:	None		

Matrix Spike
K2000907-001MS

Analyte Name	Sample Result	Result	Spike Amount	% Rec	% Rec Limits
Carbon, Total Organic	2.20	29.5	25.0	109	83-117

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

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

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

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	K2000907
Project:	HS20011311	**Date Analyzed:**	02/01/20
Sample Matrix:	Water	**Date Extracted:**	NA

Lab Control Sample Summary
Carbon, Total Organic

Analysis Method:	SM 5310 C	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA
		Analysis Lot:	668606

Sample Name	Lab Code	Result	Spike Amount	% Rec	% Rec Limits
Lab Control Sample	K2000907-LCS	25.9	25.0	104	83-117

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US **Service Request:** K2000907
Project: HS20011311

Continuing Calibration Verification (CCV) Summary

Carbon, Total Organic

Analysis Method: SM 5310 C **Units:** mg/L

	Analysis Lot	Lab Code	Date Analyzed	True Value	Measured Value	Percent Recovery	Acceptance Limits
CCV1	668606	KQ2001488-01	02/01/20 15:55	25.0	25.2	101	90-110
CCV2	668606	KQ2001488-02	02/01/20 19:58	25.0	25.0	100	90-110
CCV3	668606	KQ2001488-03	02/01/20 23:44	25.0	25.0	100	90-110

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US **Service Request:**K2000907
Project: HS20011311

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	668606	KQ2001488-04	02/01/20 16:10	0.50	0.20	0.07	ND	U
CCB2	668606	KQ2001488-05	02/01/20 20:13	0.50	0.20	0.07	ND	U
CCB3	668606	KQ2001488-06	02/01/20 23:59	0.50	0.20	0.07	ND	U

Raw Data

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General Chemistry

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Work Request # Original ( ) K2000866, 888, 907, 934

Tier: II IV IV II

Date Analyzed: 2/1/20

Analyst: BCP

Run # 668606

Analysis: TOC

DATA QUALITY REPORT
INORGANICS

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

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

COMMENTS:

Final Approved by: [signature] Date: 02/04/20

DQREPORT

C:\Documents and Settings\adam.bradbury\My Documents\DATAQUAL.DOC

Analytical Results Summary

00969137

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 668606 **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
K2000866-001	Carbon, Total Organic	N/A		Water	0.54 mg/L	10 mL	0.54 mg/L	1	0.07	0.50			2/1/20 18:34:00	N	II
K2000866-002	Carbon, Total Organic	N/A		Water	1.20 mg/L	10 mL	1.20 mg/L	1	0.07	0.50			2/1/20 19:02:00	N	II
K2000866-003	Carbon, Total Organic	N/A		Water	1.17 mg/L	10 mL	1.17 mg/L	1	0.07	0.50			2/1/20 19:30:00	N	II
K2000866-004	Carbon, Total Organic	N/A		Water	0.90 mg/L	10 mL	0.90 mg/L	1	0.07	0.50			2/1/20 20:27:00	N	II
K2000866-005	Carbon, Total Organic	N/A		Water	0.91 mg/L	10 mL	0.91 mg/L	1	0.07	0.50			2/1/20 20:56:00	N	II
K2000866-006	Carbon, Total Organic	N/A		Water	0.56 mg/L	10 mL	0.56 mg/L	1	0.07	0.50			2/1/20 21:24:00	N	II
K2000866-007	Carbon, Total Organic	N/A		Water	0.50 mg/L	10 mL	0.50 mg/L	1	0.07	0.50			2/1/20 21:52:00	N	II
K2000866-008	Carbon, Total Organic	N/A		Water	0.70 mg/L	10 mL	0.70 mg/L	1	0.07	0.50			2/1/20 22:20:00	N	II
K2000866-009	Carbon, Total Organic	N/A		Water	0.87 mg/L	10 mL	0.87 mg/L	1	0.07	0.50			2/1/20 22:48:00	N	II
K2000888-001	Carbon, Total Organic	N/A		Water	0.07 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			2/1/20 23:16:00	N	IV
K2000907-001	Carbon, Total Organic	N/A		Water	2.20 mg/L	10 mL	2.20 mg/L	1	0.07	0.50			2/1/20 17:09:00	N	IV
K2000934-001	Carbon, Total Organic	N/A		Water	0.66 mg/L	10 mL	0.66 mg/L	1	0.07	0.50			2/1/20 18:06:00	N	II
KQ2001488-01	Carbon, Total Organic	CCV		Water	25.24 mg/L	10 mL	25.2 mg/L	1					2/1/20 15:55:00	N	IV
KQ2001488-02	Carbon, Total Organic	CCV		Water	25.04 mg/L	10 mL	25.0 mg/L	1					2/1/20 19:58:00	N	IV
KQ2001488-03	Carbon, Total Organic	CCV		Water	24.96 mg/L	10 mL	25.0 mg/L	1					2/1/20 23:44:00	N	IV
KQ2001488-04	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			2/1/20 16:10:00	N	IV
KQ2001488-05	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			2/1/20 20:13:00	N	IV
KQ2001488-06	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			2/1/20 23:59:00	N	IV
KQ2001488-07	Carbon, Total Organic	MB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			2/1/20 16:25:00	N	IV
KQ2001488-08	Carbon, Total Organic	LCS		Water	25.92 mg/L	10 mL	25.9 mg/L	1	0.07	0.50	104		2/1/20 16:39:00	N	IV
KQ2001488-09	Carbon, Total Organic	MS	K2000907-001	Water	29.48 mg/L	10 mL	29.5 mg/L	1	0.07	0.50	109		2/1/20 17:37:00	N	IV
KQ2001488-10	Carbon, Total Organic	DUP	K2000866-002	Water	1.21 mg/L	10 mL	1.21 mg/L	1	0.07	0.50		<1	2/1/20 19:02:00	N	II
KQ2001488-11	Carbon, Total Organic	DUP	K2000866-001	Water	0.51 mg/L	10 mL	0.51 mg/L	1	0.07	0.50		6	2/1/20 18:34:00	N	II
KQ2001488-12	Carbon, Total Organic	DUP	K2000866-003	Water	1.16 mg/L	10 mL	1.16 mg/L	1	0.07	0.50		1	2/1/20 19:30:00	N	II
KQ2001488-13	Carbon, Total Organic	DUP	K2000866-004	Water	0.85 mg/L	10 mL	0.85 mg/L	1	0.07	0.50		5	2/1/20 20:27:00	N	II
KQ2001488-14	Carbon, Total Organic	DUP	K2000866-005	Water	0.91 mg/L	10 mL	0.91 mg/L	1	0.07	0.50		<1	2/1/20 20:56:00	N	II
KQ2001488-15	Carbon, Total Organic	DUP	K2000866-006	Water	0.57 mg/L	10 mL	0.57 mg/L	1	0.07	0.50		3	2/1/20 21:24:00	N	II
KQ2001488-16	Carbon, Total Organic	DUP	K2000866-007	Water	0.50 mg/L	10 mL	0.50 mg/L	1	0.07	0.50		<1	2/1/20 21:52:00	N	II
KQ2001488-17	Carbon, Total Organic	DUP	K2000866-008	Water	0.68 mg/L	10 mL	0.68 mg/L	1	0.07	0.50		2	2/1/20 22:20:00	N	II
KQ2001488-18	Carbon, Total Organic	DUP	K2000866-009	Water	0.87 mg/L	10 mL	0.87 mg/L	1	0.07	0.50		<1	2/1/20 22:48:00	N	II
KQ2001488-19	Carbon, Total Organic	DUP	K2000888-001	Water	0.04 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	2/1/20 23:16:00	N	IV
KQ2001488-20	Carbon, Total Organic	DUP	K2000907-001	Water	2.20 mg/L	10 mL	2.20 mg/L	1	0.07	0.50		<1	2/1/20 17:09:00	N	IV
KQ2001488-21	Carbon, Total Organic	DUP	K2000934-001	Water	0.64 mg/L	10 mL	0.64 mg/L	1	0.07	0.50		2	2/1/20 18:06:00	N	II

02/04/20

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

TOC; 668606

Schedule: 02012020

Version: 2
Instrument: Fusion1
Last Saved by: Fusion1 (Fusion1)
Last Saved on: 2020/02/01 14:01 - Saturday

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)	1	True	Ready
C	Check Standard	[TOC] LCS [24.0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
2	Sample	ICS	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
3	Sample	K2000907-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
4	Sample	K2000907-001.01 ms	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
5	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
6	Sample	K2000934-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
7	Sample	K2000866-001.06	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
8	Sample	K2000866-002.06	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
9	Sample	K2000866-003.06	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
10	Sample	K2000866-004.06	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
11	Sample	K2000866-005.06	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
12	Sample	K2000866-006.06	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
13	Sample	K2000866-007.06	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
14	Sample	K2000866-008.06	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
15	Sample	K2000866-009.06	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
16	Sample	K2000888-001.01	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
					False	

02/04/20

Fusion Report - 02012020
Saturday, February 01, 2020 02:01 PM

(View - Reps, Unused Reps, Meta-Data, Signature, History)
Printed on 2020/02/04 12:56 - Tuesday

Report Summary Information

Company Location:	Gen Chem Lab		
Schedule Name:	02012020	Engine Version:	1.1.5.1
Instrument Name:	Fusion1	Firmware Version:	1.2.0696
Report Version:	1 of 1	Connection:	RS232 COM1
Report Creation by Operators (schedule version):	Fusion1 (Fusion1) (v2)		
Comment:			

Report Results

02/04/20

Sample Type: Clean — From Schedule Version 2

	Pos	Analysis Type	Sample ID	Start Time
◆	(clean)		Clean	2020/02/01 14:01

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	12.44	17.59	5.15	49.63	05:25
2	TC Clean	5.57	9.31	3.74	50.09	04:02
3	TC Clean	2.95	6.76	3.81	50.09	03:54
4	TC Clean	2.10	5.97	3.87	50.12	03:58

Sample Type: Clean — From Schedule Version 2

	Pos	Analysis Type	Sample ID	Start Time
◆	(clean)		Clean	2020/02/01 14:23

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	0.86	4.59	3.73	49.40	05:20
2	TC Clean	5.63	9.48	3.85	50.04	04:02
3	TC Clean	2.55	6.47	3.92	50.10	03:48
4	TC Clean	2.40	5.96	3.57	50.02	03:54

Sample Type: Clean From Schedule Version 2

	Pos	Analysis Type	Sample ID	Start Time
◆	(clean)		Clean	2020/02/01 14:45

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	0.61	4.44	3.83	49.57	05:21
2	TC Clean	5.33	9.04	3.71	49.94	04:00
3	TC Clean	2.26	6.27	4.01	50.10	03:46
4	TC Clean	1.94	5.92	3.98	50.12	03:43

Sample Type: Blank (Creating v1346) From Schedule Version 2

	Pos	Analysis Type	Sample ID	Start Time
◆	(blank)		Reagent/Acid Blank	2020/02/01 15:07

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	0.84	4.73	3.89	49.54	05:10
2	TC Clean	5.12	9.07	3.95	50.11	04:02
3	TC Clean	2.30	6.19	3.90	49.94	03:46
4	TC Clean	2.24	6.20	3.96	50.12	03:48
5	Reagent Blank	5.22	9.23	4.01	50.07	05:02
6	Acid Blank	1.07	4.85	3.78	49.49	05:30

Sample Type: Sample From Schedule Version 2

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	D	TOC	RB	0.2145 ppm	0.0000 ppm	0.0000%	2020/02/01 15:40

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.2145	2.1448	10.88	14.82	3.94	50.14	10:34

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5279 (IC) (v1346)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 2

	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)	25.2374 ppm (PASS)	0.0000 ppm	0%	2020/02/01 15:55

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	25.2374	252.3744	169.77	173.66	3.89	50.19	10:33

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)	50 ppmC

Sample Type: Check Standard --> CCB From Schedule Version 2

	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%	2020/02/01 16:10

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	7.62	11.54	3.92	50.18	10:28

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)	0 ppmC

Sample Type: Sample From Schedule Version 2

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	1	TOC	MB1	0.0000 ppm	0.0000 ppm	0.0000%	2020/02/01 16:25

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.89	10.66	3.77	50.21	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5279 (IC) (v1346)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

Sample Type: Check Standard --> LCS From Schedule Version 2

	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)	25.9215 ppm (PASS)	0.0000 ppm	0%	2020/02/01 16:39

Pos	Base Analysis	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time

	Type									
C	TOC	25.0 ppm	1	25.9215	259.2147	174.10	177.88	3.78	50.23	10:32

Completion State	Success Action	Method	Calibration	STD Conc - Pos C
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)	25 ppmC

Sample Type: Sample From Schedule Version 2

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	2	TOC	ICS	0.1675 ppm	0.0000 ppm	0.0000%	2020/02/01 16:54

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.1675	1.6750	10.59	14.57	3.98	50.20	10:32

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5279 (IC) (v1346)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	3	TOC	K2000907-001.01	2.2047 ppm	0.0224 ppm	1.0100%	2020/02/01 17:09

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.2205	22.2054	23.57	27.39	3.83	50.21	10:27
2	TOC	2.1889	21.8891	23.37	27.26	3.89	50.25	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5279 (IC) (v1346)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	4	TOC	K2000907-001.01 ms	29.2817 ppm	0.0000 ppm	0.0000%	2020/02/01 17:37

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	29.2817	292.8169	194.67	198.45	3.78	50.22	10:33

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5279 (IC) (v1346)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	5	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2020/02/01 17:51

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.78	11.63	3.85	50.27	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5279 (IC) (v1346)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	6	TOC	K2000934-001.01	0.6507 ppm	0.0110 ppm	1.6800%	2020/02/01 18:06

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.6584	6.5842	13.69	17.54	3.85	50.25	10:28
2	TOC	0.6429	6.4292	13.59	17.41	3.82	50.25	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5279 (IC) (v1346)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	7	TOC	K2000866-001.06	0.5223 ppm	0.0215 ppm	4.1100%	2020/02/01 18:34

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.5374	5.3743	12.93	16.72	3.79	50.25	10:28
2	TOC	0.5071	5.0707	12.73	16.57	3.84	50.27	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5279 (IC) (v1346)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	8	TOC	K2000866-002.06	1.2045 ppm	0.0016 ppm	0.1300%	2020/02/01 19:02

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.2034	12.0343	17.14	21.01	3.88	50.25	10:27
2	TOC	1.2056	12.0565	17.15	20.83	3.68	50.26	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5279 (IC) (v1346)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	9	TOC	K2000866-003.06	1.1647 ppm	0.0101 ppm	0.8600%	2020/02/01 19:30

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.1718	11.7180	16.94	20.53	3.59	50.25	10:29
2	TOC	1.1576	11.5757	16.85	20.30	3.45	50.26	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5279 (IC) (v1346)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 2

	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)	25.0401 ppm	0.0000 ppm	0%	2020/02/01 19:58

						(PASS)				

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	25.0401	250.4006	168.52	172.13	3.61	50.26	10:30

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)	50 ppmC

Sample Type: Check Standard --> CCB From Schedule Version 2

	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%	2020/02/01 20:13

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	7.18	10.90	3.72	50.27	10:34

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)	0 ppmC

Sample Type: Sample From Schedule Version 2

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	10	TOC	K2000866-004.06	0.8771 ppm	0.0337 ppm	3.8400%	2020/02/01 20:27

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.9009	9.0088	15.22	18.95	3.72	50.25	10:32
2	TOC	0.8533	8.5327	14.92	18.55	3.63	50.25	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5279 (IC) (v1346)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	11	TOC	K2000866-005.06	0.9101 ppm	0.0020 ppm	0.2200%	2020/02/01 20:56

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.9086	9.0863	15.27	18.99	3.72	50.27	10:25
2	TOC	0.9115	9.1147	15.29	18.96	3.67	50.26	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5279 (IC) (v1346)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis	Sample ID	Result (ppmC)	Std. Dev.	RSD	Start Time

		Type			(ppmC)		
◆	12	TOC	K2000866-006.06	0.5651 ppm	0.0103 ppm	1.8200%	2020/02/01 21:24

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.5578	5.5784	13.06	16.80	3.75	50.24	10:28
2	TOC	0.5724	5.7239	13.15	16.96	3.81	50.27	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5279 (IC) (v1346)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	13	TOC	K2000866-007.06	0.5022 ppm	0.0015 ppm	0.2900%	2020/02/01 21:52

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.5033	5.0327	12.71	16.41	3.70	50.27	10:25
2	TOC	0.5012	5.0122	12.70	16.44	3.74	50.27	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5279 (IC) (v1346)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	14	TOC	K2000866-008.06	0.6916 ppm	0.0104 ppm	1.5000%	2020/02/01 22:20

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.6989	6.9891	13.95	17.67	3.72	50.26	10:30
2	TOC	0.6842	6.8420	13.85	17.58	3.72	50.26	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5279 (IC) (v1346)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	15	TOC	K2000866-009.06	0.8736 ppm	0.0019 ppm	0.2200%	2020/02/01 22:48

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.8749	8.7494	15.06	18.84	3.78	50.28	10:28
2	TOC	0.8723	8.7225	15.04	18.80	3.75	50.26	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.5279 (IC) (v1346)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	16	TOC	K2000888-001.01	0.0539 ppm	0.0168 ppm	31.1000%	2020/02/01 23:16

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0658	0.6581	9.94	13.65	3.70	50.28	10:26
2	TOC	0.0421	0.4209	9.79	13.62	3.82	50.28	10:27

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 2

	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)	24.9583 ppm (PASS)	0.0000 ppm	0%	2020/02/01 23:44

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.9583	249.5829	168.01	171.85	3.84	50.26	10:32

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)	50 ppmC

Sample Type: Check Standard --> CCB From Schedule Version 2

	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%	2020/02/01 23:59

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	6.62	10.40	3.78	50.27	10:29

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)	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
v1345	1.9953	1.4740	0.0000	0.0000	0.0000	2020/01/30 22:05	Fusion1 (Fusion1)
v1346	1.7393	1.0730	0.0000	0.0000	0.0000	2020/02/01 15:40	Fusion1 (Fusion1)

Calibrations

Name: CAS_salt_010711 (TOC)

Version:	v31	Calibration curve formula:	TOC: y = 6.323x + 10.200
Ver Creation:	2020/01/07 14:30	r^2 value:	TOC: r^2 = 0.99991
Comment:			
Operator:	Fusion1 (Fusion1)		
Basic Analysis Type	TOC		

Basic Analysis Type: TOC

Sample ID	Y Raw Value	X Expected	Message	End Time
DI Water	9.5850	0.0000		2020/01/07 13:02
0.500 ppm	12.6160	0.5000		2020/01/07 13:17
1.0 ppm	15.6440	1.0000		2020/01/07 13:31
5.0 ppm	43.7700	5.0000		2020/01/07 13:45
10 ppm	73.2770	10.0000		2020/01/07 14:00
25 ppm	169.4210	25.0000		2020/01/07 14:14
50 ppm	325.6260	50.0000		2020/01/07 14:28

Methods

Name: CAS_salt_010711 (TOC)

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

Parameter	Value
SampleVolume	10.0 mL
Dilution	1:10
AcidVolume	0.5 ml
ReagentVolume	2.0 ml
UVReactorPrerinse	Off
UVReactorPrerinseVolume	5.0
NumberOfUVReactorPrerinses	1
ICSpargeTime	1.00 mins
DetectorSweepFlow	500 ml/min
PreSpargeTime	2.00 mins
SystemFlow	500 ml/min

Advanced Parameter	Value
NeedleRinseVolume	5.0 ml
VialPrimeVolume	2.0 ml
ICSamplePrimeVolume	2.0 ml
ICSpargeRinseVolume	12.0 ml
BaselineStabilizeTime	0.70 min
DetectorPressureFlow	150 ml/min
SyringeSpeedWaste	10
SyringeSpeedAcid	7
SyringeSpeedReagent	7
SyringeSpeedDIWater	7
NDIRPressurization	60 psig
SyringeSpeedSampleDispense	5
SyringeSpeedSampleAspirate	4
SyringeSpeedUVDispense	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	2020/02/02 00:14

ALS Environmental

StarLIMS Run: 668606

Analysis: DOC/TOC

Method: SM 5310 C, 9060A, 415.1, 9060

CCV: 11-GEN-05-82C 50 ppm LCS: 11-GEN-05-79J 25.0 ppm

ICAL Date: 1/7/2020

ICAL ID: 11-GEN-05-83-K->O/84-A/11-GEN-05-84-C->H

ICS ID: 11-GEN-05-78M

ICS TV: 25.0 ppm ICS % R < 1

Spike ID: 11-GEN-05-82C 0.05 ml of 5000 ppm stock ---> 10.0 ml = 25.0 ppm x dilution factor

Sodium Persulfate: 19-GEN-08-2-M

21 % H3PO4: 19-GEN-08-2-L

Equipment ID: K-TOC-03

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

FILTER ID: 16967789

Analyzed By: BCP	Date Analyzed: 2/1/20
Reviewed By:	Date Reviewed: 02/04/20

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
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January 30, 2020

Marcia Olive
Bhate Environmental Associates, Inc.
445 Union Blvd Ste 129
Lakewood, CO 80228

Work Order: **HS20011312**

Laboratory Results for: **Longhorn GW Treatment Plant Special Samples**

Dear Marcia,

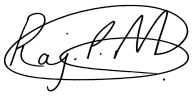
ALS Environmental received 2 sample(s) on Jan 29, 2020 for the analysis presented in the following report.

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-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Special Samples
Work Order: HS20011312

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS20011312-01	LH18/24-SP650_012820	Water		28-Jan-2020 14:00	29-Jan-2020 08:26	☐
HS20011312-02	Trip Blank	Water	CG-111519-112	28-Jan-2020 00:00	29-Jan-2020 08:26	☐

ALS Houston, US Date: 30-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Special Samples
Work Order: HS20011312

CASE NARRATIVE

GCMS Volatiles by Method SW8260

Batch ID: R355372

Sample ID: VLCSW-200129

- Hexachlorobutadiene exceeded QC limits for LCS. CCV is OK. Samples are ND for this compound.

Sample ID: HS20011322-01MSD

- MS/MSD RPD is for an urnelated sample

ALS Houston, US Date: 30-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Special Samples
Sample ID: LH18/24-SP650_012820
Collection Date: 28-Jan-2020 14:00

ANALYTICAL REPORT
WorkOrder:HS20011312
Lab ID:HS20011312-01
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	29-Jan-2020 14:31
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	29-Jan-2020 14:31
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	29-Jan-2020 14:31
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	29-Jan-2020 14:31
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	29-Jan-2020 14:31
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	29-Jan-2020 14:31
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	29-Jan-2020 14:31
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	29-Jan-2020 14:31
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	29-Jan-2020 14:31
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	29-Jan-2020 14:31
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	29-Jan-2020 14:31
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	29-Jan-2020 14:31
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	29-Jan-2020 14:31
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	29-Jan-2020 14:31
1,2-Dichloroethane	**1.3**		**0.20**	**0.50**	**1.0**	**UG/L**	1	29-Jan-2020 14:31
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	29-Jan-2020 14:31
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	29-Jan-2020 14:31
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	29-Jan-2020 14:31
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	29-Jan-2020 14:31
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	29-Jan-2020 14:31
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	29-Jan-2020 14:31
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	29-Jan-2020 14:31
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	29-Jan-2020 14:31
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	29-Jan-2020 14:31
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	29-Jan-2020 14:31
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	29-Jan-2020 14:31
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	29-Jan-2020 14:31
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	29-Jan-2020 14:31
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	29-Jan-2020 14:31
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	29-Jan-2020 14:31
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	29-Jan-2020 14:31
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	29-Jan-2020 14:31
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	29-Jan-2020 14:31
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	29-Jan-2020 14:31
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	29-Jan-2020 14:31
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	29-Jan-2020 14:31
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	29-Jan-2020 14:31
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	29-Jan-2020 14:31
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	29-Jan-2020 14:31

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

ALS Houston, US Date: 30-Jan-20

Client: Bhate Environmental Associates, Inc.
ANALYTICAL REPORT
Project: Longhorn GW Treatment Plant Special Samples
WorkOrder:HS20011312
Sample ID: LH18/24-SP650_012820
Lab ID:HS20011312-01
Collection Date: 28-Jan-2020 14:00
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	29-Jan-2020 14:31
cis-1,2-Dichloroethene	**27**		**0.20**	**0.50**	**1.0**	**UG/L**	1	29-Jan-2020 14:31
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	29-Jan-2020 14:31
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	29-Jan-2020 14:31
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	29-Jan-2020 14:31
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	29-Jan-2020 14:31
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	29-Jan-2020 14:31
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	29-Jan-2020 14:31
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	29-Jan-2020 14:31
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	29-Jan-2020 14:31
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	29-Jan-2020 14:31
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	29-Jan-2020 14:31
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	29-Jan-2020 14:31
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	29-Jan-2020 14:31
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	29-Jan-2020 14:31
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	29-Jan-2020 14:31
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	29-Jan-2020 14:31
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	29-Jan-2020 14:31
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	29-Jan-2020 14:31
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	29-Jan-2020 14:31
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	29-Jan-2020 14:31
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	29-Jan-2020 14:31
Trichloroethene	**5.0**		**0.20**	**0.50**	**1.0**	**UG/L**	1	29-Jan-2020 14:31
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	29-Jan-2020 14:31
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	29-Jan-2020 14:31
Surr: 1,2-Dichloroethane-d4	*93.2*			**0**	*81-118*	*%REC*	*1*	*29-Jan-2020 14:31*
Surr: 4-Bromofluorobenzene	*102*			**0**	*85-114*	*%REC*	*1*	*29-Jan-2020 14:31*
Surr: Dibromofluoromethane	*95.9*			**0**	*80-119*	*%REC*	*1*	*29-Jan-2020 14:31*
Surr: Toluene-d8	*110*			**0**	*89-112*	*%REC*	*1*	*29-Jan-2020 14:31*

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

ALS Houston, US Date: 30-Jan-20

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**
Project: Longhorn GW Treatment Plant Special Samples WorkOrder:HS20011312
Sample ID: Trip Blank Lab ID:HS20011312-02
Collection Date: 28-Jan-2020 00:00 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	29-Jan-2020 14:07
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	29-Jan-2020 14:07
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	29-Jan-2020 14:07
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	29-Jan-2020 14:07
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	29-Jan-2020 14:07
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	29-Jan-2020 14:07
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	29-Jan-2020 14:07
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	29-Jan-2020 14:07
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	29-Jan-2020 14:07
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	29-Jan-2020 14:07
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	29-Jan-2020 14:07
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	29-Jan-2020 14:07
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	29-Jan-2020 14:07
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	29-Jan-2020 14:07
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	29-Jan-2020 14:07
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	29-Jan-2020 14:07
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	29-Jan-2020 14:07
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	29-Jan-2020 14:07
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	29-Jan-2020 14:07
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	29-Jan-2020 14:07
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	29-Jan-2020 14:07
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	29-Jan-2020 14:07
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	29-Jan-2020 14:07
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	29-Jan-2020 14:07
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	29-Jan-2020 14:07
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	29-Jan-2020 14:07
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	29-Jan-2020 14:07
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	29-Jan-2020 14:07
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	29-Jan-2020 14:07
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	29-Jan-2020 14:07
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	29-Jan-2020 14:07
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	29-Jan-2020 14:07
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	29-Jan-2020 14:07
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	29-Jan-2020 14:07
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	29-Jan-2020 14:07
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	29-Jan-2020 14:07
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	29-Jan-2020 14:07
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	29-Jan-2020 14:07
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	29-Jan-2020 14:07

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

ALS Houston, US Date: 30-Jan-20

Client: Bhate Environmental Associates, Inc.
ANALYTICAL REPORT
Project: Longhorn GW Treatment Plant Special Samples
WorkOrder:HS20011312
Sample ID: Trip Blank
Lab ID:HS20011312-02
Collection Date: 28-Jan-2020 00:00
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	29-Jan-2020 14:07
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	29-Jan-2020 14:07
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	29-Jan-2020 14:07
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	29-Jan-2020 14:07
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	29-Jan-2020 14:07
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	29-Jan-2020 14:07
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	29-Jan-2020 14:07
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	29-Jan-2020 14:07
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	29-Jan-2020 14:07
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	29-Jan-2020 14:07
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	29-Jan-2020 14:07
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	29-Jan-2020 14:07
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	29-Jan-2020 14:07
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	29-Jan-2020 14:07
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	29-Jan-2020 14:07
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	29-Jan-2020 14:07
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	29-Jan-2020 14:07
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	29-Jan-2020 14:07
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	29-Jan-2020 14:07
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	29-Jan-2020 14:07
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	29-Jan-2020 14:07
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	29-Jan-2020 14:07
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	29-Jan-2020 14:07
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	29-Jan-2020 14:07
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	29-Jan-2020 14:07
Surr: 1,2-Dichloroethane-d4	*94.2*			**0**	*81-118*	*%REC*	*1*	*29-Jan-2020 14:07*
Surr: 4-Bromofluorobenzene	*102*			**0**	*85-114*	*%REC*	*1*	*29-Jan-2020 14:07*
Surr: Dibromofluoromethane	*96.6*			**0**	*80-119*	*%REC*	*1*	*29-Jan-2020 14:07*
Surr: Toluene-d8	*110*			**0**	*89-112*	*%REC*	*1*	*29-Jan-2020 14:07*

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

ALS Houston, US Date: 30-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Special Samples
WorkOrder: HS20011312

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R355372 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Water	
HS20011312-01	LH18/24-SP650_012820	28 Jan 2020 14:00			29 Jan 2020 14:31	1
HS20011312-02	Trip Blank	28 Jan 2020 00:00			29 Jan 2020 14:07	1

ALS Houston, US Date: 30-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Special Samples
WorkOrder: HS20011312

QC BATCH REPORT

Batch ID: R355372 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-200129** Units: **UG/L** Analysis Date: **29-Jan-2020 13:42**
Client ID: Run ID: **VOA6_355372** SeqNo: **5453812** 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-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Special Samples
WorkOrder: HS20011312

QC BATCH REPORT

Batch ID: R355372 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-200129** Units: **UG/L** Analysis Date: **29-Jan-2020 13:42**
Client ID: Run ID: **VOA6_355372** SeqNo: **5453812** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	1.0	2.0								U
Carbon tetrachloride	0.50	1.0								U
Chlorobenzene	0.50	1.0								U
Chloroethane	0.50	1.0								U
Chloroform	0.50	1.0								U
Chloromethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
cis-1,3-Dichloropropene	0.50	1.0								U
Dibromochloromethane	0.50	1.0								U
Dibromomethane	0.50	1.0								U
Dichlorodifluoromethane	0.50	1.0								U
Ethylbenzene	0.50	1.0								U
Hexachlorobutadiene	1.0	1.0								U
Isopropylbenzene	0.50	1.0								U
m,p-Xylene	1.0	2.0								U
Methylene chloride	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	*46.56*	*1.0*	*50*	*0*	*93.1*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*50.85*	*1.0*	*50*	*0*	*102*	*85 - 114*				
Surr: Dibromofluoromethane	*48.83*	*1.0*	*50*	*0*	*97.7*	*80 - 119*				
Surr: Toluene-d8	*55.97*	*1.0*	*50*	*0*	*112*	*89 - 112*				

ALS Houston, US Date: 30-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Special Samples
WorkOrder: HS20011312

QC BATCH REPORT

Batch ID: R355372 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

LCS Sample ID: **VLCSW-200129** Units: **UG/L** Analysis Date: **29-Jan-2020 11:43**
Client ID: Run ID: **VOA6_355372** SeqNo: **5453811** 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	20.82	1.0	20	0	104	78 - 124				
1,1,1-Trichloroethane	20.01	1.0	20	0	100	74 - 131				
1,1,2,2-Tetrachloroethane	19.95	1.0	20	0	99.7	71 - 121				
1,1,2-Trichloroethane	20.31	1.0	20	0	102	80 - 119				
1,1-Dichloroethane	18.85	1.0	20	0	94.2	77 - 125				
1,1-Dichloroethene	18.76	1.0	20	0	93.8	71 - 131				
1,1-Dichloropropene	19.28	1.0	20	0	96.4	78 - 125				
1,2,3-Trichlorobenzene	25.78	1.0	20	0	129	69 - 129				
1,2,3-Trichloropropane	20.5	1.0	20	0	103	73 - 122				
1,2,4-Trichlorobenzene	23.06	1.0	20	0	115	69 - 130				
1,2,4-Trimethylbenzene	20.98	1.0	20	0	105	76 - 124				
1,2-Dibromo-3-chloropropane	21.98	1.0	20	0	110	62 - 128				
1,2-Dibromoethane	20.63	1.0	20	0	103	77 - 121				
1,2-Dichlorobenzene	20.5	1.0	20	0	102	80 - 119				
1,2-Dichloroethane	19.77	1.0	20	0	98.9	73 - 128				
1,2-Dichloropropane	19.06	1.0	20	0	95.3	78 - 122				
1,3,5-Trimethylbenzene	21.24	1.0	20	0	106	75 - 124				
1,3-Dichlorobenzene	20.5	1.0	20	0	103	80 - 119				
1,3-Dichloropropane	19.87	1.0	20	0	99.3	80 - 119				
1,4-Dichlorobenzene	20.64	1.0	20	0	103	79 - 118				
2,2-Dichloropropane	19.68	1.0	20	0	98.4	60 - 139				
2-Butanone	39.63	2.0	40	0	99.1	56 - 143				
2-Chlorotoluene	20.14	1.0	20	0	101	79 - 122				
2-Hexanone	41.16	2.0	40	0	103	57 - 139				
4-Chlorotoluene	20.19	1.0	20	0	101	78 - 122				
4-Isopropyltoluene	20.74	1.0	20	0	104	77 - 127				
4-Methyl-2-pentanone	40.96	2.0	40	0	102	67 - 130				
Acetone	42.18	2.0	40	0	105	39 - 160				
Benzene	19.42	1.0	20	0	97.1	79 - 120				
Bromobenzene	19.98	1.0	20	0	99.9	80 - 120				
Bromochloromethane	18.79	1.0	20	0	93.9	78 - 123				
Bromodichloromethane	19.94	1.0	20	0	99.7	79 - 125				
Bromoform	21.56	1.0	20	0	108	66 - 130				
Bromomethane	22.38	1.0	20	0	112	53 - 141				

ALS Houston, US Date: 30-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Special Samples
WorkOrder: HS20011312

QC BATCH REPORT

Batch ID: R355372 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

LCS Sample ID: **VLCSW-200129** Units: **UG/L** Analysis Date: **29-Jan-2020 11:43**
Client ID: Run ID: **VOA6_355372** SeqNo: **5453811** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	38.36	2.0	40	0	95.9	64 - 133				
Carbon tetrachloride	18.88	1.0	20	0	94.4	72 - 136				
Chlorobenzene	19.92	1.0	20	0	99.6	82 - 118				
Chloroethane	19.07	1.0	20	0	95.3	60 - 138				
Chloroform	17.62	1.0	20	0	88.1	79 - 124				
Chloromethane	18.48	1.0	20	0	92.4	50 - 139				
cis-1,2-Dichloroethene	18.99	1.0	20	0	94.9	78 - 123				
cis-1,3-Dichloropropene	19.78	1.0	20	0	98.9	75 - 124				
Dibromochloromethane	19.93	1.0	20	0	99.7	74 - 126				
Dibromomethane	19.88	1.0	20	0	99.4	79 - 123				
Dichlorodifluoromethane	18.86	1.0	20	0	94.3	32 - 152				
Ethylbenzene	20.52	1.0	20	0	103	79 - 121				
Hexachlorobutadiene	27.08	1.0	20	0	135	66 - 134				S
Isopropylbenzene	21.24	1.0	20	0	106	72 - 131				
m,p-Xylene	41.19	2.0	40	0	103	80 - 121				
Methylene chloride	18.8	2.0	20	0	94.0	74 - 124				
Naphthalene	22.85	1.0	20	0	114	61 - 128				
n-Butylbenzene	21.02	1.0	20	0	105	75 - 128				
n-Propylbenzene	21.19	1.0	20	0	106	76 - 126				
o-Xylene	20.58	1.0	20	0	103	78 - 122				
sec-Butylbenzene	21.94	1.0	20	0	110	77 - 126				
Styrene	20.36	1.0	20	0	102	78 - 123				
tert-Butylbenzene	21.86	1.0	20	0	109	78 - 124				
Tetrachloroethene	20.95	1.0	20	0	105	74 - 129				
Toluene	20.23	1.0	20	0	101	80 - 121				
trans-1,2-Dichloroethene	19.04	1.0	20	0	95.2	75 - 124				
trans-1,3-Dichloropropene	20.15	1.0	20	0	101	73 - 127				
Trichloroethene	19.06	1.0	20	0	95.3	79 - 123				
Trichlorofluoromethane	20.23	1.0	20	0	101	65 - 141				
Vinyl chloride	18.54	1.0	20	0	92.7	58 - 137				
Surr: 1,2-Dichloroethane-d4	*51.39*	*1.0*	*50*	*0*	*103*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*51.05*	*1.0*	*50*	*0*	*102*	*85 - 114*				
Surr: Dibromofluoromethane	*51.12*	*1.0*	*50*	*0*	*102*	*80 - 119*				
Surr: Toluene-d8	*52.3*	*1.0*	*50*	*0*	*105*	*89 - 112*				

ALS Houston, US Date: 30-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Special Samples
WorkOrder: HS20011312

QC BATCH REPORT

Batch ID: R355372 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MS Sample ID: **HS20011322-01MS** Units: **UG/L** Analysis Date: **29-Jan-2020 15:43**
Client ID: Run ID: **VOA6_355372** SeqNo: **5453816** 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	20.06	1.0	20	0	100	78 - 124				
1,1,1-Trichloroethane	20	1.0	20	0	100.0	74 - 131				
1,1,2,2-Tetrachloroethane	18.56	1.0	20	0	92.8	71 - 121				
1,1,2-Trichloroethane	19.4	1.0	20	0	97.0	80 - 119				
1,1-Dichloroethane	18.33	1.0	20	0	91.7	77 - 125				
1,1-Dichloroethene	18.52	1.0	20	0	92.6	71 - 131				
1,1-Dichloropropene	19.69	1.0	20	0	98.5	78 - 125				
1,2,3-Trichlorobenzene	14.01	1.0	20	0	70.1	69 - 129				
1,2,3-Trichloropropane	18.5	1.0	20	0	92.5	73 - 122				
1,2,4-Trichlorobenzene	15.28	1.0	20	0	76.4	69 - 130				
1,2,4-Trimethylbenzene	20.11	1.0	20	0	101	76 - 124				
1,2-Dibromo-3-chloropropane	17.47	1.0	20	0	87.3	62 - 128				
1,2-Dibromoethane	19.33	1.0	20	0	96.6	77 - 121				
1,2-Dichlorobenzene	18.99	1.0	20	0	95.0	80 - 119				
1,2-Dichloroethane	18.73	1.0	20	0	93.6	73 - 128				
1,2-Dichloropropane	18.32	1.0	20	0	91.6	78 - 122				
1,3,5-Trimethylbenzene	20.48	1.0	20	0	102	75 - 124				
1,3-Dichlorobenzene	19.64	1.0	20	0	98.2	80 - 119				
1,3-Dichloropropane	18.71	1.0	20	0	93.6	80 - 119				
1,4-Dichlorobenzene	19.3	1.0	20	0	96.5	79 - 118				
2,2-Dichloropropane	19.28	1.0	20	0	96.4	60 - 139				
2-Butanone	34.74	2.0	40	0	86.9	56 - 143				
2-Chlorotoluene	20.04	1.0	20	0	100	79 - 122				
2-Hexanone	36.12	2.0	40	0	90.3	57 - 139				
4-Chlorotoluene	20.11	1.0	20	0	101	78 - 122				
4-Isopropyltoluene	18.48	1.0	20	0	92.4	77 - 127				
4-Methyl-2-pentanone	37.19	2.0	40	0	93.0	67 - 130				
Acetone	42.69	2.0	40	11.93	76.9	39 - 160				
Benzene	24.56	1.0	20	5.556	95.0	79 - 120				
Bromobenzene	19.97	1.0	20	0	99.9	80 - 120				
Bromochloromethane	17.78	1.0	20	0	88.9	78 - 123				
Bromodichloromethane	18.84	1.0	20	0	94.2	79 - 125				
Bromoform	19.24	1.0	20	0	96.2	66 - 130				
Bromomethane	17.9	1.0	20	0	89.5	53 - 141				

ALS Houston, US Date: 30-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Special Samples
WorkOrder: HS20011312

QC BATCH REPORT

Batch ID: R355372 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MS Sample ID: **HS20011322-01MS** Units: **UG/L** Analysis Date: **29-Jan-2020 15:43**
Client ID: Run ID: **VOA6_355372** SeqNo: **5453816** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	35.49	2.0	40	0	88.7	64 - 133				
Carbon tetrachloride	19.5	1.0	20	0	97.5	72 - 136				
Chlorobenzene	20.03	1.0	20	0	100	82 - 118				
Chloroethane	16.82	1.0	20	0	84.1	60 - 138				
Chloroform	17.59	1.0	20	0	88.0	79 - 124				
Chloromethane	12.12	1.0	20	0	60.6	50 - 139				
cis-1,2-Dichloroethene	18.92	1.0	20	0	94.6	78 - 123				
cis-1,3-Dichloropropene	18.56	1.0	20	0	92.8	75 - 124				
Dibromochloromethane	19.34	1.0	20	0	96.7	74 - 126				
Dibromomethane	18.72	1.0	20	0	93.6	79 - 123				
Dichlorodifluoromethane	8.083	1.0	20	0	40.4	32 - 152				
Ethylbenzene	21.07	1.0	20	0	105	79 - 121				
Hexachlorobutadiene	13.68	1.0	20	0	68.4	66 - 134				
Isopropylbenzene	20.51	1.0	20	0	103	72 - 131				
m,p-Xylene	44.1	2.0	40	3.167	102	80 - 121				
Methylene chloride	18.08	2.0	20	0	90.4	74 - 124				
Naphthalene	15	1.0	20	0	75.0	61 - 128				
n-Butylbenzene	17.6	1.0	20	0	88.0	75 - 128				
n-Propylbenzene	20.63	1.0	20	0	103	76 - 126				
o-Xylene	22.69	1.0	20	1.891	104	78 - 122				
sec-Butylbenzene	19.88	1.0	20	0	99.4	77 - 126				
Styrene	20.23	1.0	20	0	101	78 - 123				
tert-Butylbenzene	20.31	1.0	20	0	102	78 - 124				
Tetrachloroethene	22.04	1.0	20	0	110	74 - 129				
Toluene	21.73	1.0	20	1.14	103	80 - 121				
trans-1,2-Dichloroethene	19.35	1.0	20	0	96.8	75 - 124				
trans-1,3-Dichloropropene	18.33	1.0	20	0	91.7	73 - 127				
Trichloroethene	19.58	1.0	20	0	97.9	79 - 123				
Trichlorofluoromethane	19.76	1.0	20	0	98.8	65 - 141				
Vinyl chloride	14.94	1.0	20	0.4067	72.7	58 - 137				
Surr: 1,2-Dichloroethane-d4	*47.87*	*1.0*	*50*	*0*	*95.7*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*50.83*	*1.0*	*50*	*0*	*102*	*85 - 114*				
Surr: Dibromofluoromethane	*48.93*	*1.0*	*50*	*0*	*97.9*	*80 - 119*				
Surr: Toluene-d8	*54.81*	*1.0*	*50*	*0*	*110*	*89 - 112*				

ALS Houston, US Date: 30-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Special Samples
WorkOrder: HS20011312

QC BATCH REPORT

Batch ID: R355372 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MSD Sample ID: **HS20011322-01MSD** Units: **UG/L** Analysis Date: **29-Jan-2020 16:07**
Client ID: Run ID: **VOA6_355372** SeqNo: **5453817** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	20.19	1.0	20	0	101	78 - 124	20.06	0.639	20	
1,1,1-Trichloroethane	19.05	1.0	20	0	95.2	74 - 131	20	4.87	20	
1,1,2,2-Tetrachloroethane	19.19	1.0	20	0	96.0	71 - 121	18.56	3.33	20	
1,1,2-Trichloroethane	19.13	1.0	20	0	95.7	80 - 119	19.4	1.37	20	
1,1-Dichloroethane	17.62	1.0	20	0	88.1	77 - 125	18.33	3.98	20	
1,1-Dichloroethene	16.83	1.0	20	0	84.1	71 - 131	18.52	9.56	20	
1,1-Dichloropropene	18.51	1.0	20	0	92.6	78 - 125	19.69	6.18	20	
1,2,3-Trichlorobenzene	17.42	1.0	20	0	87.1	69 - 129	14.01	21.7	20	R
1,2,3-Trichloropropane	19.68	1.0	20	0	98.4	73 - 122	18.5	6.17	20	
1,2,4-Trichlorobenzene	16.1	1.0	20	0	80.5	69 - 130	15.28	5.23	20	
1,2,4-Trimethylbenzene	20.28	1.0	20	0	101	76 - 124	20.11	0.814	20	
1,2-Dibromo-3-chloropropane	18.19	1.0	20	0	91.0	62 - 128	17.47	4.07	20	
1,2-Dibromoethane	19.49	1.0	20	0	97.4	77 - 121	19.33	0.838	20	
1,2-Dichlorobenzene	19.67	1.0	20	0	98.3	80 - 119	18.99	3.49	20	
1,2-Dichloroethane	18.55	1.0	20	0	92.8	73 - 128	18.73	0.932	20	
1,2-Dichloropropane	17.82	1.0	20	0	89.1	78 - 122	18.32	2.75	20	
1,3,5-Trimethylbenzene	20.38	1.0	20	0	102	75 - 124	20.48	0.513	20	
1,3-Dichlorobenzene	20.25	1.0	20	0	101	80 - 119	19.64	3.02	20	
1,3-Dichloropropane	19.09	1.0	20	0	95.4	80 - 119	18.71	1.99	20	
1,4-Dichlorobenzene	19.72	1.0	20	0	98.6	79 - 118	19.3	2.14	20	
2,2-Dichloropropane	18.2	1.0	20	0	91.0	60 - 139	19.28	5.78	20	
2-Butanone	35.61	2.0	40	0	89.0	56 - 143	34.74	2.46	20	
2-Chlorotoluene	19.62	1.0	20	0	98.1	79 - 122	20.04	2.09	20	
2-Hexanone	37.4	2.0	40	0	93.5	57 - 139	36.12	3.48	20	
4-Chlorotoluene	19.74	1.0	20	0	98.7	78 - 122	20.11	1.83	20	
4-Isopropyltoluene	18.64	1.0	20	0	93.2	77 - 127	18.48	0.823	20	
4-Methyl-2-pentanone	38.2	2.0	40	0	95.5	67 - 130	37.19	2.69	20	
Acetone	43.23	2.0	40	11.93	78.2	39 - 160	42.69	1.24	20	
Benzene	23.56	1.0	20	5.556	90.0	79 - 120	24.56	4.18	20	
Bromobenzene	20	1.0	20	0	100	80 - 120	19.97	0.16	20	
Bromochloromethane	17.43	1.0	20	0	87.2	78 - 123	17.78	2	20	
Bromodichloromethane	18.52	1.0	20	0	92.6	79 - 125	18.84	1.73	20	
Bromoform	20.23	1.0	20	0	101	66 - 130	19.24	5.05	20	
Bromomethane	16	1.0	20	0	80.0	53 - 141	17.9	11.2	20	

ALS Houston, US Date: 30-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Special Samples
WorkOrder: HS20011312

QC BATCH REPORT

Batch ID: R355372 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MSD Sample ID: **HS20011322-01MSD** Units: **UG/L** Analysis Date: **29-Jan-2020 16:07**
Client ID: Run ID: **VOA6_355372** SeqNo: **5453817** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Carbon disulfide	33.11	2.0	40	0	82.8	64 - 133	35.49	6.95	20	
Carbon tetrachloride	18.46	1.0	20	0	92.3	72 - 136	19.5	5.49	20	
Chlorobenzene	19.71	1.0	20	0	98.6	82 - 118	20.03	1.61	20	
Chloroethane	15.68	1.0	20	0	78.4	60 - 138	16.82	7	20	
Chloroform	17.06	1.0	20	0	85.3	79 - 124	17.59	3.04	20	
Chloromethane	11.6	1.0	20	0	58.0	50 - 139	12.12	4.36	20	
cis-1,2-Dichloroethene	17.67	1.0	20	0	88.3	78 - 123	18.92	6.85	20	
cis-1,3-Dichloropropene	18.61	1.0	20	0	93.1	75 - 124	18.56	0.26	20	
Dibromochloromethane	19.43	1.0	20	0	97.2	74 - 126	19.34	0.463	20	
Dibromomethane	18.92	1.0	20	0	94.6	79 - 123	18.72	1.08	20	
Dichlorodifluoromethane	7.435	1.0	20	0	37.2	32 - 152	8.083	8.35	20	
Ethylbenzene	20.24	1.0	20	0	101	79 - 121	21.07	4	20	
Hexachlorobutadiene	13.45	1.0	20	0	67.3	66 - 134	13.68	1.65	20	
Isopropylbenzene	20.51	1.0	20	0	103	72 - 131	20.51	0.00711	20	
m,p-Xylene	43.4	2.0	40	3.167	101	80 - 121	44.1	1.6	20	
Methylene chloride	16.93	2.0	20	0	84.7	74 - 124	18.08	6.58	20	
Naphthalene	18.34	1.0	20	0	91.7	61 - 128	15	20	20	R
n-Butylbenzene	17.8	1.0	20	0	89.0	75 - 128	17.6	1.13	20	
n-Propylbenzene	20.24	1.0	20	0	101	76 - 126	20.63	1.92	20	
o-Xylene	22.38	1.0	20	1.891	102	78 - 122	22.69	1.4	20	
sec-Butylbenzene	19.6	1.0	20	0	98.0	77 - 126	19.88	1.43	20	
Styrene	19.96	1.0	20	0	99.8	78 - 123	20.23	1.33	20	
tert-Butylbenzene	20.23	1.0	20	0	101	78 - 124	20.31	0.387	20	
Tetrachloroethene	20.86	1.0	20	0	104	74 - 129	22.04	5.51	20	
Toluene	21.17	1.0	20	1.14	100	80 - 121	21.73	2.59	20	
trans-1,2-Dichloroethene	17.67	1.0	20	0	88.4	75 - 124	19.35	9.07	20	
trans-1,3-Dichloropropene	18.65	1.0	20	0	93.2	73 - 127	18.33	1.7	20	
Trichloroethene	18.85	1.0	20	0	94.3	79 - 123	19.58	3.81	20	
Trichlorofluoromethane	17.92	1.0	20	0	89.6	65 - 141	19.76	9.79	20	
Vinyl chloride	13.45	1.0	20	0.4067	65.2	58 - 137	14.94	10.5	20	
Surr: 1,2-Dichloroethane-d4	*46.29*	*1.0*	*50*	*0*	*92.6*	*81 - 118*	*47.87*	*3.35*	*20*	
Surr: 4-Bromofluorobenzene	*51.76*	*1.0*	*50*	*0*	*104*	*85 - 114*	*50.83*	*1.82*	*20*	
Surr: Dibromofluoromethane	*48.49*	*1.0*	*50*	*0*	*97.0*	*80 - 119*	*48.93*	*0.899*	*20*	
Surr: Toluene-d8	*55.15*	*1.0*	*50*	*0*	*110*	*89 - 112*	*54.81*	*0.626*	*20*	

ALS Houston, US Date: 30-Jan-20

Client:	Bhate Environmental Associates, Inc.
Project:	Longhorn GW Treatment Plant Special Samples
WorkOrder:	HS20011312

QC BATCH REPORT

Batch ID:	**R355372 (0)**	**Instrument:**	**VOA6**	**Method:**	**VOLATILES ORGANICS BY METHOD 8260C**

The following samples were analyzed in this batch:	HS20011312-01	HS20011312-02

ALS Houston, US Date: 30-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Special Samples
WorkOrder: **HS20011312**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	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	624-2020	31-Dec-2020
North Dakota	R-193 2019-2020	30-Apr-2020
Oklahoma	2019-067	31-Aug-2020
Texas	T104704231-19-25	30-Apr-2020

ALS Houston, US Date: 30-Jan-20

Sample Receipt Checklist

Client Name: Bhate Environmental
Work Order: HS20011312
Date/Time Received: **29-Jan-2020 08:26**
Received by: **AC**

Checklist completed by: *Paresh M. Giga* eSignature 29-Jan-2020 Date
Reviewed by: *RJ Modashia* eSignature 29-Jan-2020 Date

Matrices: **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):	1.6c U/C	IR25
Cooler(s)/Kit(s):	44847	
Date/Time sample(s) sent to storage:	1/29/2020 10:15	

Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

CHAIN OF CUSTODY

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

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

Project No. NWO1312.0150.0 16.0001

Job: GROUNDWATER TREATMENT PLANT SPECIAL SAMPLES

Prepared By: Scott Beesinger

P.O. Number

HS20011312
Bhate Environmental Associates, Inc.
Longhorn GW Treatment Plant Special Samples

Field Sample I.D.	Sample Matrix	Date / Time	MS / MSD	No. OF CONTAINERS	Analyses: VOC	Remarks (Preservatives, etc.)	Lab I.D.#
LH18/24-SP650_012820	Water	01/28/20 / 14:00		3	X	HCl	
Trip Blank	Water	01/28/20		2	X		

Additional Remarks: **24 hour TAT**

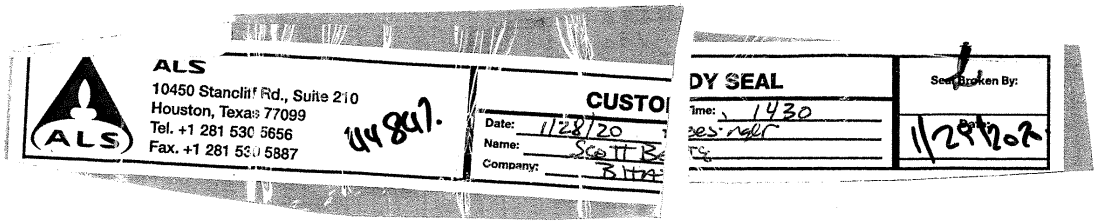
Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
Scott Beesinger	01/28/20	14:30									

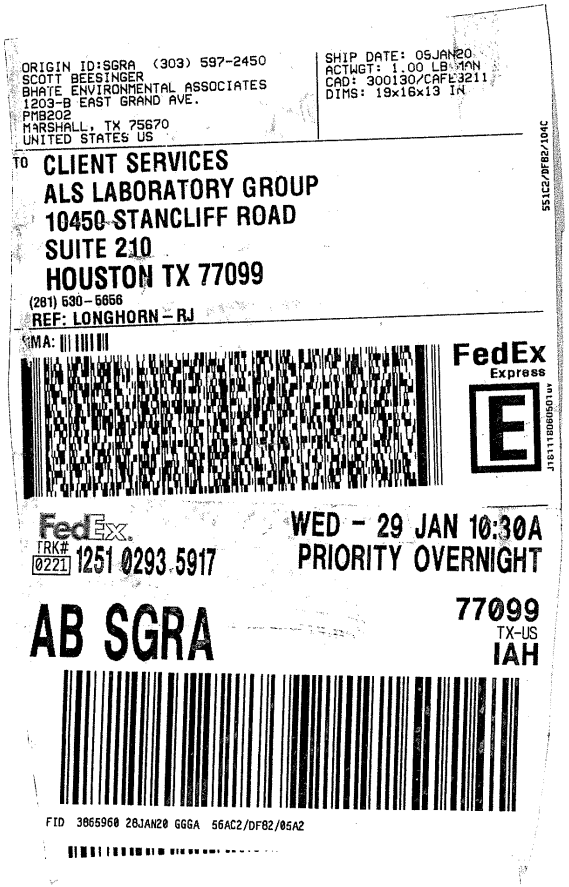
For Lab Use Only

Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition
AC	1/29/2020	08:26							

Remarks:
u/c 1.6 IR #25 cF 0.0 44 847

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


ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887
CUSTO
Date: 11/28/20
Name: Scott B
Company:
DY SEAL
Time: 1430
Seal Broken By:
11/29/20


ORIGIN ID:SGRA (303) 597-2450
SCOTT BEESINGER
BHATE ENVIRONMENTAL ASSOCIATES
1203-B EAST GRAND AVE.
PMB202
MARSHALL, TX 75670
UNITED STATES US
SHIP DATE: 05JAN20
ACTWGT: 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) 530-5656
REF: LONGHORN - RJ
FedEx Express
FedEx
TRK# 0221 1251 0293 5917
WED - 29 JAN 10:30A
PRIORITY OVERNIGHT
AB SGRA
77099
TX-US
IAH
FID 3865960 28JAN20 GGGA 56AC2/DF82/05A2

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

February 12, 2020

Marcia Olive
Bhate Environmental Associates, Inc.
445 Union Blvd Ste 129
Lakewood, CO 80228

Work Order: **HS20020146**

Laboratory Results for: **Longhorn GW Treatment Plant Bi Weekly Samples**

Dear Marcia,

ALS Environmental received 2 sample(s) on Feb 05, 2020 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: 12-Feb-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi Weekly Samples
Work Order: HS20020146

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS20020146-01	LH18/24-SP650_020420	Water		04-Feb-2020 14:00	05-Feb-2020 08:41	☐
HS20020146-02	Trip Blank	Water	CG-111519-106	04-Feb-2020 00:00	05-Feb-2020 08:41	☐

ALS Houston, US Date: 12-Feb-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi Weekly Samples
Work Order: HS20020146

CASE NARRATIVE

GCMS Volatiles by Method SW8260

Batch ID: R355767

Sample ID: LH18/24-SP650_020420 (HS20020146-01MS)

- MS and/or MSD recovered outside control limits for multiple compounds

WetChemistry by Method SW9056

Batch ID: R356035

Sample ID: HS20020365-01MS

- MS and MSD are for an unrelated sample (Chloride,Sulfate)

ALS Houston, US Date: 12-Feb-20

Client: Bhate Environmental Associates, Inc.
ANALYTICAL REPORT
Project: Longhorn GW Treatment Plant Bi Weekly Samples WorkOrder:HS20020146
Sample ID: LH18/24-SP650_020420 Lab ID:HS20020146-01
Collection Date: 04-Feb-2020 14:00 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	05-Feb-2020 13:55
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	05-Feb-2020 13:55
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	05-Feb-2020 13:55
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	05-Feb-2020 13:55
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	05-Feb-2020 13:55
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	05-Feb-2020 13:55
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	05-Feb-2020 13:55
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	05-Feb-2020 13:55
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	05-Feb-2020 13:55
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	05-Feb-2020 13:55
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	05-Feb-2020 13:55
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	05-Feb-2020 13:55
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	05-Feb-2020 13:55
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	05-Feb-2020 13:55
1,2-Dichloroethane	**1.4**		**0.20**	**0.50**	**1.0**	**UG/L**	1	05-Feb-2020 13:55
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	05-Feb-2020 13:55
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	05-Feb-2020 13:55
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	05-Feb-2020 13:55
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	05-Feb-2020 13:55
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	05-Feb-2020 13:55
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	05-Feb-2020 13:55
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	05-Feb-2020 13:55
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	05-Feb-2020 13:55
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	05-Feb-2020 13:55
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	05-Feb-2020 13:55
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	05-Feb-2020 13:55
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	05-Feb-2020 13:55
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	05-Feb-2020 13:55
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	05-Feb-2020 13:55
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	05-Feb-2020 13:55
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	05-Feb-2020 13:55
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	05-Feb-2020 13:55
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	05-Feb-2020 13:55
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	05-Feb-2020 13:55
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	05-Feb-2020 13:55
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	05-Feb-2020 13:55
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	05-Feb-2020 13:55
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	05-Feb-2020 13:55
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	05-Feb-2020 13:55

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

ALS Houston, US Date: 12-Feb-20

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**
Project: Longhorn GW Treatment Plant Bi Weekly Samples WorkOrder:HS20020146
Sample ID: LH18/24-SP650_020420 Lab ID:HS20020146-01
Collection Date: 04-Feb-2020 14:00 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	05-Feb-2020 13:55
cis-1,2-Dichloroethene	**28**		**0.20**	**0.50**	**1.0**	**UG/L**	1	05-Feb-2020 13:55
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	05-Feb-2020 13:55
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	05-Feb-2020 13:55
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	05-Feb-2020 13:55
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	05-Feb-2020 13:55
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	05-Feb-2020 13:55
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	05-Feb-2020 13:55
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	05-Feb-2020 13:55
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	05-Feb-2020 13:55
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	05-Feb-2020 13:55
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	05-Feb-2020 13:55
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	05-Feb-2020 13:55
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	05-Feb-2020 13:55
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	05-Feb-2020 13:55
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	05-Feb-2020 13:55
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	05-Feb-2020 13:55
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	05-Feb-2020 13:55
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	05-Feb-2020 13:55
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	05-Feb-2020 13:55
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	05-Feb-2020 13:55
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	05-Feb-2020 13:55
Trichloroethene	**5.6**		**0.20**	**0.50**	**1.0**	**UG/L**	1	05-Feb-2020 13:55
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	05-Feb-2020 13:55
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	05-Feb-2020 13:55
Surr: 1,2-Dichloroethane-d4	*96.2*			**0**	*81-118*	*%REC*	*1*	*05-Feb-2020 13:55*
Surr: 4-Bromofluorobenzene	*103*			**0**	*85-114*	*%REC*	*1*	*05-Feb-2020 13:55*
Surr: Dibromofluoromethane	*96.7*			**0**	*80-119*	*%REC*	*1*	*05-Feb-2020 13:55*
Surr: Toluene-d8	*111*			**0**	*89-112*	*%REC*	*1*	*05-Feb-2020 13:55*
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KVL
Chloride	**501**		**2.00**	**5.00**	**5.00**	**mg/L**	10	10-Feb-2020 16:34
Sulfate	**25.8**		**2.00**	**5.00**	**5.00**	**mg/L**	10	10-Feb-2020 16:34

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

ALS Houston, US Date: 12-Feb-20

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**
Project: Longhorn GW Treatment Plant Bi Weekly Samples WorkOrder:HS20020146
Sample ID: Trip Blank Lab ID:HS20020146-02
Collection Date: 04-Feb-2020 00:00 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	05-Feb-2020 13:31
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	05-Feb-2020 13:31
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	05-Feb-2020 13:31
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	05-Feb-2020 13:31
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	05-Feb-2020 13:31
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	05-Feb-2020 13:31
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	05-Feb-2020 13:31
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	05-Feb-2020 13:31
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	05-Feb-2020 13:31
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	05-Feb-2020 13:31
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	05-Feb-2020 13:31
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	05-Feb-2020 13:31
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	05-Feb-2020 13:31
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	05-Feb-2020 13:31
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	05-Feb-2020 13:31
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	05-Feb-2020 13:31
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	05-Feb-2020 13:31
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	05-Feb-2020 13:31
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	05-Feb-2020 13:31
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	05-Feb-2020 13:31
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	05-Feb-2020 13:31
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	05-Feb-2020 13:31
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	05-Feb-2020 13:31
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	05-Feb-2020 13:31
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	05-Feb-2020 13:31
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	05-Feb-2020 13:31
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	05-Feb-2020 13:31
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	05-Feb-2020 13:31
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	05-Feb-2020 13:31
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	05-Feb-2020 13:31
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	05-Feb-2020 13:31
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	05-Feb-2020 13:31
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	05-Feb-2020 13:31
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	05-Feb-2020 13:31
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	05-Feb-2020 13:31
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	05-Feb-2020 13:31
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	05-Feb-2020 13:31
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	05-Feb-2020 13:31
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	05-Feb-2020 13:31

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

ALS Houston, US Date: 12-Feb-20

Client: Bhate Environmental Associates, Inc.
ANALYTICAL REPORT
Project: Longhorn GW Treatment Plant Bi Weekly Samples WorkOrder:HS20020146
Sample ID: Trip Blank Lab ID:HS20020146-02
Collection Date: 04-Feb-2020 00:00 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	05-Feb-2020 13:31
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	05-Feb-2020 13:31
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	05-Feb-2020 13:31
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	05-Feb-2020 13:31
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	05-Feb-2020 13:31
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	05-Feb-2020 13:31
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	05-Feb-2020 13:31
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	05-Feb-2020 13:31
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	05-Feb-2020 13:31
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	05-Feb-2020 13:31
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	05-Feb-2020 13:31
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	05-Feb-2020 13:31
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	05-Feb-2020 13:31
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	05-Feb-2020 13:31
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	05-Feb-2020 13:31
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	05-Feb-2020 13:31
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	05-Feb-2020 13:31
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	05-Feb-2020 13:31
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	05-Feb-2020 13:31
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	05-Feb-2020 13:31
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	05-Feb-2020 13:31
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	05-Feb-2020 13:31
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	05-Feb-2020 13:31
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	05-Feb-2020 13:31
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	05-Feb-2020 13:31
Surr: 1,2-Dichloroethane-d4	*96.2*			**0**	*81-118*	*%REC*	*1*	*05-Feb-2020 13:31*
Surr: 4-Bromofluorobenzene	*103*			**0**	*85-114*	*%REC*	*1*	*05-Feb-2020 13:31*
Surr: Dibromofluoromethane	*97.9*			**0**	*80-119*	*%REC*	*1*	*05-Feb-2020 13:31*
Surr: Toluene-d8	*110*			**0**	*89-112*	*%REC*	*1*	*05-Feb-2020 13:31*

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

ALS Houston, US Date: 12-Feb-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi Weekly Samples
WorkOrder: HS20020146

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R355767 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Water	
HS20020146-01	LH18/24-SP650_020420	04 Feb 2020 14:00			05 Feb 2020 13:55	1
HS20020146-02	Trip Blank	04 Feb 2020 00:00			05 Feb 2020 13:31	1
Batch ID: R356035 (0)	**Test Name :** ANIONS BY SW9056A				**Matrix:** Water	
HS20020146-01	LH18/24-SP650_020420	04 Feb 2020 14:00			10 Feb 2020 16:34	10

ALS Houston, US Date: 12-Feb-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi Weekly Samples
WorkOrder: HS20020146

QC BATCH REPORT

Batch ID: R355767 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-200205** Units: **UG/L** Analysis Date: **05-Feb-2020 13:07**
Client ID: Run ID: **VOA6_355767** SeqNo: **5461990** 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: 12-Feb-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi Weekly Samples
WorkOrder: HS20020146

QC BATCH REPORT

Batch ID: R355767 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-200205** Units: **UG/L** Analysis Date: **05-Feb-2020 13:07**
Client ID: Run ID: **VOA6_355767** SeqNo: **5461990** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	1.0	2.0								U
Carbon tetrachloride	0.50	1.0								U
Chlorobenzene	0.50	1.0								U
Chloroethane	0.50	1.0								U
Chloroform	0.50	1.0								U
Chloromethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
cis-1,3-Dichloropropene	0.50	1.0								U
Dibromochloromethane	0.50	1.0								U
Dibromomethane	0.50	1.0								U
Dichlorodifluoromethane	0.50	1.0								U
Ethylbenzene	0.50	1.0								U
Hexachlorobutadiene	1.0	1.0								U
Isopropylbenzene	0.50	1.0								U
m,p-Xylene	1.0	2.0								U
Methylene chloride	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	*48.36*	*1.0*	*50*	*0*	*96.7*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*51.73*	*1.0*	*50*	*0*	*103*	*85 - 114*				
Surr: Dibromofluoromethane	*49.33*	*1.0*	*50*	*0*	*98.7*	*80 - 119*				
Surr: Toluene-d8	*54.76*	*1.0*	*50*	*0*	*110*	*89 - 112*				

ALS Houston, US Date: 12-Feb-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi Weekly Samples
WorkOrder: HS20020146

QC BATCH REPORT

Batch ID: R355767 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

LCS Sample ID: **VLCSW-200205** Units: **UG/L** Analysis Date: **05-Feb-2020 12:18**
Client ID: Run ID: **VOA6_355767** SeqNo: **5461989** 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	22.06	1.0	20	0	110	78 - 124				
1,1,1-Trichloroethane	21.28	1.0	20	0	106	74 - 131				
1,1,2,2-Tetrachloroethane	20.12	1.0	20	0	101	71 - 121				
1,1,2-Trichloroethane	20.03	1.0	20	0	100	80 - 119				
1,1-Dichloroethane	20.38	1.0	20	0	102	77 - 125				
1,1-Dichloroethene	20.42	1.0	20	0	102	71 - 131				
1,1-Dichloropropene	20.02	1.0	20	0	100	78 - 125				
1,2,3-Trichlorobenzene	24.96	1.0	20	0	125	69 - 129				
1,2,3-Trichloropropane	20.07	1.0	20	0	100	73 - 122				
1,2,4-Trichlorobenzene	22.02	1.0	20	0	110	69 - 130				
1,2,4-Trimethylbenzene	20.76	1.0	20	0	104	76 - 124				
1,2-Dibromo-3-chloropropane	20.49	1.0	20	0	102	62 - 128				
1,2-Dibromoethane	21.34	1.0	20	0	107	77 - 121				
1,2-Dichlorobenzene	20.85	1.0	20	0	104	80 - 119				
1,2-Dichloroethane	22.71	1.0	20	0	114	73 - 128				
1,2-Dichloropropane	20	1.0	20	0	100.0	78 - 122				
1,3,5-Trimethylbenzene	20.56	1.0	20	0	103	75 - 124				
1,3-Dichlorobenzene	21.03	1.0	20	0	105	80 - 119				
1,3-Dichloropropane	20.52	1.0	20	0	103	80 - 119				
1,4-Dichlorobenzene	20.4	1.0	20	0	102	79 - 118				
2,2-Dichloropropane	20.68	1.0	20	0	103	60 - 139				
2-Butanone	41.07	2.0	40	0	103	56 - 143				
2-Chlorotoluene	20.26	1.0	20	0	101	79 - 122				
2-Hexanone	42.14	2.0	40	0	105	57 - 139				
4-Chlorotoluene	20.39	1.0	20	0	102	78 - 122				
4-Isopropyltoluene	18.53	1.0	20	0	92.7	77 - 127				
4-Methyl-2-pentanone	43.57	2.0	40	0	109	67 - 130				
Acetone	44.49	2.0	40	0	111	39 - 160				
Benzene	20.7	1.0	20	0	104	79 - 120				
Bromobenzene	20.79	1.0	20	0	104	80 - 120				
Bromochloromethane	20.65	1.0	20	0	103	78 - 123				
Bromodichloromethane	21.11	1.0	20	0	106	79 - 125				
Bromoform	22.45	1.0	20	0	112	66 - 130				
Bromomethane	23.05	1.0	20	0	115	53 - 141				

ALS Houston, US Date: 12-Feb-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi Weekly Samples
WorkOrder: HS20020146

QC BATCH REPORT

Batch ID: R355767 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

LCS Sample ID: **VLCSW-200205** Units: **UG/L** Analysis Date: **05-Feb-2020 12:18**
Client ID: Run ID: **VOA6_355767** SeqNo: **5461989** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	39.24	2.0	40	0	98.1	64 - 133				
Carbon tetrachloride	20.14	1.0	20	0	101	72 - 136				
Chlorobenzene	20.92	1.0	20	0	105	82 - 118				
Chloroethane	20.68	1.0	20	0	103	60 - 138				
Chloroform	19.45	1.0	20	0	97.3	79 - 124				
Chloromethane	19.29	1.0	20	0	96.5	50 - 139				
cis-1,2-Dichloroethene	20.08	1.0	20	0	100	78 - 123				
cis-1,3-Dichloropropene	20.94	1.0	20	0	105	75 - 124				
Dibromochloromethane	21.46	1.0	20	0	107	74 - 126				
Dibromomethane	21.16	1.0	20	0	106	79 - 123				
Dichlorodifluoromethane	19.21	1.0	20	0	96.1	32 - 152				
Ethylbenzene	21.08	1.0	20	0	105	79 - 121				
Hexachlorobutadiene	22.55	1.0	20	0	113	66 - 134				
Isopropylbenzene	20.6	1.0	20	0	103	72 - 131				
m,p-Xylene	41.84	2.0	40	0	105	80 - 121				
Methylene chloride	20.29	2.0	20	0	101	74 - 124				
Naphthalene	22.45	1.0	20	0	112	61 - 128				
n-Butylbenzene	18.7	1.0	20	0	93.5	75 - 128				
n-Propylbenzene	20.05	1.0	20	0	100	76 - 126				
o-Xylene	21.33	1.0	20	0	107	78 - 122				
sec-Butylbenzene	19.36	1.0	20	0	96.8	77 - 126				
Styrene	21.18	1.0	20	0	106	78 - 123				
tert-Butylbenzene	20.29	1.0	20	0	101	78 - 124				
Tetrachloroethene	21.45	1.0	20	0	107	74 - 129				
Toluene	21.03	1.0	20	0	105	80 - 121				
trans-1,2-Dichloroethene	20.29	1.0	20	0	101	75 - 124				
trans-1,3-Dichloropropene	20.78	1.0	20	0	104	73 - 127				
Trichloroethene	20.81	1.0	20	0	104	79 - 123				
Trichlorofluoromethane	21.8	1.0	20	0	109	65 - 141				
Vinyl chloride	19.78	1.0	20	0	98.9	58 - 137				
Surr: 1,2-Dichloroethane-d4	*52.81*	*1.0*	*50*	*0*	*106*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*52.95*	*1.0*	*50*	*0*	*106*	*85 - 114*				
Surr: Dibromofluoromethane	*52.48*	*1.0*	*50*	*0*	*105*	*80 - 119*				
Surr: Toluene-d8	*53.23*	*1.0*	*50*	*0*	*106*	*89 - 112*				

ALS Houston, US Date: 12-Feb-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi Weekly Samples
WorkOrder: HS20020146

QC BATCH REPORT

Batch ID: R355767 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS20020146-01MS** Units: **UG/L** Analysis Date: **05-Feb-2020 15:31**
Client ID: **LH18/24-SP650_020420** Run ID: **VOA6_355767** SeqNo: **5461993** 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	19.8	1.0	20	0	99.0	78 - 124				
1,1,1-Trichloroethane	19.96	1.0	20	0	99.8	74 - 131				
1,1,2,2-Tetrachloroethane	18.46	1.0	20	0	92.3	71 - 121				
1,1,2-Trichloroethane	19.04	1.0	20	0	95.2	80 - 119				
1,1-Dichloroethane	18.29	1.0	20	0	91.5	77 - 125				
1,1-Dichloroethene	17.71	1.0	20	0	88.6	71 - 131				
1,1-Dichloropropene	19.35	1.0	20	0	96.7	78 - 125				
1,2,3-Trichlorobenzene	16.88	1.0	20	0	84.4	69 - 129				
1,2,3-Trichloropropane	18.72	1.0	20	0	93.6	73 - 122				
1,2,4-Trichlorobenzene	16.63	1.0	20	0	83.1	69 - 130				
1,2,4-Trimethylbenzene	19.97	1.0	20	0	99.9	76 - 124				
1,2-Dibromo-3-chloropropane	17.72	1.0	20	0	88.6	62 - 128				
1,2-Dibromoethane	19.32	1.0	20	0	96.6	77 - 121				
1,2-Dichlorobenzene	19.14	1.0	20	0	95.7	80 - 119				
1,2-Dichloroethane	21.28	1.0	20	1.357	99.6	73 - 128				
1,2-Dichloropropane	17.94	1.0	20	0	89.7	78 - 122				
1,3,5-Trimethylbenzene	20.69	1.0	20	0	103	75 - 124				
1,3-Dichlorobenzene	19.59	1.0	20	0	98.0	80 - 119				
1,3-Dichloropropane	18.59	1.0	20	0	93.0	80 - 119				
1,4-Dichlorobenzene	19.22	1.0	20	0	96.1	79 - 118				
2,2-Dichloropropane	18.6	1.0	20	0	93.0	60 - 139				
2-Butanone	35.95	2.0	40	0	89.9	56 - 143				
2-Chlorotoluene	19.71	1.0	20	0	98.6	79 - 122				
2-Hexanone	38.72	2.0	40	0	96.8	57 - 139				
4-Chlorotoluene	19.46	1.0	20	0	97.3	78 - 122				
4-Isopropyltoluene	19.22	1.0	20	0	96.1	77 - 127				
4-Methyl-2-pentanone	39.28	2.0	40	0	98.2	67 - 130				
Acetone	35.29	2.0	40	0	88.2	39 - 160				
Benzene	18.84	1.0	20	0	94.2	79 - 120				
Bromobenzene	19.53	1.0	20	0	97.6	80 - 120				
Bromochloromethane	17.67	1.0	20	0	88.3	78 - 123				
Bromodichloromethane	19.1	1.0	20	0	95.5	79 - 125				
Bromoform	20.37	1.0	20	0	102	66 - 130				
Bromomethane	15.76	1.0	20	0	78.8	53 - 141				

ALS Houston, US Date: 12-Feb-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi Weekly Samples
WorkOrder: HS20020146

QC BATCH REPORT

Batch ID: R355767 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS20020146-01MS** Units: **UG/L** Analysis Date: **05-Feb-2020 15:31**
Client ID: **LH18/24-SP650_020420** Run ID: **VOA6_355767** SeqNo: **5461993** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	32.33	2.0	40	0	80.8	64 - 133				
Carbon tetrachloride	19.68	1.0	20	0	98.4	72 - 136				
Chlorobenzene	19.51	1.0	20	0	97.5	82 - 118				
Chloroethane	15.17	1.0	20	0	75.8	60 - 138				
Chloroform	17.15	1.0	20	0	85.8	79 - 124				
Chloromethane	9.362	1.0	20	0	46.8	50 - 139				S
cis-1,2-Dichloroethene	46.52	1.0	20	28.36	90.8	78 - 123				
cis-1,3-Dichloropropene	18.45	1.0	20	0	92.3	75 - 124				
Dibromochloromethane	19.55	1.0	20	0	97.8	74 - 126				
Dibromomethane	18.26	1.0	20	0	91.3	79 - 123				
Dichlorodifluoromethane	5.296	1.0	20	0	26.5	32 - 152				S
Ethylbenzene	20.66	1.0	20	0	103	79 - 121				
Hexachlorobutadiene	17.72	1.0	20	0	88.6	66 - 134				
Isopropylbenzene	20.93	1.0	20	0	105	72 - 131				
m,p-Xylene	40.61	2.0	40	0	102	80 - 121				
Methylene chloride	17.41	2.0	20	0	87.1	74 - 124				
Naphthalene	16.47	1.0	20	0	82.4	61 - 128				
n-Butylbenzene	18.77	1.0	20	0	93.9	75 - 128				
n-Propylbenzene	20.37	1.0	20	0	102	76 - 126				
o-Xylene	20.54	1.0	20	0	103	78 - 122				
sec-Butylbenzene	20.52	1.0	20	0	103	77 - 126				
Styrene	21.11	1.0	20	0	106	78 - 123				
tert-Butylbenzene	20.85	1.0	20	0	104	78 - 124				
Tetrachloroethene	20.9	1.0	20	0	105	74 - 129				
Toluene	19.93	1.0	20	0	99.6	80 - 121				
trans-1,2-Dichloroethene	18.09	1.0	20	0	90.5	75 - 124				
trans-1,3-Dichloropropene	18.37	1.0	20	0	91.9	73 - 127				
Trichloroethene	24.67	1.0	20	5.616	95.3	79 - 123				
Trichlorofluoromethane	18.61	1.0	20	0	93.0	65 - 141				
Vinyl chloride	12	1.0	20	0	60.0	58 - 137				
Surr: 1,2-Dichloroethane-d4	*48.63*	*1.0*	*50*	*0*	*97.3*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*51.12*	*1.0*	*50*	*0*	*102*	*85 - 114*				
Surr: Dibromofluoromethane	*49.28*	*1.0*	*50*	*0*	*98.6*	*80 - 119*				
Surr: Toluene-d8	*53.47*	*1.0*	*50*	*0*	*107*	*89 - 112*				

ALS Houston, US Date: 12-Feb-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi Weekly Samples
WorkOrder: HS20020146

QC BATCH REPORT

Batch ID: R355767 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MSD Sample ID: **HS20020146-01MSD** Units: **UG/L** Analysis Date: **05-Feb-2020 15:55**
Client ID: **LH18/24-SP650_020420** Run ID: **VOA6_355767** SeqNo: **5461994** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	19.19	1.0	20	0	96.0	78 - 124	19.8	3.12	20	
1,1,1-Trichloroethane	19.05	1.0	20	0	95.2	74 - 131	19.96	4.68	20	
1,1,2,2-Tetrachloroethane	18.67	1.0	20	0	93.3	71 - 121	18.46	1.13	20	
1,1,2-Trichloroethane	18.97	1.0	20	0	94.8	80 - 119	19.04	0.381	20	
1,1-Dichloroethane	17.7	1.0	20	0	88.5	77 - 125	18.29	3.28	20	
1,1-Dichloroethene	16.61	1.0	20	0	83.0	71 - 131	17.71	6.43	20	
1,1-Dichloropropene	18.16	1.0	20	0	90.8	78 - 125	19.35	6.34	20	
1,2,3-Trichlorobenzene	20.44	1.0	20	0	102	69 - 129	16.88	19.1	20	
1,2,3-Trichloropropane	18.75	1.0	20	0	93.8	73 - 122	18.72	0.162	20	
1,2,4-Trichlorobenzene	18.76	1.0	20	0	93.8	69 - 130	16.63	12	20	
1,2,4-Trimethylbenzene	19.82	1.0	20	0	99.1	76 - 124	19.97	0.747	20	
1,2-Dibromo-3-chloropropane	17.71	1.0	20	0	88.6	62 - 128	17.72	0.0464	20	
1,2-Dibromoethane	19	1.0	20	0	95.0	77 - 121	19.32	1.68	20	
1,2-Dichlorobenzene	18.94	1.0	20	0	94.7	80 - 119	19.14	1.06	20	
1,2-Dichloroethane	20.36	1.0	20	1.357	95.0	73 - 128	21.28	4.38	20	
1,2-Dichloropropane	17.32	1.0	20	0	86.6	78 - 122	17.94	3.52	20	
1,3,5-Trimethylbenzene	19.89	1.0	20	0	99.4	75 - 124	20.69	3.96	20	
1,3-Dichlorobenzene	19.37	1.0	20	0	96.8	80 - 119	19.59	1.15	20	
1,3-Dichloropropane	18.4	1.0	20	0	92.0	80 - 119	18.59	1.06	20	
1,4-Dichlorobenzene	18.97	1.0	20	0	94.8	79 - 118	19.22	1.31	20	
2,2-Dichloropropane	17.88	1.0	20	0	89.4	60 - 139	18.6	3.93	20	
2-Butanone	36.09	2.0	40	0	90.2	56 - 143	35.95	0.397	20	
2-Chlorotoluene	19.38	1.0	20	0	96.9	79 - 122	19.71	1.7	20	
2-Hexanone	38.37	2.0	40	0	95.9	57 - 139	38.72	0.91	20	
4-Chlorotoluene	19.19	1.0	20	0	95.9	78 - 122	19.46	1.43	20	
4-Isopropyltoluene	19.08	1.0	20	0	95.4	77 - 127	19.22	0.731	20	
4-Methyl-2-pentanone	39.41	2.0	40	0	98.5	67 - 130	39.28	0.341	20	
Acetone	37.24	2.0	40	0	93.1	39 - 160	35.29	5.38	20	
Benzene	17.48	1.0	20	0	87.4	79 - 120	18.84	7.45	20	
Bromobenzene	19.13	1.0	20	0	95.7	80 - 120	19.53	2.05	20	
Bromochloromethane	17.51	1.0	20	0	87.5	78 - 123	17.67	0.903	20	
Bromodichloromethane	18.54	1.0	20	0	92.7	79 - 125	19.1	2.93	20	
Bromoform	20	1.0	20	0	100.0	66 - 130	20.37	1.85	20	
Bromomethane	15	1.0	20	0	75.0	53 - 141	15.76	4.99	20	

ALS Houston, US Date: 12-Feb-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi Weekly Samples
WorkOrder: HS20020146

QC BATCH REPORT

Batch ID: R355767 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MSD Sample ID: **HS20020146-01MSD** Units: **UG/L** Analysis Date: **05-Feb-2020 15:55**
Client ID: **LH18/24-SP650_020420** Run ID: **VOA6_355767** SeqNo: **5461994** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Carbon disulfide	30.62	2.0	40	0	76.5	64 - 133	32.33	5.45	20	
Carbon tetrachloride	18.26	1.0	20	0	91.3	72 - 136	19.68	7.47	20	
Chlorobenzene	18.97	1.0	20	0	94.8	82 - 118	19.51	2.8	20	
Chloroethane	15.29	1.0	20	0	76.4	60 - 138	15.17	0.768	20	
Chloroform	16.86	1.0	20	0	84.3	79 - 124	17.15	1.73	20	
Chloromethane	9.078	1.0	20	0	45.4	50 - 139	9.362	3.09	20	S
cis-1,2-Dichloroethene	45.41	1.0	20	28.36	85.2	78 - 123	46.52	2.42	20	
cis-1,3-Dichloropropene	17.46	1.0	20	0	87.3	75 - 124	18.45	5.52	20	
Dibromochloromethane	19.23	1.0	20	0	96.2	74 - 126	19.55	1.66	20	
Dibromomethane	18.55	1.0	20	0	92.8	79 - 123	18.26	1.56	20	
Dichlorodifluoromethane	5.018	1.0	20	0	25.1	32 - 152	5.296	5.39	20	S
Ethylbenzene	19.65	1.0	20	0	98.2	79 - 121	20.66	5.01	20	
Hexachlorobutadiene	20.42	1.0	20	0	102	66 - 134	17.72	14.2	20	
Isopropylbenzene	20.4	1.0	20	0	102	72 - 131	20.93	2.54	20	
m,p-Xylene	39.12	2.0	40	0	97.8	80 - 121	40.61	3.72	20	
Methylene chloride	16.98	2.0	20	0	84.9	74 - 124	17.41	2.53	20	
Naphthalene	19	1.0	20	0	95.0	61 - 128	16.47	14.2	20	
n-Butylbenzene	18.92	1.0	20	0	94.6	75 - 128	18.77	0.792	20	
n-Propylbenzene	19.85	1.0	20	0	99.3	76 - 126	20.37	2.58	20	
o-Xylene	19.46	1.0	20	0	97.3	78 - 122	20.54	5.38	20	
sec-Butylbenzene	20.62	1.0	20	0	103	77 - 126	20.52	0.471	20	
Styrene	20.08	1.0	20	0	100	78 - 123	21.11	5.03	20	
tert-Butylbenzene	20.44	1.0	20	0	102	78 - 124	20.85	1.99	20	
Tetrachloroethene	20.44	1.0	20	0	102	74 - 129	20.9	2.23	20	
Toluene	19.16	1.0	20	0	95.8	80 - 121	19.93	3.9	20	
trans-1,2-Dichloroethene	17.04	1.0	20	0	85.2	75 - 124	18.09	5.98	20	
trans-1,3-Dichloropropene	18.27	1.0	20	0	91.3	73 - 127	18.37	0.577	20	
Trichloroethene	23.77	1.0	20	5.616	90.7	79 - 123	24.67	3.75	20	
Trichlorofluoromethane	17.64	1.0	20	0	88.2	65 - 141	18.61	5.36	20	
Vinyl chloride	11.28	1.0	20	0	56.4	58 - 137	12	6.23	20	S
Surr: 1,2-Dichloroethane-d4	*49.56*	*1.0*	*50*	*0*	*99.1*	*81 - 118*	*48.63*	*1.89*	*20*	
Surr: 4-Bromofluorobenzene	*52.94*	*1.0*	*50*	*0*	*106*	*85 - 114*	*51.12*	*3.49*	*20*	
Surr: Dibromofluoromethane	*49.98*	*1.0*	*50*	*0*	*100.0*	*80 - 119*	*49.28*	*1.41*	*20*	
Surr: Toluene-d8	*53.25*	*1.0*	*50*	*0*	*107*	*89 - 112*	*53.47*	*0.408*	*20*	

ALS Houston, US Date: 12-Feb-20

Client:	Bhate Environmental Associates, Inc.
Project:	Longhorn GW Treatment Plant Bi Weekly Samples
WorkOrder:	HS20020146

QC BATCH REPORT

Batch ID:	**R355767 (0)**	**Instrument:**	**VOA6**	**Method:**	**VOLATILES ORGANICS BY METHOD 8260C**

The following samples were analyzed in this batch: HS20020146-01 HS20020146-02

ALS Houston, US Date: 12-Feb-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi Weekly Samples
WorkOrder: HS20020146

QC BATCH REPORT

Batch ID: R356035 (0) **Instrument: ICS-Integrion** **Method: ANIONS BY SW9056A**

MBLK Sample ID: **WBLKW2-021020** Units: **mg/L** Analysis Date: **10-Feb-2020 14:46**
Client ID: Run ID: **ICS-Integrion_356035** SeqNo: **5467696** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	0.500	0.500								U
Sulfate	0.500	0.500								U

LCS Sample ID: **WLCSW2-021020** Units: **mg/L** Analysis Date: **10-Feb-2020 15:04**
Client ID: Run ID: **ICS-Integrion_356035** SeqNo: **5467697** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	20.05	0.500	20	0	100	80 - 120				
Sulfate	20.41	0.500	20	0	102	80 - 120				

LCSD Sample ID: **WLCSDW2-021020** Units: **mg/L** Analysis Date: **10-Feb-2020 15:22**
Client ID: Run ID: **ICS-Integrion_356035** SeqNo: **5467698** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	19.96	0.500	20	0	99.8	80 - 120	20.05	0.455	20	
Sulfate	20.6	0.500	20	0	103	80 - 120	20.41	0.906	20	

MS Sample ID: **HS20020365-01MS** Units: **mg/L** Analysis Date: **10-Feb-2020 15:58**
Client ID: Run ID: **ICS-Integrion_356035** SeqNo: **5467699** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	341.3	0.500	10	338.2	31.0	80 - 120				SEO
Sulfate	162.3	0.500	10	156.3	59.7	80 - 120				SEO

MS Sample ID: **HS20020226-01MS** Units: **mg/L** Analysis Date: **10-Feb-2020 20:30**
Client ID: Run ID: **ICS-Integrion_356035** SeqNo: **5467703** PrepDate: DF: **500**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	10870	250	5000	6044	96.4	80 - 120				
Sulfate	5367	250	5000	561	96.1	80 - 120				

ALS Houston, US Date: 12-Feb-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi Weekly Samples
WorkOrder: HS20020146

QC BATCH REPORT

Batch ID: R356035 (0) **Instrument: ICS-Integrion** **Method: ANIONS BY SW9056A**

MSD Sample ID: **HS20020365-01MSD** Units: **mg/L** Analysis Date: **10-Feb-2020 16:16**
Client ID: Run ID: **ICS-Integrion_356035** SeqNo: **5467700** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	342.4	0.500	10	338.2	41.2	80 - 120	341.3	0.296	20	SEO
Sulfate	163.5	0.500	10	156.3	71.5	80 - 120	162.3	0.726	20	SEO

MSD Sample ID: **HS20020226-01MSD** Units: **mg/L** Analysis Date: **10-Feb-2020 20:48**
Client ID: Run ID: **ICS-Integrion_356035** SeqNo: **5467704** PrepDate: DF: **500**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	10800	250	5000	6044	95.2	80 - 120	10870	0.591	20	
Sulfate	5362	250	5000	561	96.0	80 - 120	5367	0.0941	20	

The following samples were analyzed in this batch: HS20020146-01

ALS Houston, US Date: 12-Feb-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi Weekly Samples
WorkOrder: **HS20020146**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

Unit Reported	Description
mg/L	Milligrams per Liter

ALS Houston, US Date: 12-Feb-20

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 V009	22-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	624-2020	31-Dec-2020
North Dakota	R-193 2019-2020	30-Apr-2020
Oklahoma	2019-067	31-Aug-2020
Texas	T104704231-19-25	30-Apr-2020

ALS Houston, US Date: 12-Feb-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi Weekly Samples
Work Order: HS20020146

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS20020146-01	LH18/24-SP650_020420	Login	2/5/2020 11:17:41 AM	PMG	WET119
HS20020146-01	LH18/24-SP650_020420	Login	2/5/2020 11:17:41 AM	PMG	VOA076
HS20020146-02	Trip Blank	Login	2/5/2020 11:17:41 AM	PMG	VOA076

00969194

ALS Houston, US Date: 12-Feb-20

Sample Receipt Checklist

Client Name: Bhate Environmental
Work Order: HS20020146
Date/Time Received: **05-Feb-2020 08:41**
Received by: **AC**

Checklist completed by: *Paresh M. Giga* eSignature 5-Feb-2020 Date
Reviewed by: *RJ Modashia* eSignature 5-Feb-2020 Date

Matrices: **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):	1.8c U/C	IR25	
Cooler(s)/Kit(s):	43292		
Date/Time sample(s) sent to storage:	2/5/2020 11:25		
Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

CHAIN OF CUSTODY

Name Of Lab Shipping To: ALS 10450 Stancliff Rd. Suite 210, Houston, Tx. 77099 ATTN: R.J. Modashia

Page 1 of 1

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

Project No. NWO1312.0150.0 16.0001

Job:
GROUNDWATER TREATMENT PLANT BI-WEEKLY SAMPLES

Prepared By: Scott Beesinger

P.O Number

HS20020146
Bhate Environmental Associates, Inc.
Longhorn GW Treatment Plant Bi Weekly Samples

Field Sample I.D.	Sample Matrix	Date / Time	MS / MSD	No. OF CONTAINERS	Analyses: VOC	Analyses: CHLORIDE, SULFATE	Remarks (Preservatives, etc.)	Lab I.D.#
LH18/24-SP650_020420	Water	02/04/20 / 14:00		3	3		HCL	
LH18/24-SP650_01220420	Water	02/04/20 / 14:00		1		1	NONE	
Trip Blank	Water	02/04/20		2	2		HCL	

Additional Remarks: Standard TAT on Chloride & Sulfate. 24 Hour TAT on VOC

Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
Scott Beesinger	02/04/20	14:30	AC	2/5/20	08:41						

9For Lab Use Only

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

Remarks
J/C 1.8 IR#25 CF0.0 43292

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

00969196

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

CUS

Date: 2/4/20
Name: Scot
Company: BH

TODY SEAL

Time: 14:30
BEESINGER
ATE

Seal Broken By:

Date: 2/5/2020

FedEx.
TRK# 0221 1251 0291 2353

WED - 05 FEB 10:30A
PRIORITY OVERNIGHT

AB SGRA 43282.

77099
TX-US
IAH

FID 3865960 04FEB20 GGGA 56AC2/049E/05A2

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

February 19, 2020

Marcia Olive
Bhate Environmental Associates, Inc.
445 Union Blvd Ste 129
Lakewood, CO 80228

Work Order: **HS20020147**

Laboratory Results for: **Longhorn GW Treatment Plant Weekly Samples**

Dear Marcia,

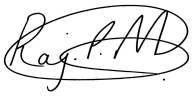
ALS Environmental received 2 sample(s) on Feb 05, 2020 for the analysis presented in the following report.

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: 19-Feb-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Weekly Samples
Work Order: HS20020147

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS20020147-01	LH18/24-SP650_020420	Water		04-Feb-2020 14:00	05-Feb-2020 08:41	☐
HS20020147-02	LH18/24-SP650_020420_BIX	Water		04-Feb-2020 14:00	05-Feb-2020 08:41	☐

ALS Houston, US Date: 19-Feb-20

Client: Bhate Environmental Associates, Inc. **CASE NARRATIVE**
Project: Longhorn GW Treatment Plant Weekly Samples
Work Order: HS20020147

Work Order Comments

- The analysis for Perchlorate were subcontracted to ALS High Res Lab Houston, TX. Final report attached..

The analysis for TOC was subcontracted to ALS Kelso, WA. Final report attached.
.

WetChemistry by Method E350.3

Batch ID: R355965

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

WetChemistry by Method E365.3

Batch ID: R355946

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

ALS Houston, US Date: 19-Feb-20

Client: Bhate Environmental Associates, Inc.
ANALYTICAL REPORT
Project: Longhorn GW Treatment Plant Weekly Samples
WorkOrder:HS20020147
Sample ID: LH18/24-SP650_020420
Lab ID:HS20020147-01
Collection Date: 04-Feb-2020 14:00
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
AMMONIA AS N BY E350.3(ISE)		**Method:E350.3**						Analyst: RG
Nitrogen, Ammonia (As N)	**4.7**	a	**0.20**	**0.10**	**0.20**	**mg/L**	1	10-Feb-2020 11:30
ORTHO PHOSPHATE (PO4) AS P BY E365.3		**Method:E365.3**						Analyst: MZD
Phosphorus, Total Orthophosphate (As P)	**1.06**	a	**0.100**	**0.250**	**0.250**	**mg/L**	10	06-Feb-2020 12:51
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	14-Feb-2020 17:14

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

ALS Houston, US Date: 19-Feb-20

Client: Bhate Environmental Associates, Inc.
ANALYTICAL REPORT
Project: Longhorn GW Treatment Plant Weekly Samples
WorkOrder:HS20020147
Sample ID: LH18/24-SP650_020420_BIX
Lab ID:HS20020147-02
Collection Date: 04-Feb-2020 14:00
Matrix:Water

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	19-Feb-2020 09:33

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

ALS Houston, US Date: 19-Feb-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Weekly Samples
WorkOrder: HS20020147

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R355946 (0)	**Test Name :** ORTHO PHOSPHATE (PO4) AS P BY E365.3				**Matrix:** Water	
HS20020147-01	LH18/24-SP650_020420	04 Feb 2020 14:00			06 Feb 2020 12:51	10
Batch ID: R355965 (0)	**Test Name :** AMMONIA AS N BY E350.3(ISE)				**Matrix:** Water	
HS20020147-01	LH18/24-SP650_020420	04 Feb 2020 14:00			10 Feb 2020 11:30	1
Batch ID: R356331 (0)	**Test Name :** SUBCONTRACT ANALYSIS - TOC ANALYSIS				**Matrix:** Water	
HS20020147-01	LH18/24-SP650_020420	04 Feb 2020 14:00			14 Feb 2020 17:14	1
Batch ID: R356527 (0)	**Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)				**Matrix:** Water	
HS20020147-02	LH18/24-SP650_020420_BIX	04 Feb 2020 14:00			19 Feb 2020 09:33	1

ALS Houston, US Date: 19-Feb-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Weekly Samples
WorkOrder: HS20020147

QC BATCH REPORT

Batch ID: R355946 (0) **Instrument:** UV-2450 **Method:** ORTHO PHOSPHATE (PO4) AS P BY E365.3

MBLK Sample ID: **MBLK-355946** Units: **mg/L** Analysis Date: **06-Feb-2020 12:51**
Client ID: Run ID: **UV-2450_355946** SeqNo: **5465772** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total Orthophosphate (As P)	0.0250	0.0250								U

LCS Sample ID: **LCS-355946** Units: **mg/L** Analysis Date: **06-Feb-2020 12:51**
Client ID: Run ID: **UV-2450_355946** SeqNo: **5465773** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total Orthophosphate (As P)	0.228	0.0250	0.25	0	91.2	85 - 115				

MS Sample ID: **HS20020147-01MS** Units: **mg/L** Analysis Date: **06-Feb-2020 12:51**
Client ID: **LH18/24-SP650_020420** Run ID: **UV-2450_355946** SeqNo: **5465775** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total Orthophosphate (As P)	3.2	0.250	2.5	1.06	85.6	80 - 120				

MSD Sample ID: **HS20020147-01MSD** Units: **mg/L** Analysis Date: **06-Feb-2020 12:51**
Client ID: **LH18/24-SP650_020420** Run ID: **UV-2450_355946** SeqNo: **5465776** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total Orthophosphate (As P)	3.21	0.250	2.5	1.06	86.0	80 - 120	3.2	0.312	20	

The following samples were analyzed in this batch: HS20020147-01

ALS Houston, US Date: 19-Feb-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Weekly Samples
WorkOrder: HS20020147

QC BATCH REPORT

Batch ID: R355965 (0) **Instrument: WetChem_HS** **Method: AMMONIA AS N BY E350.3(ISE)**

MBLK Sample ID: **MBLK-R355965** Units: **mg/L** Analysis Date: **10-Feb-2020 11:30**
Client ID: Run ID: **WetChem_HS_355965** SeqNo: **5466228** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Ammonia (As N)	0.10	0.20								U

LCS Sample ID: **LCS-R355965** Units: **mg/L** Analysis Date: **10-Feb-2020 11:30**
Client ID: Run ID: **WetChem_HS_355965** SeqNo: **5466227** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Ammonia (As N)	9.983	0.20	10	0	99.8	80 - 120				

MS Sample ID: **HS20020098-01MS** Units: **mg/L** Analysis Date: **10-Feb-2020 11:30**
Client ID: Run ID: **WetChem_HS_355965** SeqNo: **5466230** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Ammonia (As N)	10.32	0.20	10	0.31	100	80 - 120				

MSD Sample ID: **HS20020098-01MSD** Units: **mg/L** Analysis Date: **10-Feb-2020 11:30**
Client ID: Run ID: **WetChem_HS_355965** SeqNo: **5466229** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Ammonia (As N)	9.965	0.20	10	0.31	96.6	80 - 120	10.32	3.48	20	

The following samples were analyzed in this batch: HS20020147-01

ALS Houston, US Date: 19-Feb-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Weekly Samples
WorkOrder: **HS20020147**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	19-028-0	27-Mar-2020
California	2919, 2019-2020	30-Apr-2020
Dept of Defense	ANAB L2231 V009	22-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	624-2020	31-Dec-2020
North Dakota	R-193 2019-2020	30-Apr-2020
Oklahoma	2019-067	31-Aug-2020
Texas	T104704231-19-25	30-Apr-2020

ALS Houston, US Date: 19-Feb-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Weekly Samples
Work Order: HS20020147

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS20020147-01	LH18/24-SP650_020420	Login	2/5/2020 11:25:15 AM	PMG	WET267
HS20020147-01	LH18/24-SP650_020420	Login	2/5/2020 11:25:15 AM	PMG	WET267
HS20020147-01	LH18/24-SP650_020420	Login	2/5/2020 11:25:15 AM	PMG	Sub
HS20020147-02	LH18/24-SP650_020420_BIX	Login	2/5/2020 11:25:15 AM	PMG	Sub

ALS Houston, US Date: 19-Feb-20

Sample Receipt Checklist

Client Name: Bhate Environmental
Work Order: HS20020147
Date/Time Received: **05-Feb-2020 08:41**
Received by: **AC**

Checklist completed by: *Paresh M. Giga* eSignature 5-Feb-2020 Date
Reviewed by: *RJ Modashia* eSignature 5-Feb-2020 Date

Matrices: **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):	1.8c U/c	IR25	
Cooler(s)/Kit(s):	43292		
Date/Time sample(s) sent to storage:	2/5/2020 11:45		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

CHAIN OF CUSTODY

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

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

Project No. NWO1312.0150.0 16.0001

Job: GROUNDWATER TREATMENT PLANT WEEKLY SAMPLES

Prepared By: Scott Beesinger

P.O. Number

HS20020147
Bhate Environmental Associates. Inc.
Longhorn GW Treatment Plant Weekly Samples

Field Sample I.D.	Sample Matrix	Date / Time	MS / MSD	No. OF CONTAINERS	Analyses: AMMONIA-N	TOTAL ORGANIC CARBON	ORTHO-PHOSPHATE	PERCHLORATE							Remarks (Preservatives, etc.)	Lab I.D.#
LH18/24-SP650_020420	Water	02/04/20 / 14:00		3	X	X									H2SO4	
LH18/24-SP650_020420	Water	02/04/20 / 14:00		1			X								NONE	
LH18/24–SP650_020420_BIX	Water	02/04/20 / 14:00		1				X							NONE	

Additional Remarks: **Standard TAT on all parameters**

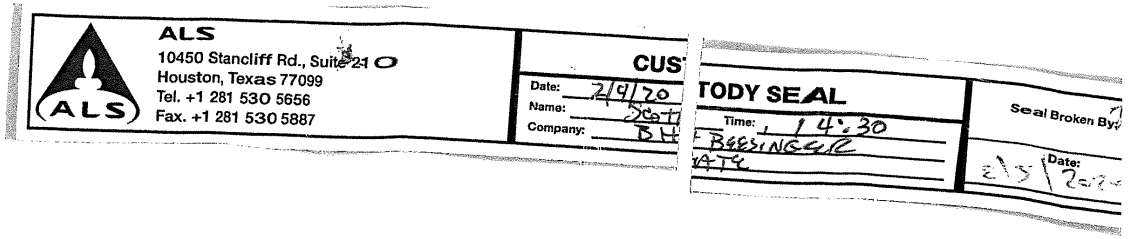
Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
Scott Beesinger	02/04/20	14:30	AC	2/5/20	08:41						

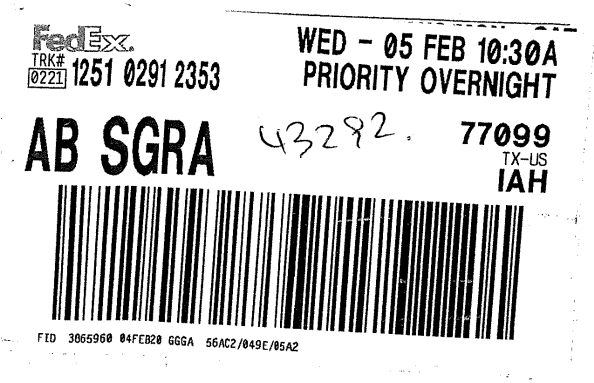
For Lab Use Only

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

Remarks: u/c 1.8 IR#25 CF0.0 43292

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


ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887
CUS
Date: 2/4/20
Name:
Company:
TODY SEAL
Time: 14:30
Seal Broken By
Date:


FedEx
TRK# 0221 1251 0291 2353
WED - 05 FEB 10:30A
PRIORITY OVERNIGHT
AB SGRA
43282.
77099
TX-US
IAH
FID 3065960 04FEB20 GGGA 56AC2/049E/05A2

February 18, 2020 Service Request No:E2000092

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

Laboratory Results for: HS20020147

Dear RJ,

Enclosed are the results of the sample(s) submitted to our laboratory February 05, 2020
For your reference, these analyses have been assigned our service request number **E2000092.**

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current TNI standards, where applicable, and except as noted in the laboratory case narrative provided. All results are intended to be considered in their entirety and ALS Environmental is not responsible for use of less than the complete final report. Results apply only to the items submitted to the laboratory, as received for analysis. In accordance with the current TNI Standard, a statement on the estimated uncertainty of measurement of any quantitative analysis will be supplied upon request.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental



Corey Grandits
Project Manager

ADDRESS 10450 Stancliff Rd., Suite 210, Houston, TX 77099
PHONE +1 281 530 5656 | FAX +1 281 530 5887
ALS Group USA, Corp.
dba ALS Environmental

Certificate of Analysis

ALS Environmental - Houston HRMS
10450 Stancliff Rd, Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

ALS Environmental

Client:	ALS Houston	**Service Request No.:**	E2000092
Project:	HS20020147	**Date Received:**	02/05/20
Sample Matrix:	W		

CASE NARRATIVE

All analyses were performed in adherence to the quality assurance program of ALS Environmental. This report contains analytical results for samples designated for Tier IV. When appropriate to the method, method blank results have been reported with each analytical test.

Sample Receipt

One sample was received for analysis at ALS Environmental in Houston on 02/05/20.

The sample was received in good condition and is consistent with the accompanying chain of custody form. The sample was stored in a refrigerator at 4°C upon receipt at the laboratory.

Data Validation Notes and Discussion

Precision and Accuracy:

EQ2000051: Laboratory Control Spike/Duplicate Laboratory Control Spike (LCS/DLCS) samples were analyzed and reported in lieu of a MS/MSD for this extraction batch. The LCS and DLCS recoveries are within QC limits.

The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and ALS Environmental (ALS) is not responsible for utilization of less than the complete report.

Use of ALS group USA Corp dba ALS Environmental (ALS)'s Name. Client shall not use ALS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to ALS any test result, tolerance or specification derived from ALS's data ("Attribution") without ALS's prior written consent, which may be withheld by ALS for any reason in its sole discretion. To request ALS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If ALS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use ALS's name or trademark in any Materials or Attribution shall be deemed denied. ALS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of ALS's name or trademark may cause ALS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.

Client: ALS Environmental - US **Service Request:**E2000092
Project: HS20020147

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
E2000092-001	LH18/24-SP650_020420_BIX	2/4/2020	1400

Service Request Summary

Folder #: **E2000092**
Client Name: ALS Environmental - US
Project Name: HS20020147
Project Number:

Report To: RJ Modashia
ALS Laboratory Group
10450 Stancliff Road
Houston, TX 77099-4338
USA
Phone Number: 281-530-5656
Cell Number:
Fax Number: 281-530-5887
E-mail: rj.modashia@alsglobal.com

Project Chemist: Corey Grandits
Originating Lab: HOUSTON
Logged By: CGRANDITS
Date Received: 02/05/20
Internal Due Date: 2/19/2020
QAP: LAB QAP
Qualifier Set: Lab Standard
Formset: Lab Standard
Merged?: N
Report to MDL?: Y
P.O. Number: HS20020147
EDD: No EDD Specified

1 250 mL-Plastic Bottle HDPE WM CLEAR Unpreserved
Location: EHRMS-WIC 2B
Pressure Gas:

Lab Samp No.	Client Samp No	Matrix	Collected	HOUSTON ClO4 DOD/6850
E2000092-001	LH18/24-SP650_020420_BIX	Water	02/04/20 1400	II

Service Request Summary

Folder #:	**E2000092**
Client Name:	ALS Environmental - US
Project Name:	HS20020147
Project Number:	

Report To:	RJ Modashia ALS Laboratory Group 10450 Stancliff Road Houston, TX 77099-4338 USA
Phone Number:	281-530-5656
Cell Number:	
Fax Number:	281-530-5887
E-mail:	rj.modashia@alsglobal.com

Project Chemist:	Corey Grandits
Originating Lab:	HOUSTON
Logged By:	CGRANDITS
Date Received:	02/05/20
Internal Due Date:	2/19/2020
QAP:	LAB QAP
Qualifier Set:	Lab Standard
Formset:	Lab Standard
Merged?:	N
Report to MDL?:	Y
P.O. Number:	HS20020147
EDD:	No EDD Specified

1 250 mL-Plastic Bottle HDPE WM CLEAR Unpreserved

Location: EHRMS-WIC 2B

Pressure Gas:

Data Qualifiers

Lab Standard

+	Possible Tedlar bag artifact.
A	TIC is a suspected aldol-condensation product
B	Analyte found in the associated method blank as well as in the sample.
BC	Reported results are not blank corrected.
BH	The back section of the tube yielded higher results than the front.
BT	Results indicated possible breakthrough; back section >=10% front section.
C	Result identification confirmed.
D	Compound identified in an analysis at a secondary dilution factor
D	Spike was diluted out
DE	Reported results are corrected for desorption efficiency.
E	Estimated value. Concentration above calibration range
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
H1	Sample analysis performed past holding time. See case narrative.
H2	Initial analysis within holding time. Reanalysis for the required dilution was past holding time.
H3	Sample was received and analyzed past holding time.
H4	Sample was extracted past required extraction holding time, but analyzed within analysis holding time. See case narrative.
I	Internal standard not within the specified limits. See case narrative.
J	Estimated Value. Concentration found below MRL.
K	A deflection in the QC ion may indicate interference with the quantitation of this ion. The concentration of this analyte should be considered as an estimate.
K	Analyte was detected above the method reporting limit prior to normalization.
L1	Laboratory control sample recovery outside the specified limits; results may be biased high.
L2	Laboratory control sample recovery outside the specified limits; results may be biased low.
L3	Laboratory control sample recovery outside the specified limits.
M	Matrix interference; results may be biased high.
M	The duplicate injection precision not met.
M1	Matrix interference due to coelution with a non-target compound; results may be biased high.
N	Presumptive evidence of a compound for TICs that have been identified based on a mass spectral library search.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.
P	Indicates chlorodiphenyl ether interference present at the retention time of the target compound.
P	Pesticide/Aroclor target analyte > 40% difference for detected concentrations between GC columns
Q	Indicates as estimated value because the P and P + 2 theoretical abundance ratio does not meet method criteria.
R	Duplicate Precision not met.
R1	Duplicate precision not within the specified limits; however, the results are below the MRL and considered estimated.
S	Surrogate recovery not within specified limits.

Data Qualifiers

Lab Standard

S	The reported value was determined by the Method of Standard Additions (MSA).
T	Analyte is a tentatively identified compound, result is estimated.
U	Compound was analyzed for, but was not detected (ND).
V1	The continuing calibration verification standard was outside (biased high) the specified limits for this compound.
V2	The continuing calibration verification standard was outside (biased low) the specified limits for this compound.
W	Result quantified, but the corresponding peak was detected outside the generated retention time window.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
X	See case narrative.
Y	Recovery outside limits
Y	The chromatogram resembles a petroleum product but does not match the calibration standard.
Z	The chromatogram does not resemble a petroleum product.
i	The MRL/MDL has been elevated due to a matrix interference.

ALS Laboratory Group

Acronyms

Cal	Calibration
Conc	CONCentration
Dioxin(s)	Polychlorinated dibenzo-p-dioxin(s)
EDL	Estimated Detection Limit
EMPC	Estimated Maximum Possible Concentration
Flags	Data qualifiers
Furan(s)	Polychlorinated dibenzofuran(s)
g	Grams
ICAL	Initial CALibration
ID	IDentifier
Ions	Masses monitored for the analyte during data acquisition
L	Liter (s)
LCS	Laboratory Control Sample
DLCS	Duplicate Laboratory Control Sample
MB	Method Blank
MCL	Method Calibration Limit
MDL	Method Detection Limit
mL	Milliliters
MS	Matrix Spiked sample
DMS	Duplicate Matrix Spiked sample
NO	Number of peaks meeting all identification criteria
PCDD(s)	Polychlorinated dibenzo-p-dioxin(s)
PCDF(s)	Polychlorinated dibenzofuran(s)
ppb	Parts per billion
ppm	Parts per million
ppq	Parts per quadrillion
ppt	Parts per trillion
QA	Quality Assurance
QC	Quality Control
Ratio	Ratio of areas from monitored ions for an analyte
% Rec.	Percent recovery
RPD	Relative Percent Difference
RRF	Relative Response Factor
RT	Retention Time
SDG	Sample Delivery Group
S/N	Signal-to-noise ratio
TEF	Toxicity Equivalence Factor
TEQ	Toxicity Equivalence Quotient

10450 Stancliff Rd, Houston, TX 77099 | 281-530-5656 | www.alsglobal.com

ALS Environmental

State Certifications, Accreditations, and Licenses

Agency	Number	Expire Date
Arizona Department of Health Services	AZ0793	5/27/2020
Arkansas Department of Environmental Quality	19-028-0	3/27/2020
California Department of Health Services	2919	4/30/2020
Department of Defense	A2LA 2897.01	11/30/2021
Florida Department of Health	E87611	6/30/2020
Hawaii Department of Health	TX02694	4/30/2020
Illinois Environmental Protection Agency	2000322019-2	5/9/2020
Kansas Department of Health and Environment	E-10352	7/31/2020
Louisiana Department of Environmental Quality	03087	6/30/2020
Louisiana Department of Health and Hospitals	LA028-2020	12/31/2020
Maine Center for Disease Control and Prevention	201815	6/5/2020
Maryland Department of the Environment	343	6/30/2020
Minnesota Department of Health	1785988	12/31/2020
Nebraska Department of Health and Human Services	NE-OS-25-13	4/30/2020
Nevada Department of Concervation and Natural Resources	TX026932019-1	7/31/2020
New Hampshire Environmental Laboratory Accreditation Program	209419	4/24/2020
New Jersey Department of Environmental Protection	NLC190001	6/30/2020
New York Department of Health	11707	3/31/2020
Oklahoma Department of Environmental Quality	2019-067	8/31/2020
Pennsylvania Department of Environmental Protection	68-03441-013	6/30/2020
Tennessee Department of Environment and Concervation	04016	6/30/2020
Texas Commision on Environmental Quality	TX104704231-19-25	4/30/2020
United States Department of Agriculture	P330-19-00299	10/10/2022
Utah Department of Health Environmental Laboratory Certification	TX026932019-9	7/31/2020
Washington Department of Health	C819	11/14/2020
West Virginia Department of Environmental Protection	347	6/30/2020

Chain of Custody

ALS Environmental - Houston HRMS
10450 Stancliff Rd, Suite 210, Houston TX 77099
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Houston, TX 77099
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Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** E2000092 5 **ID:** **13282**

ALS Laboratory Group
HS20020147

SUBCONTRACT TO:

ALS Environmental
10450 Stancliff RoadSuite 210
Houston, TX 77084

Phone: +1 281 530 5656

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: HS20020147
TSR: Danielle Winnings

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS20020147-02**	**LH18/24-SP650_020420_BIX**	**Water**	**04 Feb 2020 14:00**
	SUB_Perch-6850			13 Feb 2020

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. Mayan Date/Time: 2/5/20 11:45

Received By: LORET G Date/Time: 2/5/20 11:45

Cooler ID(s): Temperature(s):

ALS Environmental

Cooler Receipt Form

Project Chemist CG

Client/Project ALS-H

Thermometer ID SNUM

Date/Time Received: 2-9-20 Initials: CG

Date/Time Logged in: 2/9/20 Initials CG

1. Method of delivery: ○ US Mail ○ Fed Ex ○ UPS ○ DHL ✓ Courier (ALS) ○ Client

2. Samples received in: ✓ Cooler ○ Box ○ Envelope ○ Other

3. Were custody seals on coolers? ○ Yes ✓ No

If yes, how many and where?

Were they intact? ○ Yes ○ No ✓ N/A

Were they signed and dated? ○ Yes ○ No ✓ N/A

4. Packing Material: ○ Inserts ○ Baggies ○ Bubble Wrap ○ Gel Packs ✓ Wet Ice ○ Sleeves ○ Other

5. Foreign or Regulated Soil? ○ Yes ○ No Location of Sampling:

Cooler Tracking Number	COC ID	Date Opened	Time Opened	Opened By	Temp. °C	Temp Blank?
		2/9/20	1145	CG	2.5/2.9	☒
						☐
						☐
						☐

6. Were custody papers properly filled out (ink, signed, dated, etc)? ✓ Yes ○ No

7. Did all bottles arrive in good condition (not broken, no signs of leakage)? ✓ Yes ○ No

8. Were all sample labels complete (i.e., sample ID, analysis, preservation, etc)? ✓ Yes ○ No

9. Were appropriate bottles/containers and volumes received for the requested tests? ✓ Yes ○ No

10. Did sample labels and tags agree with custody documents? ✓ Yes ○ No

Notes, Discrepancies, & Resolutions:

Service request Label: E2000092 5

ALS Laboratory Group HS20020147

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SAMPLE ACCEPTANCE POLICY

This policy outlines the criteria samples must meet to be accepted by ALS Environmental – Houston HRMS.

Cooler Custody Seals (desirable, mandatory if specified in SAP):

- ✓ Intact on outside of cooler, signed and dated

Chain-of-Custody (COC) documentation (mandatory):

The following is required on each COC:

- ✓ Sample ID, the location, date and time of collection, collector's name, preservation type, sample type, and any other special remarks concerning the sampleThe COC must be completed in ink.
- ✓ Signature and date of relinquishing party.

In the absence of a COC at sample receipt, the COC will be requested from the client.

Sample Integrity (mandatory):

Samples are inspected upon arrival to ensure that sample integrity was not compromised during transfer to the laboratory.

- ✓ Sample containers must arrive in good condition (not broken or leaking).
- ✓ Samples must be labeled appropriately, including Sample IDs, and requested test using durable labels and indelible ink.
- ✓ The correct type of sample bottle must be used for the method requested.
- ✓ An appropriate sample volume, or weight, must be received.
- ✓ Sample IDs and number of containers must reconcile with the COC.
- ✓ Samples must be received within the method defined holding time.

Temperature Requirement (varies by sample matrix):

- ✓ Aqueous and Non-aqueous samples must be shipped and stored cold, at 0 to 6ºC.
- ✓ Tissue samples must be shipped and stored frozen, at -20 to -10ºC.
- ✓ Air samples are shipped and stored cold, at 0 to 6ºC
- ✓ The sample temperature must be recorded on the COC

All cooler inspections are documented on the Cooler Receipt Form (CRF). A separate CRF is completed for each service request. Any samples not meeting the above criteria are noted on the CRF and the Project Manager notified. The Project Manager must resolve any sample integrity issues with the client prior to proceeding with the analysis. Such resolutions are documented in writing and filed with the project folder. Data associated with samples received outside of this acceptance policy will be qualified on the case narrative of the final report

Preparation Information Benchsheets

ALS Environmental - Houston HRMS
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Preparation Information Benchsheet

Prep Run#: 353630 **Prep WorkFlow:** GenExt28Day **Status:** Prepped
Team: Semivoa GCMS/KBROWN **Prep Method:** Method **Prep Date/Time:** 2/11/20 13:46

#	Lab Code	Client ID	B#	Method /Test	pH	Cl	Matrix	Amt. Ext.	Sample Description
1	E2000074-001	LH18/24-SP650_12320_BIX	.01	6850/ClO4 DOD			Water	10mL	
2	E2000075-001	HBW7_012020	.01	6850/ClO4 DOD			Surface Water	10mL	
3	E2000075-002	HBW10_012020	.01	6850/ClO4 DOD			Surface Water	10mL	
4	E2000075-003	HBW1_012020	.01	6850/ClO4 DOD			Surface Water	10mL	
5	E2000075-004	GPW1_012020	.01	6850/ClO4 DOD			Surface Water	10mL	
6	E2000075-005	GPW1_012020_a	.01	6850/ClO4 DOD			Surface Water	10mL	
7	E2000075-006	GPW3_012020	.01	6850/ClO4 DOD			Surface Water	10mL	
8	E2000076-001	LH18/24-SP650_12820_BIX	.01	6850/ClO4 DOD			Water	10mL	
9	E2000087-001	GW-MW-85-20200129-01	.01	6850/ClO4			Water	10mL	
10	E2000087-002	GW-MW-84-20200129-01	.01	6850/ClO4			Water	10mL	
11	E2000087-003	EB-001-20200129-01	.01	6850/ClO4			Water	10mL	
12	E2000092-001	LH18/24-SP650_020420_BIX	.01	6850/ClO4 DOD			Water	10mL	
13	EQ2000051-01	MB		6850/ClO4 DOD			Liquid	10mL	
14	EQ2000051-02	LCS		6850/ClO4 DOD			Liquid	10mL	
15	EQ2000051-03	DLCS		6850/ClO4 DOD			Liquid	10mL	

Spiking Solutions

Name: Sodium Perchlorate 1 ug/mL (IS) (18-O) as CLO4 Inventory ID 202037 Logbook Ref: Sodium Perchlorate Expires On: 05/22/2021

E2000074-001	100.00µL	E2000075-001	100.00µL	E2000075-002	100.00µL	E2000075-003	100.00µL	E2000075-004	100.00µL	E2000075-005	100.00µL
E2000075-006	100.00µL	E2000076-001	100.00µL	E2000087-001	100.00µL	E2000087-002	100.00µL	E2000087-003	100.00µL	E2000092-001	100.00µL
EQ2000051-01	100.00µL	EQ2000051-01	100.00µL	EQ2000051-02	0.10µL	EQ2000051-02	0.10µL	EQ2000051-03	0.10µL	EQ2000051-03	0.10µL

Name: Perchlorate Intermediate Stock1 Inventory ID 204799 Logbook Ref: 200657 1.0ug/mL KN Expires On: 05/15/2020

EQ2000051-02	10.00µL	EQ2000051-02	10.00µL	EQ2000051-03	10.00µL	EQ2000051-03	10.00µL

Preparation Steps

Step: Preparation
Started: 2/11/20 13:46
Finished: 2/11/20 15:00
By: KBROWN
Comments

Comments:

Preparation Information Benchsheet

Prep Run#: 353630
Team: Semivoa GCMS/KBROWN

Prep WorkFlow: GenExt28Day
Prep Method: Method

Status: Prepped
Prep Date/Time: 2/11/20 13:46

Reviewed By: KB Date: 02/12/2020

Chain of Custody

Relinquished By: _____ Date: _____

Received By: _____ Date: _____

Extracts Examined
Yes No

Analytical Results

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ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2000092
Project:	HS20020147	**Date Collected:**	2/ 4/20 1400
Sample Matrix:	Water	**Date Received:**	2/ 5/20
		Date Extracted:	2/11/20
		Date Analyzed:	2/17/20 15:18
Sample Name:	LH18/24-SP650_020420_BIX	**Units:**	µg/L
Lab Code:	E2000092-001	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method:	6850	**Analysis Lot:**	670318
Prep Method:	Method	**Extraction Lot:**	353630
Data File Name:	I:\LCMS01\DATA\20200217\20200217_034	**Instrument Name:**	E-LCMS-01
		Dilution Factor:	1

CAS No.	Analyte Name	Result	Q	LOQ	LOD	MDL	Note
14797-73-0	Perchlorate	**0.140**		0.100	0.0500	0.0250	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2000092
Project:	HS20020147	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
		Date Extracted:	2/11/20
		Date Analyzed:	2/17/20 11:42
Sample Name:	Method Blank	**Units:**	µg/L
Lab Code:	EQ2000051-01	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method:	6850	**Analysis Lot:**	670318
Prep Method:	Method	**Extraction Lot:**	353630
Data File Name:	I:\LCMS01\DATA\20200217\20200217_009	**Instrument Name:**	E-LCMS-01
		Dilution Factor:	1

CAS No.	Analyte Name	Result	Q	LOQ	LOD	MDL	Note
14797-73-0	Perchlorate	ND	U	0.100	0.0500	0.0250	

Accuracy & Precision

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ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: HS20020147
Sample Matrix: Water

Service Request: E2000092
Date Analyzed: 2/17/20

Lab Control Sample Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Units: µg/L
Basis: NA

Extraction Lot: 353630

	Lab Control Sample EQ2000051-02			Duplicate Lab Control Sample EQ2000051-03					
Analyte Name	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Perchlorate	0.855	1.00	86	0.842	1.00	84	84 - 119	2	15

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

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

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2000092
Project:	HS20020147	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
		Date Extracted:	2/11/20
		Date Analyzed:	2/17/20 14:15
Sample Name:	Lab Control Sample	**Units:**	µg/L
Lab Code:	EQ2000051-02	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method:	6850	**Analysis Lot:**	670318
Prep Method:	Method	**Extraction Lot:**	353630
Data File Name:	I:\LCMS01\DATA\20200217\20200217_026	**Instrument Name:**	E-LCMS-01
		Dilution Factor:	1

CAS No.	Analyte Name	Result	Q	LOQ	LOD	MDL	Note
14797-73-0	Perchlorate	**0.855**		0.100	0.0500	0.0250	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2000092
Project:	HS20020147	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
		Date Extracted:	2/11/20
		Date Analyzed:	2/17/20 16:15
Sample Name:	Duplicate Lab Control Sample	**Units:**	µg/L
Lab Code:	EQ2000051-03	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method:	6850	**Analysis Lot:**	670318
Prep Method:	Method	**Extraction Lot:**	353630
Data File Name:	I:\LCMS01\DATA\20200217\20200217_035	**Instrument Name:**	E-LCMS-01
		Dilution Factor:	1

CAS No.	Analyte Name	Result	Q	LOQ	LOD	MDL	Note
14797-73-0	Perchlorate	**0.842**		0.100	0.0500	0.0250	

Initial Calibration

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20191230

ICAL Date: 12/30/2019
Cal. Std. xp: 5/14/2020
ICAL ID: **EC2000001**

1st Review: Kneir
2nd Review: Hvan

ALS Environmental
LCMS01 -Shimadzu 8050

Mobile Phases **A:** 0.75% Formic Acid/Water 3100803-09 **B:** MeOH 3100802-01

	Sample Name		File Name	Acquisition Method	Dilution	R	Comments	Date/Time
	null	null	20191230_001	Perchlorate6850b.lcm	1x	☒		12/30/2019 10:02
	null	null	20191230_002	Perchlorate6850b.lcm	1x	☒		12/30/2019 10:07
	DIBLK	DIBLK	20191230_003	Perchlorate6850b.lcm	1x	☒		12/30/2019 10:12
	DIBLK	DIBLK	20191230_004	Perchlorate6850b.lcm	1x	☒		12/30/2019 10:20
	IB	IB	20191230_005	Perchlorate6850b.lcm	1x	☒		12/30/2019 10:28
	PERCHLORATE7	PERCHLORATE7	20191230_006	Perchlorate6850b.lcm	1x	☒	3100805-02	12/30/2019 10:48
	PERCHLORATE1	PERCHLORATE1	20191230_007	Perchlorate6850b.lcm	1x	☒	3100804-05	12/30/2019 10:56
	PERCHLORATE2	PERCHLORATE2	20191230_008	Perchlorate6850b.lcm	1x	☒	3100804-06	12/30/2019 11:04
	PERCHLORATE3	PERCHLORATE3	20191230_009	Perchlorate6850b.lcm	1x	☒	3100804-07	12/30/2019 11:12
	PERCHLORATE4	PERCHLORATE4	20191230_010	Perchlorate6850b.lcm	1x	☒	3100804-08	12/30/2019 11:19
	PERCHLORATE5	PERCHLORATE5	20191230_011	Perchlorate6850b.lcm	1x	☒	3100804-09	12/30/2019 11:27
	PERCHLORATE6	PERCHLORATE6	20191230_012	Perchlorate6850b.lcm	1x	☒	3100805-01	12/30/2019 11:35
	PERCHLORATE8	PERCHLORATE8	20191230_013	Perchlorate6850b.lcm	1x	☒	3100805-03	12/30/2019 11:43
	PERCHLORATE9	PERCHLORATE9	20191230_014	Perchlorate6850b.lcm	1x	☒	3100805-04	12/30/2019 11:51
	PERCHLORATE10	PERCHLORATE10	20191230_015	Perchlorate6850b.lcm	1x	☒	3100805-05	12/30/2019 11:59
	ICV	ICV	20191230_016	Perchlorate6850b.lcm	1x	☒	3100805-06	12/30/2019 12:07
	EQ1900442-01	EQ1900442-01	20191230_017	Perchlorate6850b.lcm	1x	☒		12/30/2019 14:01
	EQ1900442-02	EQ1900442-02	20191230_018	Perchlorate6850b.lcm	1x	☒		12/30/2019 14:09
	EQ1900442-03	EQ1900442-03	20191230_019	Perchlorate6850b.lcm	1x	☒		12/30/2019 14:17
	EQ1900442-04	EQ1900442-04	20191230_020	Perchlorate6850b.lcm	1x	☒		12/30/2019 14:25
	EQ1900442-05	EQ1900442-05	20191230_021	Perchlorate6850b.lcm	1x	☒		12/30/2019 14:33
	E1900912-001	E1900912-001	20191230_022	Perchlorate6850b.lcm	1x	☒		12/30/2019 14:41
	E1900912-002	E1900912-002	20191230_023	Perchlorate6850b.lcm	1x	☒		12/30/2019 14:49
	CCV	CCV	20191230_024	Perchlorate6850b.lcm	1x	☒	3100805-02	12/30/2019 14:57
	E1900912-001X1000	E1900912-001X1000	20191230_025	Perchlorate6850b.lcm	1000	☒		12/30/2019 17:06
	E1900912-002X100	E1900912-002X100	20191230_026	Perchlorate6850b.lcm	100	☒		12/30/2019 17:14
	CCV	CCV	20191230_027	Perchlorate6850b.lcm	1x	☒	3100805-02	12/30/2019 17:22

Initial Calibration - Detailed Report

Calibration ID: EC2000001 **Instrument ID:** E-LCMS-01
Column Name: 1

#	Lab Code	Sample Name	File Location	Aquisition Date
07	EC2000001-07	PERCHLORATE7	20191230_006	12/30/2019 10:48
01	EC2000001-01	PERCHLORATE1	20191230_007	12/30/2019 10:56
02	EC2000001-02	PERCHLORATE2	20191230_008	12/30/2019 11:04
03	EC2000001-03	PERCHLORATE3	20191230_009	12/30/2019 11:12
04	EC2000001-04	PERCHLORATE4	20191230_010	12/30/2019 11:19
05	EC2000001-05	PERCHLORATE5	20191230_011	12/30/2019 11:27
06	EC2000001-06	PERCHLORATE6	20191230_012	12/30/2019 11:35
08	EC2000001-08	PERCHLORATE8	20191230_013	12/30/2019 11:43
09	EC2000001-09	PERCHLORATE9	20191230_014	12/30/2019 11:51
10	EC2000001-10	PERCHLORATE10	20191230_015	12/30/2019 11:59

Analyte **Curve Fit** **Weighting**

Perchlorate **Average RF** **RSD = 10.79** **Average RF = 0.1352**

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.1000	0.1736	02	0.5000	0.1222	03	0.7000	0.1219	04	1.0000	0.1363
05	2.0000	0.1337	06	5.0000	0.1268	07	10.0000	0.1373	08	20.0000	0.1349
09	30.0000	0.133	10	50.0000	0.1325						

Analyte

Perchlorate

#	Amount	Calculated Conc	%D	#	Amount	Calculated Conc	%D	#	Amount	Calculated Conc	%D
01	0.1000	0.128	28.4	02	0.5000	0.452	-9.6	03	0.7000	0.631	-9.9
04	1.0000	1.01	0.8	05	2.0000	1.98	-1.1	06	5.0000	4.69	-6.2
07	10.0000	10.2	1.6	08	20.0000	20.0	-0.2	09	30.0000	29.5	-1.6
10	50.0000	49.0	-2.0								

Initial Calibration Verification Summary Report

Calibration ID:	EC2000001	**Instrument ID:**	E-LCMS-01
Datafile ID:	20191230_016	**Column Name:**	1

Analyte	Lab Code	Type	Curve Fit	True Value	Calc Conc	Units	Result	Criteria
Perchlorate	EC2000001-11	T	Average RF	10	12.276	ng/mL	22.7	<= 25

ALS Group Houston

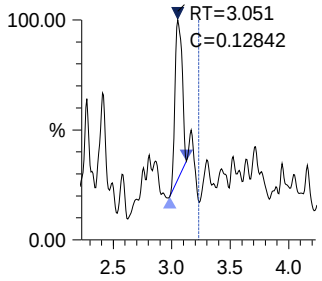
PERCHLORATE1

Date acquired: 12/30/2019 10:56:14 AM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20191230\20191230_007.lcd
Vial: 3 | Inj. Volume: 25.0000uL | Tray: 1

Name	Data Filename	Sample ID	Found RT	Area	Conc.	Acquired Date	Cal Point	Dil. Factor	Inj Vol	ISTD Area	Tray	Vial
Perchlorate	20191230_007	PERCHLORATE1	3.051	4022	0.12842	12/30/2019 10:56:14 AM	Yes	1.00000	25.0000	231680	1	3
Sodium Perchlorate-18O4_IS	20191230_007	PERCHLORATE1	3.051	231680	1.00000	12/30/2019 10:56:14 AM	No	1.00000	25.0000	231680	1	3

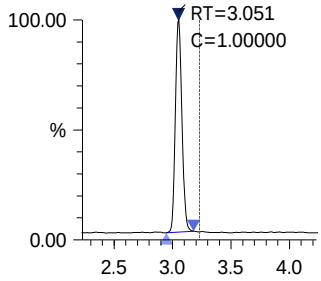
Perchlorate

Conc 0.12842
Area 4022
Q 99.00>83.00 (-) 1.27e3



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 231680
ISTD 107.00>89.00 (-) 5.94e4



ALS Group Houston

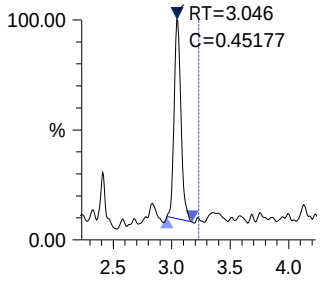
PERCHLORATE2

Date acquired: 12/30/2019 11:04:09 AM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20191230\20191230_008.lcd
Vial: 4 | Inj. Volume: 25.0000uL | Tray: 1

Name	Data Filename	Sample ID	Found RT	Area	Conc.	Acquired Date	Cal Point	Dil. Factor	Inj Vol	ISTD Area	Tray	Vial
Perchlorate	20191230_008	PERCHLORATE2	3.046	15985	0.45177	12/30/2019 11:04:09 AM	Yes	1.00000	25.0000	261704	1	4
Sodium Perchlorate-18O4_IS	20191230_008	PERCHLORATE2	3.045	261704	1.00000	12/30/2019 11:04:09 AM	No	1.00000	25.0000	261704	1	4

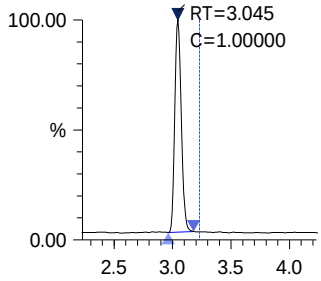
Perchlorate

Conc 0.45177
Area 15985
Q 99.00>83.00 (-) 4.21e3



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 261704
ISTD 107.00>89.00 (-) 6.75e4



ALS Group Houston

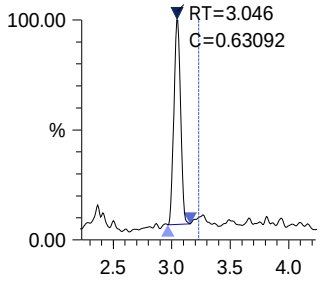
PERCHLORATE3

Date acquired: 12/30/2019 11:12:06 AM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20191230\20191230_009.lcd
Vial: 5 | Inj. Volume: 25.0000uL | Tray: 1

Name	Data Filename	Sample ID	Found RT	Area	Conc.	Acquired Date	Cal Point	Dil. Factor	Inj Vol	ISTD Area	Tray	Vial
Perchlorate	20191230_009	PERCHLORATE3	3.046	22031	0.63092	12/30/2019 11:12:06 AM	Yes	1.00000	25.0000	258274	1	5
Sodium Perchlorate-18O4_IS	20191230_009	PERCHLORATE3	3.044	258274	1.00000	12/30/2019 11:12:06 AM	No	1.00000	25.0000	258274	1	5

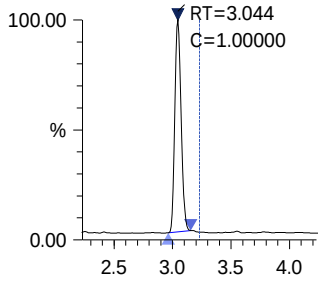
Perchlorate

Conc 0.63092
Area 22031
Q 99.00>83.00 (-) 5.75e3



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 258274
ISTD 107.00>89.00 (-) 6.88e4



ALS Group Houston

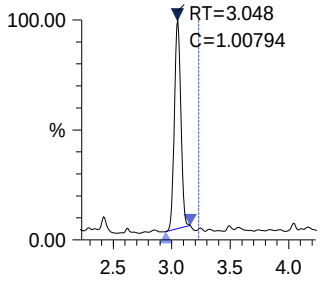
PERCHLORATE4

Date acquired: 12/30/2019 11:19:58 AM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20191230\20191230_010.lcd
Vial: 6 | Inj. Volume: 25.0000uL | Tray: 1

Name	Data Filename	Sample ID	Found RT	Area	Conc.	Acquired Date	Cal Point	Dil. Factor	Inj Vol	ISTD Area	Tray	Vial
Perchlorate	20191230_010	PERCHLORATE4	3.048	36488	1.00794	12/30/2019 11:19:58 AM	Yes	1.00000	25.0000	267754	1	6
Sodium Perchlorate-18O4_IS	20191230_010	PERCHLORATE4	3.046	267754	1.00000	12/30/2019 11:19:58 AM	No	1.00000	25.0000	267754	1	6

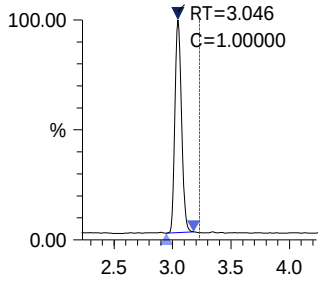
Perchlorate

Conc 1.00794
Area 36488
Q 99.00>83.00 (-) 9.73e3



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 267754
ISTD 107.00>89.00 (-) 6.78e4



ALS Group Houston

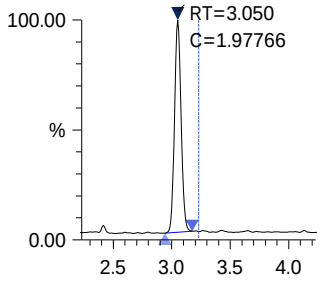
PERCHLORATE5

Date acquired: 12/30/2019 11:27:53 AM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20191230\20191230_011.lcd
Vial: 7 | Inj. Volume: 25.0000uL | Tray: 1

Name	Data Filename	Sample ID	Found RT	Area	Conc.	Acquired Date	Cal Point	Dil. Factor	Inj Vol	ISTD Area	Tray	Vial
Perchlorate	20191230_011	PERCHLORATE5	3.050	74631	1.97766	12/30/2019 11:27:53 AM	Yes	1.00000	25.0000	279118	1	7
Sodium Perchlorate-18O4_IS	20191230_011	PERCHLORATE5	3.046	279118	1.00000	12/30/2019 11:27:53 AM	No	1.00000	25.0000	279118	1	7

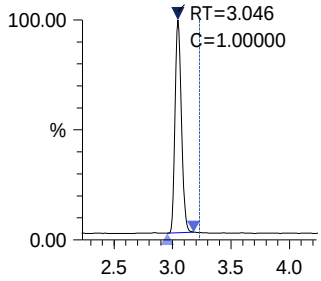
Perchlorate

Conc 1.97766
Area 74631
Q 99.00>83.00 (-) 1.92e4



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 279118
ISTD 107.00>89.00 (-) 7.33e4



ALS Group Houston

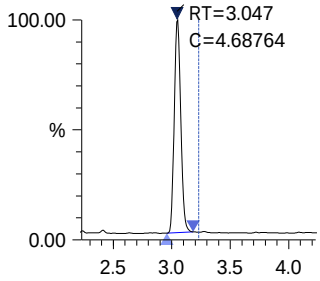
PERCHLORATE6

Date acquired: 12/30/2019 11:35:50 AM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20191230\20191230_012.lcd
Vial: 8 | Inj. Volume: 25.0000uL | Tray: 1

Name	Data Filename	Sample ID	Found RT	Area	Conc.	Acquired Date	Cal Point	Dil. Factor	Inj Vol	ISTD Area	Tray	Vial
Perchlorate	20191230_012	PERCHLORATE6	3.047	159122	4.68764	12/30/2019 11:35:50 AM	Yes	1.00000	25.0000	251072	1	8
Sodium Perchlorate-18O4_IS	20191230_012	PERCHLORATE6	3.045	251072	1.00000	12/30/2019 11:35:50 AM	No	1.00000	25.0000	251072	1	8

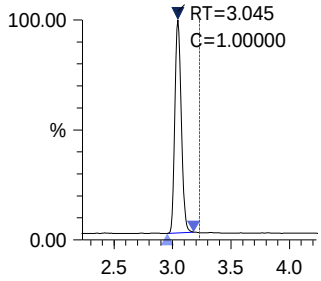
Perchlorate

Conc 4.68764
Area 159122
Q 99.00>83.00 (-) 4.12e4



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 251072
ISTD 107.00>89.00 (-) 6.53e4



ALS Group Houston

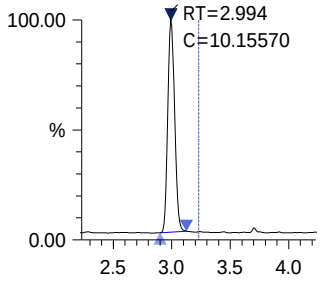
PERCHLORATE7

Date acquired: 12/30/2019 10:48:20 AM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20191230\20191230_006.lcd
Vial: 9 | Inj. Volume: 25.0000uL | Tray: 1

Name	Data Filename	Sample ID	Found RT	Area	Conc.	Acquired Date	Cal Point	Dil. Factor	Inj Vol	ISTD Area	Tray	Vial
Perchlorate	20191230_006	PERCHLORATE7	2.994	298821	10.15570	12/30/2019 10:48:20 AM	Yes	1.00000	25.0000	217632	1	9
Sodium Perchlorate-18O4_IS	20191230_006	PERCHLORATE7	2.991	217632	1.00000	12/30/2019 10:48:20 AM	No	1.00000	25.0000	217632	1	9

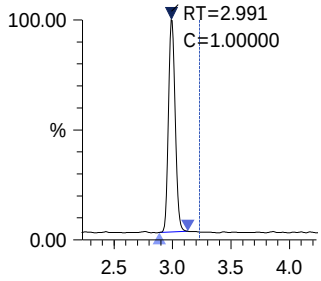
Perchlorate

Conc 10.15570
Area 298821
Q 99.00>83.00 (-) 7.46e4



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 217632
ISTD 107.00>89.00 (-) 5.38e4



ALS Group Houston

PERCHLORATE8

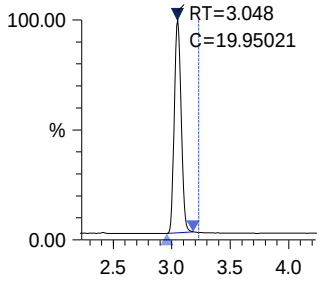
Date acquired: 12/30/2019 11:43:47 AM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20191230\20191230_013.lcd
Vial: 10 | Inj. Volume: 25.0000uL | Tray: 1

Name	Data Filename	Sample ID	Found RT	Area	Conc.	Acquired Date	Cal Point	Dil. Factor	Inj Vol	ISTD Area	Tray	Vial
Perchlorate	20191230_013	PERCHLORATE8	3.048	557358	19.95021	12/30/2019 11:43:47 AM	Yes	1.00000	25.0000	206636	1	10
Sodium Perchlorate-18O4_IS	20191230_013	PERCHLORATE8	3.045	206636	1.00000	12/30/2019 11:43:47 AM	No	1.00000	25.0000	206636	1	10

Perchlorate

Conc 19.95021
Area 557358

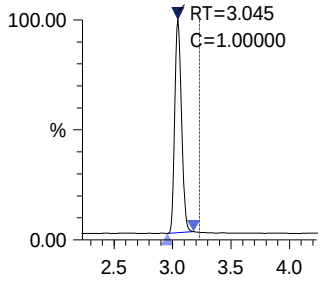
Q 99.00>83.00 (-) 1.37e5



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 206636

ISTD 107.00>89.00 (-) 5.11e4



ALS Group Houston

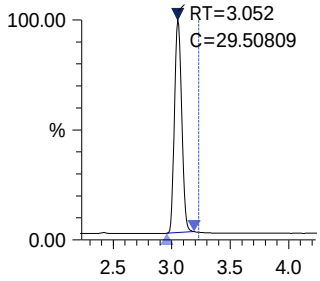
PERCHLORATE9

Date acquired: 12/30/2019 11:51:43 AM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20191230\20191230_014.lcd
Vial: 11 | Inj. Volume: 25.0000uL | Tray: 1

Name	Data Filename	Sample ID	Found RT	Area	Conc.	Acquired Date	Cal Point	Dil. Factor	Inj Vol	ISTD Area	Tray	Vial
Perchlorate	20191230_014	PERCHLORATE9	3.052	730647	29.50809	12/30/2019 11:51:43 AM	Yes	1.00000	25.0000	183142	1	11
Sodium Perchlorate-18O4_IS	20191230_014	PERCHLORATE9	3.049	183142	1.00000	12/30/2019 11:51:43 AM	No	1.00000	25.0000	183142	1	11

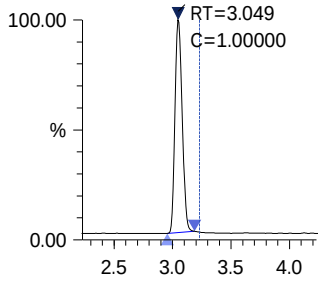
Perchlorate

Conc 29.50809
Area 730647
Q 99.00>83.00 (-) 1.70e5



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 183142
ISTD 107.00>89.00 (-) 4.27e4



ALS Group Houston

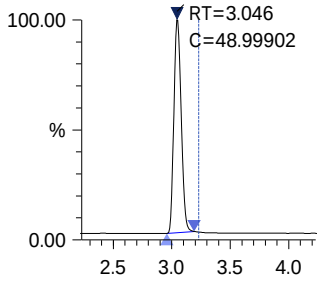
PERCHLORATE10

Date acquired: 12/30/2019 11:59:38 AM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20191230\20191230_015.lcd
Vial: 12 | Inj. Volume: 25.0000uL | Tray: 1

Name	Data Filename	Sample ID	Found RT	Area	Conc.	Acquired Date	Cal Point	Dil. Factor	Inj Vol	ISTD Area	Tray	Vial
Perchlorate	20191230_015	PERCHLORATE10	3.046	1090166	48.99902	12/30/2019 11:59:38 AM	Yes	1.00000	25.0000	164560	1	12
Sodium Perchlorate-18O4_IS	20191230_015	PERCHLORATE10	3.043	164560	1.00000	12/30/2019 11:59:38 AM	No	1.00000	25.0000	164560	1	12

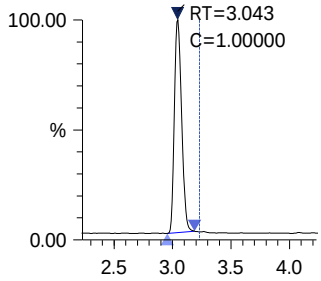
Perchlorate

Conc 48.99902
Area 1090166
Q 99.00>83.00 (-) 2.51e5



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 164560
ISTD 107.00>89.00 (-) 3.80e4



ALS Group Houston

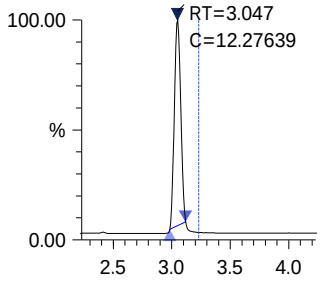
ICV

Date acquired: 12/30/2019 12:07:32 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20191230\20191230_016.lcd
Vial: 13 | Inj. Volume: 25.0000uL | Tray: 1

Name	Data Filename	Sample ID	Found RT	Area	Conc.	Acquired Date	Cal Point	Dil. Factor	Inj Vol	ISTD Area	Tray	Vial
Perchlorate	20191230_016	ICV	3.047	347932	12.27639	12/30/2019 12:07:32 PM	No	1.00000	25.0000	209626	1	13
Sodium Perchlorate-18O4_IS	20191230_016	ICV	3.045	209626	1.00000	12/30/2019 12:07:32 PM	No	1.00000	25.0000	209626	1	13

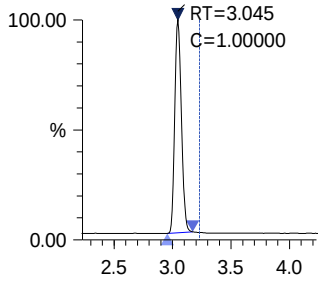
Perchlorate

Conc 12.27639
Area 347932
Q 99.00>83.00 (-) 9.49e4



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 209626
ISTD 107.00>89.00 (-) 5.28e4



Chromatograms and Selected Ion Monitoring

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 320, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

20200217

1st Review: Kneir
2nd Review: Hvan

ALS Environmental
LCMS01 -Shimadzu 8050

ICAL Date: 12/30/2019
Cal. Std. xp: 5/14/2020
ICAL ID: **EC2000001**

Mobile Phases **A:** 0.75% Formic Acid/Water 3100803-09 **B:** MeOH 3100802-01

	Sample Name		File Name	Acquisition Method	Dilution	R	Comments	Date/Time
	NULL		20200217_001	Perchlorate6850b.lcm	1x	☒		2/17/2020 10:47
	NULL		20200217_002	Perchlorate6850b.lcm	1x	☒		2/17/2020 10:52
	NULL		20200217_003	Perchlorate6850b.lcm	1x	☒		2/17/2020 10:57
	DIBLK		20200217_004	Perchlorate6850b.lcm	1x	☒		2/17/2020 11:02
	DIBLK		20200217_005	Perchlorate6850b.lcm	1x	☒		2/17/2020 11:10
	IB		20200217_006	Perchlorate6850b.lcm	1x	☒		2/17/2020 11:18
	PERCHLORATE7		20200217_007	Perchlorate6850b.lcm	1x	☒	3100805-02	2/17/2020 11:26
	LODV-0.5		20200217_008	Perchlorate6850b.lcm	1x	☒		2/17/2020 11:34
	EQ2000051-01		20200217_009	Perchlorate6850b.lcm	1x	☒		2/17/2020 11:42
	EQ2000051-02		20200217_010	Perchlorate6850b.lcm	1x	☒		2/17/2020 11:50
	EQ2000051-03RI		20200217_011	Perchlorate6850b.lcm	1x	☒	high IS-RR	2/17/2020 11:57
	E2000074-001		20200217_012	Perchlorate6850b.lcm	1x	☒		2/17/2020 12:05
	E2000075-001		20200217_013	Perchlorate6850b.lcm	1x	☒		2/17/2020 12:13
	E2000075-002		20200217_014	Perchlorate6850b.lcm	1x	☒		2/17/2020 12:21
	PERCHLORATE7		20200217_015	Perchlorate6850b.lcm	1x	☒	3100805-02	2/17/2020 12:29
	E2000075-003		20200217_016	Perchlorate6850b.lcm	1x	☒		2/17/2020 12:37
	E2000075-004RI		20200217_017	Perchlorate6850b.lcm	1x		high IS-RR	2/17/2020 12:45
	E2000075-005RI		20200217_018	Perchlorate6850b.lcm	1x		high IS-RR	2/17/2020 12:53
	E2000075-006RI		20200217_019	Perchlorate6850b.lcm	1x		high IS-RR	2/17/2020 13:01
	E2000076-001RI		20200217_020	Perchlorate6850b.lcm	1x		high IS-RR	2/17/2020 13:09
	E2000087-001RI		20200217_021	Perchlorate6850b.lcm	1x		high IS-RR	2/17/2020 13:16
	E2000087-002		20200217_022	Perchlorate6850b.lcm	1x	☒		2/17/2020 13:24
	E2000087-003RI		20200217_023	Perchlorate6850b.lcm	1x		high IS-RR	2/17/2020 13:32
	E2000092-001RI		20200217_024	Perchlorate6850b.lcm	1x		high IS-RR	2/17/2020 13:40
	PERCHLORATE7		20200217_25	Perchlorate6850b.lcm	1x	☒	3100805-02	2/17/2020 13:48
	LODV		20200217_026	Perchlorate6850b.lcm	1x	☒		2/17/2020 14:15
	LODV		20200217_027	Perchlorate6850b.lcm	1x	☒		2/17/2020 14:22
	E2000075-004		20200217_028	Perchlorate6850b.lcm	1x	☒		2/17/2020 14:30
	E2000075-005		20200217_029	Perchlorate6850b.lcm	1x	☒		2/17/2020 14:38
	E2000075-006		20200217_030	Perchlorate6850b.lcm	1x	☒		2/17/2020 14:46
	E2000076-001		20200217_031	Perchlorate6850b.lcm	1x	☒		2/17/2020 14:54
	E2000087-001		20200217_032	Perchlorate6850b.lcm	1x	☒		2/17/2020 15:02
	E2000087-003		20200217_033	Perchlorate6850b.lcm	1x	☒		2/17/2020 15:10
	E2000092-001		20200217_034	Perchlorate6850b.lcm	1x	☒		2/17/2020 15:18
	EQ2000051-03		20200217_035	Perchlorate6850b.lcm	1x	☒		2/17/2020 16:15
	PERCHLORATE7		20200217_036	Perchlorate6850b.lcm	1x	☒	3100805-02	2/17/2020 16:23

Internal Standard Summary

QAP: LAB QAP
Spec No: 12474 Ver. 1

Test: 6850/ClO4

Instrument ID: E-LCMS-01
Date Acquired: 2/17/20 11:26

Analysis Lot: 670318

		Sodium Perchlorate-18O4	
		Area	**RT**
	ICAL Average ==>	230,109	3.04
	Upper Limit ==>	345,164	5.04
	Lower Limit ==>	115,055	1.04
Associated Analyses			
20200217_0(EQ2000058-01	Continuing Calibration Ve	252,380	3.16
20200217_0(EQ2000051-01	Method Blank	158,257	3.16
20200217_01 EQ2000051-02	Lab Control Sample	255,372	3.16

Internal Standard Summary

QAP: LAB QAP
Spec No: 12474 Ver. 1

Test: 6850/ClO4

Instrument ID: E-LCMS-01
Date Acquired: 2/17/20 12:29

Analysis Lot: 670318

		Sodium Perchlorate-18O4	
		Area	**RT**
	ICAL Average ==>	230,109	3.04
	Upper Limit ==>	345,164	5.04
	Lower Limit ==>	115,055	1.04
Associated Analyses			
20200217_01 EQ2000058-02	Continuing Calibration Ve	282,852	3.16
20200217_02 E2000087-002	GW-MW-84-20200129-01	322,272	3.15

Internal Standard Summary

QAP: LAB QAP
Spec No: 12474 Ver. 1

Test: 6850/ClO4

Instrument ID: E-LCMS-01
Date Acquired: 2/17/20 13:48

Analysis Lot: 670318

			Sodium Perchlorate-18O4	
			Area	**RT**
		ICAL Average ==>	230,109	3.04
		Upper Limit ==>	345,164	5.04
		Lower Limit ==>	115,055	1.04
Associated Analyses				
20200217_02	EQ2000058-03	Continuing Calibration Ve	266,026	3.16
20200217_03	E2000087-001	GW-MW-85-20200129-01	301,657	3.15
20200217_03	E2000087-003	EB-001-20200129-01	253,755	3.16
20200217_03	EQ2000051-03	Duplicate Lab Control San	287,501	3.11

Internal Standard Summary

QAP: LAB QAP
Spec No: 12474 Ver. 1

Test: 6850/ClO4

Instrument ID: E-LCMS-01
Date Acquired: 2/17/20 16:23

Analysis Lot: 670318

		Sodium Perchlorate-18O4	
		Area	**RT**
	ICAL Average ==>	230,109	3.04
	Upper Limit ==>	345,164	5.04
	Lower Limit ==>	115,055	1.04
Associated Analyses			
20200217_03 EQ2000058-04	Continuing Calibration Ve	293,622	3.16

Internal Standard Summary

QAP: LAB QAP
Spec No: 99479 Ver. 1

Test: 6850/ClO4 DOD

Instrument ID: E-LCMS-01
Date Acquired: 2/17/20 11:26

Analysis Lot: 670318

		Sodium Perchlorate-18O4	
		Area	**RT**
	ICAL Average ==>	230,109	3.04
	Upper Limit ==>	345,164	5.04
	Lower Limit ==>	115,055	1.04
Associated Analyses			
20200217_0(EQ2000058-01	Continuing Calibration Ve	252,380	3.16
20200217_0(EQ2000051-01	Method Blank	158,257	3.16
20200217_01 EQ2000051-02	Lab Control Sample	255,372	3.16
20200217_01 E2000074-001	LH18/24-SP650_12320_E	338,697	3.14
20200217_01 E2000075-001	HBW7_012020	298,684	3.15
20200217_01 E2000075-002	HBW10_012020	320,264	3.16

Internal Standard Summary

QAP: LAB QAP
Spec No: 99479 Ver. 1

Test: 6850/ClO4 DOD

Instrument ID: E-LCMS-01
Date Acquired: 2/17/20 12:29

Analysis Lot: 670318

		Sodium Perchlorate-18O4	
		Area	**RT**
	ICAL Average ==>	230,109	3.04
	Upper Limit ==>	345,164	5.04
	Lower Limit ==>	115,055	1.04
Associated Analyses			
20200217_01 EQ2000058-02	Continuing Calibration Ve	282,852	3.16
20200217_01 E2000075-003	HBW1_012020	293,434	3.15

Internal Standard Summary

QAP: LAB QAP
Spec No: 99479 Ver. 1

Test: 6850/ClO4 DOD

Instrument ID: E-LCMS-01
Date Acquired: 2/17/20 13:48

Analysis Lot: 670318

		Sodium Perchlorate-18O4	
		Area	**RT**
	ICAL Average ==>	230,109	3.04
	Upper Limit ==>	345,164	5.04
	Lower Limit ==>	115,055	1.04
Associated Analyses			
20200217_02 EQ2000058-03	Continuing Calibration Ve	266,026	3.16
20200217_02 E2000075-004	GPW1_012020	280,167	3.16
20200217_02 E2000075-005	GPW1_012020_a	291,838	3.16
20200217_03 E2000075-006	GPW3_012020	311,790	3.16
20200217_03 E2000076-001	LH18/24-SP650_12820_E	322,092	3.14
20200217_03 E2000092-001	LH18/24-SP650_020420_	295,380	3.14
20200217_03 EQ2000051-03	Duplicate Lab Control San	287,501	3.11

Internal Standard Summary

QAP: LAB QAP
Spec No: 99479 Ver. 1

Test: 6850/ClO4 DOD

Instrument ID: E-LCMS-01
Date Acquired: 2/17/20 16:23

Analysis Lot: 670318

		Sodium Perchlorate-18O4	
		Area	**RT**
	ICAL Average ==>	230,109	3.04
	Upper Limit ==>	345,164	5.04
	Lower Limit ==>	115,055	1.04
Associated Analyses			
20200217_03 EQ2000058-04	Continuing Calibration Ve	293,622	3.16

Quantitation Report

Data File:	I:\LCMS01\DATA\20200217\20200217_007	**Instrument:**	E-LCMS-01
Acqu Date:	2/17/20 11:26	**Vial:**	8
Run Type:	CCV	**Dilution:**	1
Lab ID:	EQ2000058-01	**Raw Units:**	ng/mL

Bottle ID:		**Tier:**	IV	**Matrix:**	Water
Prod Code:	ClO4 DOD	**Collect Date:**	1/23/20	**Receive Date:**	1/27/20

Analysis Lot:	670318	**Prep Lot:**		**Report Group:**	EQ2000058
Analysis Method:	6850	**Prep Method:**			
		Prep Date:			

Title:	Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass	**Calibration ID:**	EC2000001
		Report List ID:	21851

Internal Standard Compounds

Parameter Name	RT	RT Dev	Response	Solution Conc	Area Criteria
Sodium Perchlorate-18O4	3.158		252380	1.00000	OK

Target Compounds

Parameter Name	RT	RT Dev	Response	Solution Conc	Rpt?
Perchlorate	3.160		361516	10.59482	Y

U: Undetected at or above MDL
J: Analyte detected above MDL, but below MRL
B: Hit above MRL also found in Method Blank
E: Analyte concentration above high point of ICAL
N: Presumptive evidence of compound

D: Result from dilution
m: Manual integration performed
d: Compound manually deleted
NR: Analyte not reported from this analysis

*: Result fails acceptance criteria
#: Acceptance criteria not applicable
?: Insufficient information to determine acceptance
e: Result >= MRL, but MRL less than low point of ICAL
c: check for co-elution

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Continuing Calibration Verification Summary

Calibration ID: EC2000001 **Spec Set:** #99479 v. 1

QAP Name: LAB QAP **List ID:** #21851

List Name: Perchlorate RJ DOD **Signal ID:** 1

Data File: I:\LCMS01\DATA\20200217\20200217_007

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Perchlorate	10.0	10.6	0.1352	0.1432	6		± 15%	Average RF

Quantitation Report

Data File:	I:\LCMS01\DATA\20200217\20200217_015	**Instrument:**	E-LCMS-01
Acqu Date:	2/17/20 12:29	**Vial:**	6
Run Type:	CCV	**Dilution:**	1
Lab ID:	EQ2000058-02	**Raw Units:**	ng/mL

Bottle ID:		**Tier:**	IV	**Matrix:**	Water
Prod Code:	ClO4 DOD	**Collect Date:**	1/23/20	**Receive Date:**	1/27/20

Analysis Lot:	670318	**Prep Lot:**		**Report Group:**	EQ2000058
Analysis Method:	6850	**Prep Method:**			
		Prep Date:			

Title:	Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass	**Calibration ID:**	EC2000001
		Report List ID:	21851

Internal Standard Compounds

Parameter Name	RT	RT Dev	Response	Solution Conc	Area Criteria
Sodium Perchlorate-18O4	3.159		282852	1.00000	OK

Target Compounds

Parameter Name	RT	RT Dev	Response	Solution Conc	Rpt?
Perchlorate	3.161		407931	10.66715	Y

U: Undetected at or above MDL
J: Analyte detected above MDL, but below MRL
B: Hit above MRL also found in Method Blank
E: Analyte concentration above high point of ICAL
N: Presumptive evidence of compound

D: Result from dilution
m: Manual integration performed
d: Compound manually deleted
NR: Analyte not reported from this analysis

*: Result fails acceptance criteria
#: Acceptance criteria not applicable
?: Insufficient information to determine acceptance
e: Result >= MRL, but MRL less than low point of ICAL
c: check for co-elution

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Continuing Calibration Verification Summary

Calibration ID: EC2000001
Spec Set: #99479 v. 1
QAP Name: LAB QAP
List ID: #21851
List Name: Perchlorate RJ DOD
Signal ID: 1
Data File: I:\LCMS01\DATA\20200217\20200217_015

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Perchlorate	10.0	10.7	0.1352	0.1442	7		± 15%	Average RF

Quantitation Report

Data File:	I:\LCMS01\DATA\20200217\20200217_025	**Instrument:**	E-LCMS-01
Acqu Date:	2/17/20 13:48	**Vial:**	4
Run Type:	CCV	**Dilution:**	1
Lab ID:	EQ2000058-03	**Raw Units:**	ng/mL

Bottle ID:		**Tier:**	IV	**Matrix:**	Water
Prod Code:	ClO4 DOD	**Collect Date:**	1/23/20	**Receive Date:**	1/27/20

Analysis Lot:	670318	**Prep Lot:**		**Report Group:**	EQ2000058
Analysis Method:	6850	**Prep Method:**			
		Prep Date:			

Title:	Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass	**Calibration ID:**	EC2000001
		Report List ID:	21851

Internal Standard Compounds

Parameter Name	RT	RT Dev	Response	Solution Conc	Area Criteria
Sodium Perchlorate-18O4	3.158		266026	1.00000	OK

Target Compounds

Parameter Name	RT	RT Dev	Response	Solution Conc	Rpt?
Perchlorate	3.159		391076	10.87321	Y

U: Undetected at or above MDL
J: Analyte detected above MDL, but below MRL
B: Hit above MRL also found in Method Blank
E: Analyte concentration above high point of ICAL
N: Presumptive evidence of compound

D: Result from dilution
m: Manual integration performed
d: Compound manually deleted
NR: Analyte not reported from this analysis

*: Result fails acceptance criteria
#: Acceptance criteria not applicable
?: Insufficient information to determine acceptance
e: Result >= MRL, but MRL less than low point of ICAL
c: check for co-elution

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Continuing Calibration Verification Summary

Calibration ID: EC2000001
Spec Set: #99479 v. 1
QAP Name: LAB QAP
List ID: #21851
List Name: Perchlorate RJ DOD
Signal ID: 1
Data File: I:\LCMS01\DATA\20200217\20200217_025

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Perchlorate	10.0	10.9	0.1352	0.1470	9		± 15%	Average RF

Quantitation Report

Data File:	I:\LCMS01\DATA\20200217\20200217_036	**Instrument:**	E-LCMS-01
Acqu Date:	2/17/20 16:23	**Vial:**	2
Run Type:	CCV	**Dilution:**	1
Lab ID:	EQ2000058-04	**Raw Units:**	ng/mL

Bottle ID:		**Tier:**	IV	**Matrix:**	Water
Prod Code:	ClO4 DOD	**Collect Date:**	1/23/20	**Receive Date:**	1/27/20

Analysis Lot:	670318	**Prep Lot:**		**Report Group:**	EQ2000058
Analysis Method:	6850	**Prep Method:**			
		Prep Date:			

Title:	Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass	**Calibration ID:**	EC2000001
		Report List ID:	21851

Internal Standard Compounds

Parameter Name	RT	RT Dev	Response	Solution Conc	Area Criteria
Sodium Perchlorate-18O4	3.158		293622	1.00000	OK

Target Compounds

Parameter Name	RT	RT Dev	Response	Solution Conc	Rpt?
Perchlorate	3.159		417294	10.51172	Y

U: Undetected at or above MDL
J: Analyte detected above MDL, but below MRL
B: Hit above MRL also found in Method Blank
E: Analyte concentration above high point of ICAL
N: Presumptive evidence of compound

D: Result from dilution
m: Manual integration performed
d: Compound manually deleted
NR: Analyte not reported from this analysis

*: Result fails acceptance criteria
#: Acceptance criteria not applicable
?: Insufficient information to determine acceptance
e: Result >= MRL, but MRL less than low point of ICAL
c: check for co-elution

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Continuing Calibration Verification Summary

Calibration ID: EC2000001
Spec Set: #99479 v. 1
QAP Name: LAB QAP
List ID: #21851
List Name: Perchlorate RJ DOD
Signal ID: 1
Data File: I:\LCMS01\DATA\20200217\20200217_036

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Perchlorate	10.0	10.5	0.1352	0.1421	5		± 15%	Average RF

Quantitation Report

Data File:	I:\LCMS01\DATA\20200217\20200217_009	**Instrument:**	E-LCMS-01
Acqu Date:	2/17/20 11:42	**Vial:**	21
Run Type:	MB	**Dilution:**	1
Lab ID:	EQ2000051-01	**Raw Units:**	ng/mL

Bottle ID:		**Tier:**	II	**Matrix:**	Water
Prod Code:	ClO4 DOD	**Collect Date:**	1/23/20	**Receive Date:**	1/27/20

Analysis Lot:	670318	**Prep Lot:**	353630	**Report Group:**	EQ2000051
Analysis Method:	6850	**Prep Method:**	Method		
		Prep Date:	2/11/20		

Title:	Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass	**Calibration ID:**	EC2000001
		Report List ID:	21851

Internal Standard Compounds

Parameter Name	RT	RT Dev	Response	Solution Conc	Area Criteria
Sodium Perchlorate-18O4	3.158		158257	1.00000	OK

Target Compounds

Final Conc.Units: ug/L

Parameter Name	RT	RT Dev	Response	Solution Conc	Final Conc	Q	Rpt?
Perchlorate	0		0	0	0	U	Y

Prep Amount:	10 mL	**Dilution:**	1
Prep Final Amount:	10.00 mL	**Basis Factor:**	100.00

U: Undetected at or above MDL
J: Analyte detected above MDL, but below MRL
B: Hit above MRL also found in Method Blank
E: Analyte concentration above high point of ICAL
N: Presumptive evidence of compound

D: Result from dilution
m: Manual integration performed
d: Compound manually deleted
NR: Analyte not reported from this analysis

*: Result fails acceptance criteria
#: Acceptance criteria not applicable
?: Insufficient information to determine acceptance
e: Result >= MRL, but MRL less than low point of ICAL
c: check for co-elution

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Quantitation Report

Data File:	I:\LCMS01\DATA\20200217\20200217_010	**Instrument:**	E-LCMS-01
Acqu Date:	2/17/20 11:50	**Vial:**	24
Run Type:	LCS	**Dilution:**	1
Lab ID:	EQ2000051-02	**Raw Units:**	ng/mL

Bottle ID:		**Tier:**	II	**Matrix:**	Water
Prod Code:	ClO4 DOD	**Collect Date:**	1/23/20	**Receive Date:**	1/27/20

Analysis Lot:	670318	**Prep Lot:**	353630	**Report Group:**	EQ2000051
Analysis Method:	6850	**Prep Method:**	Method		
		Prep Date:	2/11/20		

Title:	Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass	**Calibration ID:**	EC2000001
		Report List ID:	21851

Internal Standard Compounds

Parameter Name	RT	RT Dev	Response	Solution Conc	Area Criteria
Sodium Perchlorate-18O4	3.159	+0.00	255372	1.00000	OK

Target Compounds

Final Conc.Units: ug/L

Parameter Name	RT	RT Dev	Response	Solution Conc	Final Conc	Q	Rpt?
Perchlorate	3.160		29539	0.85554	0.856		Y

Prep Amount:	10 mL	**Dilution:**	1
Prep Final Amount:	10.00 mL	**Basis Factor:**	100.00

U: Undetected at or above MDL
J: Analyte detected above MDL, but below MRL
B: Hit above MRL also found in Method Blank
E: Analyte concentration above high point of ICAL
N: Presumptive evidence of compound

D: Result from dilution
m: Manual integration performed
d: Compound manually deleted
NR: Analyte not reported from this analysis

*: Result fails acceptance criteria
#: Acceptance criteria not applicable
?: Insufficient information to determine acceptance
e: Result >= MRL, but MRL less than low point of ICAL
c: check for co-elution

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Quantitation Report

Data File:	I:\LCMS01\DATA\20200217\20200217_035	**Instrument:**	E-LCMS-01
Acqu Date:	2/17/20 16:15	**Vial:**	26
Run Type:	DLCS	**Dilution:**	1
Lab ID:	EQ2000051-03	**Raw Units:**	ng/mL

Bottle ID:		**Tier:**	II	**Matrix:**	Water
Prod Code:	ClO4 DOD	**Collect Date:**	1/23/20	**Receive Date:**	1/27/20

Analysis Lot:	670318	**Prep Lot:**	353630	**Report Group:**	EQ2000051
Analysis Method:	6850	**Prep Method:**	Method		
		Prep Date:	2/11/20		

Title:	Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass	**Calibration ID:**	EC2000001
		Report List ID:	21851

Internal Standard Compounds

Parameter Name	RT	RT Dev	Response	Solution Conc	Area Criteria
Sodium Perchlorate-18O4	3.105	-0.05	287501	1.00000	OK

Target Compounds

Final Conc.Units: ug/L

Parameter Name	RT	RT Dev	Response	Solution Conc	Final Conc	Q	Rpt?
Perchlorate	3.106	-0.05	32714	0.84160	0.842		Y

Prep Amount:	10 mL	**Dilution:**	1
Prep Final Amount:	10.00 mL	**Basis Factor:**	100.00

U: Undetected at or above MDL
J: Analyte detected above MDL, but below MRL
B: Hit above MRL also found in Method Blank
E: Analyte concentration above high point of ICAL
N: Presumptive evidence of compound

D: Result from dilution
m: Manual integration performed
d: Compound manually deleted
NR: Analyte not reported from this analysis

*: Result fails acceptance criteria
#: Acceptance criteria not applicable
?: Insufficient information to determine acceptance
e: Result >= MRL, but MRL less than low point of ICAL
c: check for co-elution

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Quantitation Report

Data File:	I:\LCMS01\DATA\20200217\20200217_034	**Instrument:**	E-LCMS-01
Acqu Date:	2/17/20 15:18	**Vial:**	20
Run Type:	N/A	**Dilution:**	1
Lab ID:	E2000092-001	**Raw Units:**	ng/mL

Bottle ID:	E2000092-001.01	**Tier:**	II	**Matrix:**	Water
Prod Code:	ClO4 DOD	**Collect Date:**	2/4/20	**Receive Date:**	2/5/20

Analysis Lot:	670318	**Prep Lot:**	353630	**Report Group:**	E2000092
Analysis Method:	6850	**Prep Method:**	Method		
		Prep Date:	2/11/20		

Title:	Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass	**Calibration ID:**	EC2000001
		Report List ID:	21851

Internal Standard Compounds

Parameter Name	RT	RT Dev	Response	Solution Conc	Area Criteria
Sodium Perchlorate-18O4	3.141	-0.02	295380	1.00000	OK

Target Compounds

Final Conc.Units: ug/L

Parameter Name	RT	RT Dev	Response	Solution Conc	Final Conc	Q	Rpt?
Perchlorate	3.144	-0.01	5592	0.14003	0.140		Y

Prep Amount:	10 mL	**Dilution:**	1
Prep Final Amount:	10.00 mL	**Basis Factor:**	100.00

U: Undetected at or above MDL
J: Analyte detected above MDL, but below MRL
B: Hit above MRL also found in Method Blank
E: Analyte concentration above high point of ICAL
N: Presumptive evidence of compound

D: Result from dilution
m: Manual integration performed
d: Compound manually deleted
NR: Analyte not reported from this analysis

*: Result fails acceptance criteria
#: Acceptance criteria not applicable
?: Insufficient information to determine acceptance
e: Result >= MRL, but MRL less than low point of ICAL
c: check for co-elution

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ALS Group Houston

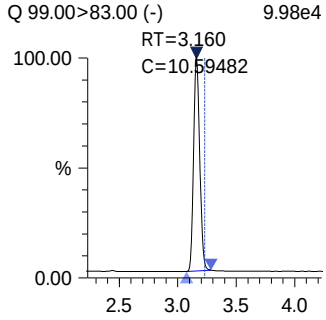
20200217_007

Sample ID: PERCHLORATE7
Date acquired: 2/17/2020 11:26:26 AM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200217\20200217_007.lcd
Vial: 3 | Inj. Volume: 25.0000uL | Tray: 1

Name	Data Filename	Sample ID	Found RT	Area	Conc.	Acquired Date	Cal Point	Dil. Factor	Inj Vol	ISTD Area	Tray	Vial
Perchlorate	20200217_007	PERCHLORATE7	3.160	361516	10.59482	2/17/2020 11:26:26 AM	No	1.00000	25.0000	252380	1	3
Sodium Perchlorate-18O4_IS	20200217_007	PERCHLORATE7	3.158	252380	1.00000	2/17/2020 11:26:26 AM	No	1.00000	25.0000	252380	1	3

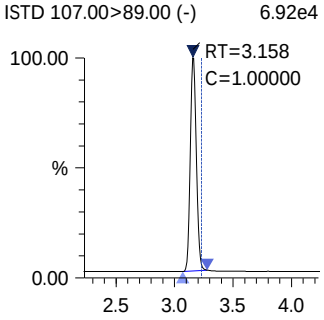
Perchlorate

Conc 10.59482
Area 361516



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 252380



ALS Group Houston

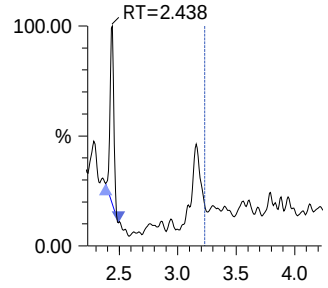
20200217_009

Sample ID: EQ2000051-01
Date acquired: 2/17/2020 11:42:11 AM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200217\20200217_009.lcd
Vial: 5 | Inj. Volume: 25.0000uL | Tray: 1

Name	Data Filename	Sample ID	Found RT	Area	Conc.	Acquired Date	Cal Point	Dil. Factor	Inj Vol	ISTD Area	Tray	Vial
Perchlorate	20200217_009	EQ2000051-01	----	----	----	2/17/2020 11:42:11 AM	No	1.00000	25.0000	158257	1	5
Sodium Perchlorate-18O4_IS	20200217_009	EQ2000051-01	3.158	158257	1.00000	2/17/2020 11:42:11 AM	No	1.00000	25.0000	158257	1	5

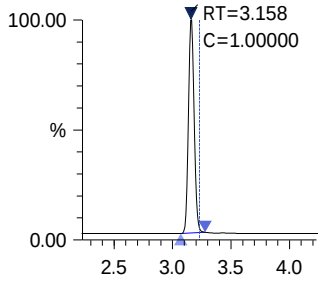
Perchlorate

Conc ----
Area ----
Q 99.00>83.00 (-) 3.96e2



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 158257
ISTD 107.00>89.00 (-) 4.61e4



ALS Group Houston

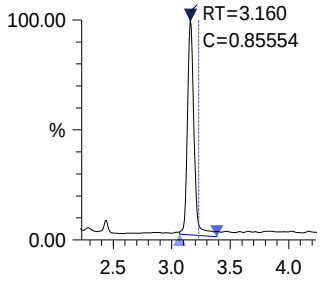
20200217_010

Sample ID: EQ2000051-02
Date acquired: 2/17/2020 11:50:05 AM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200217\20200217_010.lcd
Vial: 6 | Inj. Volume: 25.0000uL | Tray: 1

Name	Data Filename	Sample ID	Found RT	Area	Conc.	Acquired Date	Cal Point	Dil. Factor	Inj Vol	ISTD Area	Tray	Vial
Perchlorate	20200217_010	EQ2000051-02	3.160	29539	0.85554	2/17/2020 11:50:05 AM	No	1.00000	25.0000	255372	1	6
Sodium Perchlorate-18O4_IS	20200217_010	EQ2000051-02	3.159	255372	1.00000	2/17/2020 11:50:05 AM	No	1.00000	25.0000	255372	1	6

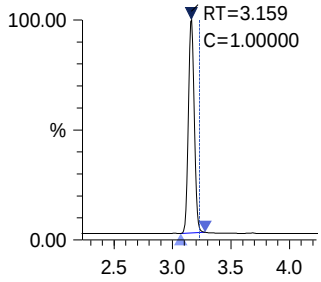
Perchlorate

Conc 0.85554
Area 29539
Q 99.00>83.00 (-) 7.48e3



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 255372
ISTD 107.00>89.00 (-) 7.19e4



ALS Group Houston

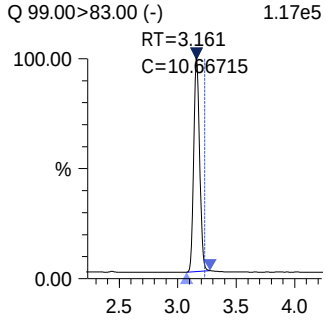
PERCHLORATE7

Date acquired: 2/17/2020 12:29:39 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200217\20200217_015.lcd
Vial: 3 | Inj. Volume: 25.0000uL | Tray: 1

Name	Data Filename	Sample ID	Found RT	Area	Conc.	Acquired Date	Cal Point	Dil. Factor	Inj Vol	ISTD Area	Tray	Vial
Perchlorate	20200217_015	PERCHLORATE7	3.161	407931	10.66715	2/17/2020 12:29:39 PM	No	1.00000	25.0000	282852	1	3
Sodium Perchlorate-18O4_IS	20200217_015	PERCHLORATE7	3.159	282852	1.00000	2/17/2020 12:29:39 PM	No	1.00000	25.0000	282852	1	3

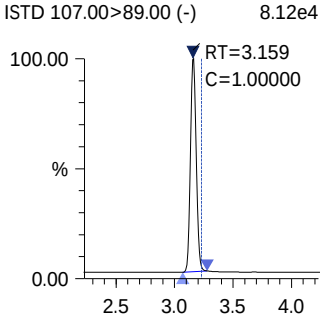
Perchlorate

Conc 10.66715
Area 407931



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 282852



ALS Group Houston

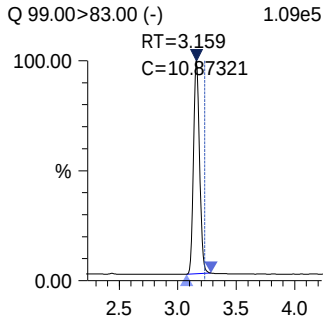
PERCHLORATE7

Date acquired: 2/17/2020 1:48:35 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200217\20200217_025.lcd
Vial: 3 | Inj. Volume: 25.0000uL | Tray: 1

Name	Data Filename	Sample ID	Found RT	Area	Conc.	Acquired Date	Cal Point	Dil. Factor	Inj Vol	ISTD Area	Tray	Vial
Perchlorate	20200217_025	PERCHLORATE7	3.159	391076	10.87321	2/17/2020 1:48:35 PM	No	1.00000	25.0000	266026	1	3
Sodium Perchlorate-18O4_IS	20200217_025	PERCHLORATE7	3.158	266026	1.00000	2/17/2020 1:48:35 PM	No	1.00000	25.0000	266026	1	3

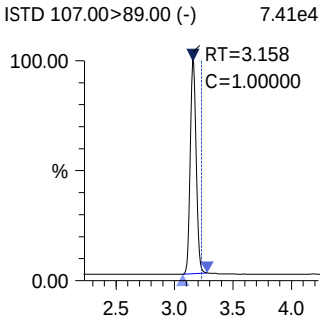
Perchlorate

Conc 10.87321
Area 391076



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 266026



ALS Group Houston

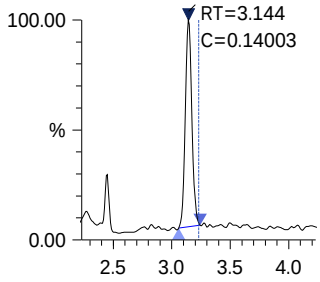
20200217_034

Sample ID: E2000092-001
Date acquired: 2/17/2020 3:18:18 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200217\20200217_034.lcd
Vial: 28 | Inj. Volume: 25.0000uL | Tray: 1

Name	Data Filename	Sample ID	Found RT	Area	Conc.	Acquired Date	Cal Point	Dil. Factor	Inj Vol	ISTD Area	Tray	Vial
Perchlorate	20200217_034	E2000092-001	3.144	5592	0.14003	2/17/2020 3:18:18 PM	No	1.00000	25.0000	295380	1	28
Sodium Perchlorate-18O4_IS	20200217_034	E2000092-001	3.141	295380	1.00000	2/17/2020 3:18:18 PM	No	1.00000	25.0000	295380	1	28

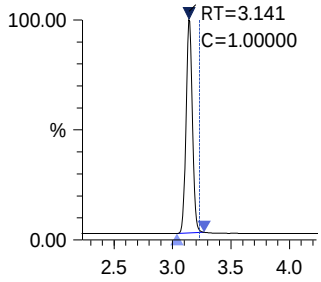
Perchlorate

Conc 0.14003
Area 5592
Q 99.00>83.00 (-) 1.47e3



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 295380
ISTD 107.00>89.00 (-) 7.86e4



ALS Group Houston

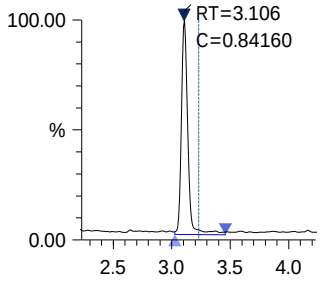
20200217_035

Sample ID: EQ2000051-03
Date acquired: 2/17/2020 4:15:43 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200217\20200217_035.lcd
Vial: 29 | Inj. Volume: 25.0000uL | Tray: 1

Name	Data Filename	Sample ID	Found RT	Area	Conc.	Acquired Date	Cal Point	Dil. Factor	Inj Vol	ISTD Area	Tray	Vial
Perchlorate	20200217_035	EQ2000051-03	3.106	32714	0.84160	2/17/2020 4:15:43 PM	No	1.00000	25.0000	287501	1	29
Sodium Perchlorate-18O4_IS	20200217_035	EQ2000051-03	3.105	287501	1.00000	2/17/2020 4:15:43 PM	No	1.00000	25.0000	287501	1	29

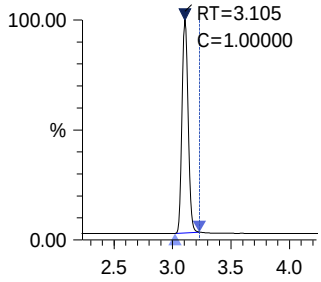
Perchlorate

Conc 0.84160
Area 32714
Q 99.00>83.00 (-) 8.39e3



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 287501
ISTD 107.00>89.00 (-) 8.11e4



ALS Group Houston

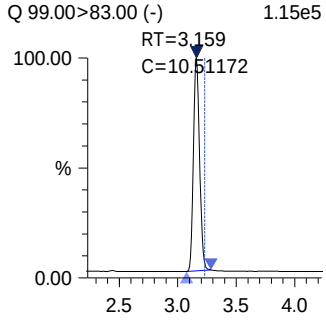
20200217_036

Sample ID: PERCHLORATE7
Date acquired: 2/17/2020 4:23:39 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200217\20200217_036.lcd
Vial: 3 | Inj. Volume: 25.0000uL | Tray: 1

Name	Data Filename	Sample ID	Found RT	Area	Conc.	Acquired Date	Cal Point	Dil. Factor	Inj Vol	ISTD Area	Tray	Vial
Perchlorate	20200217_036	PERCHLORATE7	3.159	417294	10.51172	2/17/2020 4:23:39 PM	No	1.00000	25.0000	293622	1	3
Sodium Perchlorate-18O4_IS	20200217_036	PERCHLORATE7	3.158	293622	1.00000	2/17/2020 4:23:39 PM	No	1.00000	25.0000	293622	1	3

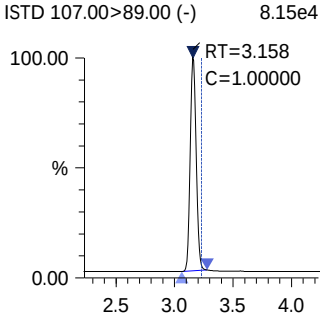
Perchlorate

Conc 10.51172
Area 417294



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 293622



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February 14, 2020

Analytical Report for Service Request No: K2001132

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

RE: HS20020147

Dear RJ,

Enclosed are the results of the sample(s) submitted to our laboratory February 06, 2020
For your reference, these analyses have been assigned our service request number **K2001132.**

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. All results are intended to be considered in their entirety, and ALS Group USA Corp. dba ALS Environmental (ALS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please contact me if you have any questions. My extension is 3350. You may also contact me via email at Kelley.Lovejoy@alsglobal.com.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Kelley Lovejoy

Kelley Lovejoy
Project Manager

RIGHT SOLUTIONS | RIGHT PARTNER

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Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LOD	Limit of Detection
LOQ	Limit of Quantitation
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

Inorganic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
E	The result is an estimate amount because the value exceeded the instrument calibration range.
J	The result is an estimated value.
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
i	The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
X	See case narrative.
Q	See case narrative. One or more quality control criteria was outside the limits.
H	The holding time for this test is immediately following sample collection. The samples were analyzed as soon as possible after receipt by the laboratory.

Metals Data Qualifiers

#	The control limit criteria is not applicable. See case narrative.
J	The result is an estimated value.
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
M	The duplicate injection precision was not met.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.
S	The reported value was determined by the Method of Standard Additions (MSA).
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
i	The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
X	See case narrative.
+	The correlation coefficient for the MSA is less than 0.995.
Q	See case narrative. One or more quality control criteria was outside the limits.

Organic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
A	A tentatively identified compound, a suspected aldol-condensation product.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
C	The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
D	The reported result is from a dilution.
E	The result is an estimated value.
J	The result is an estimated value.
N	The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
P	The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results.
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
i	The MRL/MDL or LOQ/LOD is elevated due to a chromatographic interference.
X	See case narrative.
Q	See case narrative. One or more quality control criteria was outside the limits.

Additional Petroleum Hydrocarbon Specific Qualifiers

F	The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
L	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
H	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
O	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
Y	The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
Z	The chromatographic fingerprint does not resemble a petroleum product.

ALS Group USA Corp. dba ALS Environmental (ALS) - Kelso
State Certifications, Accreditations, and Licenses

Agency	Web Site	Number
Alaska DEH	http://dec.alaska.gov/eh/lab/cs/csapproval.htm	UST-040
Arizona DHS	http://www.azdhs.gov/lab/license/env.htm	AZ0339
Arkansas - DEQ	http://www.adeq.state.ar.us/techsvs/labcert.htm	88-0637
California DHS (ELAP)	http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx	2795
DOD ELAP	http://www.denix.osd.mil/edqw/Accreditation/AccreditedLabs.cfm	L16-58-R4
Florida DOH	http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm	E87412
Hawaii DOH	http://health.hawaii.gov/	-
ISO 17025	http://www.pjlabs.com/	L16-57
Louisiana DEQ	http://www.deq.louisiana.gov/page/la-lab-accreditation	03016
Maine DHS	http://www.maine.gov/dhhs/	WA01276
Minnesota DOH	http://www.health.state.mn.us/accreditation	053-999-457
Nevada DEP	http://ndep.nv.gov/bsdw/labservice.htm	WA01276
New Jersey DEP	http://www.nj.gov/dep/enforcement/oqa.html	WA005
New York - DOH	https://www.wadsworth.org/regulatory/elap	12060
North Carolina DEQ	https://deq.nc.gov/about/divisions/water-resources/water-resources-data/water-sciences-home-page/laboratory-certification-branch/non-field-lab-certification	605
Oklahoma DEQ	http://www.deq.state.ok.us/CSDnew/labcert.htm	9801
Oregon – DEQ (NELAP)	http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	WA100010
South Carolina DHEC	http://www.scdhec.gov/environment/EnvironmentalLabCertification/	61002
Texas CEQ	http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html	T104704427
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C544
Wyoming (EPA Region 8)	https://www.epa.gov/region8-waterops/epa-region-8-certified-drinking-water-	-
Kelso Laboratory Website	www.alsglobal.com	NA

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. A complete listing of specific NELAP-certified analytes, can be found in the certification section at www.ALSGlobal.com or at the accreditation bodies web site.
Please refer to the certification and/or accreditation body's web site if samples are submitted for compliance purposes. The states highlighted above, require the analysis be listed on the state certification if used for compliance purposes and if the method/anlayte is offered by that state.

Case Narrative

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ALS Environmental

Client: ALS Environmental - US
Project: HS20020147
Sample Matrix: Water

Service Request: K2001132
Date Received: 02/06/2020

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:

One water sample was received for analysis at ALS Environmental on 02/06/2020. Any discrepancies upon initial sample inspection are annotated on the sample receipt and preservation form included within this report. The sample was stored at minimum in accordance with the analytical method requirements.

General Chemistry:

No significant anomalies were noted with this analysis.

Approved by Kelley Lovejoy Date 02/14/2020

Chain of Custody

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K2001132

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID:** **13281**

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:
Email:

INVOICE INFORMATION:

Company: ALS Houston
Contact: Accounts Payable
Address: 10450 Stancliff Rd, Ste 210
Phone: +1 281 530 5656
Reference: HS20020147
TSR: Danielle Winnings

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS20020147-01**	**LH18/24-SP650_020420**	**Water**	**04 Feb 2020 14:00**
	TOC Analysis for DOD Level IV			13 Feb 2020

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. MAKAN Date/Time: 02/05/20 18:00

Received By: [signature] Date/Time: 2/6/2020 1000

Cooler ID(s): Temperature(s):

00969289

PC KL

Cooler Receipt and Preservation Form

Client ALS Houston Service Request K20 01137

Received: 2/6/20 Opened: 2/6/20 By: CG Unloaded: 2/6/20 By: CG

1. Samples were received via? *USPS* (*Fed Ex*) *UPS* *DHL* *PDX* *Courier* *Hand Delivered*
2. Samples were received in: (circle) (*Cooler*) *Box* *Envelope* *Other* _____ *NA*
3. Were custody seals on coolers? NA (Y) N If yes, how many and where? 2 Front
   If present, were custody seals intact? (Y) N If present, were they signed and dated? (Y) N

Raw Cooler Temp	Corrected Cooler Temp	Raw Temp Blank	Corrected Temp Blank	Corr. Factor	Thermometer ID	Cooler/COC ID NA	Tracking Number NA	File
-0.8	-0.7	1.0	1.1	+0.1	384	13287	1251 0294 3547	

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

Sample ID on Bottle	Sample ID on COC	Identified by:

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

Notes, Discrepancies, & Resolutions: _____

RUSH

General Chemistry

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www.alsglobal.com

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	K2001132
Project:	HS20020147	**Date Collected:**	02/4/20
Sample Matrix:	Water	**Date Received:**	02/6/20
Analysis Method:	SM 5310 C	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA

Carbon, Total Organic

Sample Name	Lab Code	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
LH18/24-SP650_020420	K2001132-001	**2.44**	0.50	0.20	0.07	1	02/12/20 02:08	
Method Blank	K2001132-MB	ND U	0.50	0.20	0.07	1	02/11/20 22:05	

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	K2001132
Project	HS20020147	**Date Collected:**	02/04/20
Sample Matrix:	Water	**Date Received:**	02/06/20
		Date Analyzed:	02/12/20

Replicate Sample Summary
General Chemistry Parameters

Sample Name:	LH18/24-SP650_020420	**Units:**	mg/L
Lab Code:	K2001132-001	**Basis:**	NA

Analyte Name	Analysis Method	LOQ	LOD	MDL	Sample Result	Duplicate Sample K2001132-001DUP Result	Average	RPD	RPD Limit
Carbon, Total Organic	SM 5310 C	0.50	0.20	0.07	2.44	2.36	2.40	3	10

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

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

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

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	K2001132
Project:	HS20020147	**Date Analyzed:**	02/11/20
Sample Matrix:	Water	**Date Extracted:**	NA

Lab Control Sample Summary
Carbon, Total Organic

Analysis Method:	SM 5310 C	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA
		Analysis Lot:	669413

Sample Name	Lab Code	Result	Spike Amount	% Rec	% Rec Limits
Lab Control Sample	K2001132-LCS	25.4	25.0	101	83-117

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US **Service Request:** K2001132
Project: HS20020147

Continuing Calibration Verification (CCV) Summary

Carbon, Total Organic

Analysis Method: SM 5310 C **Units:** mg/L

	Analysis Lot	Lab Code	Date Analyzed	True Value	Measured Value	Percent Recovery	Acceptance Limits
CCV1	669413	KQ2001885-01	02/11/20 21:35	25.0	23.6	94	90-110
CCV2	669413	KQ2001885-02	02/12/20 01:38	25.0	23.8	95	90-110
CCV3	669413	KQ2001885-03	02/12/20 05:24	25.0	23.4	93	90-110

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US **Service Request:**K2001132
Project: HS20020147

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	669413	KQ2001885-04	02/11/20 21:50	0.50	0.20	0.07	ND	U
CCB2	669413	KQ2001885-05	02/12/20 01:53	0.50	0.20	0.07	0.15	J
CCB3	669413	KQ2001885-06	02/12/20 05:39	0.50	0.20	0.07	ND	U

Raw Data

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

General Chemistry

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
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Work Request # Original ( ) K7001131, 1132, 1142, 1173, 1207

Tier: IV IV II IV II

Date Analyzed: 2/11/20

Analyst: BCP

Run # 669413

Analysis: TOC

DATA QUALITY REPORT
INORGANICS

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

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

COMMENTS:

Final Approved by: [signature] Date: 02/13/20

DQREPORT

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 669413 **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
K2001131-001	Carbon, Total Organic	N/A		Ground Water	3.97 mg/L	10 ml	3.97 mg/L	1	0.07	0.50			2/11/20 22:49	N	IV
K2001131-002	Carbon, Total Organic	N/A		Ground Water	4.82 mg/L	10 ml	4.82 mg/L	1	0.07	0.50			2/11/20 23:46	N	IV
K2001131-003	Carbon, Total Organic	N/A		Ground Water	7.55 mg/L	10 ml	75.5 mg/L	10	0.7	5.0			2/12/20 00:14	N	IV
K2001131-004	Carbon, Total Organic	N/A		Ground Water	4.39 mg/L	10 ml	880 mg/L	200	20	100			2/12/20 00:42	N	IV
K2001131-005	Carbon, Total Organic	N/A		Ground Water	4.54 mg/L	10 ml	910 mg/L	200	20	100			2/12/20 01:10	N	IV
K2001132-001	Carbon, Total Organic	N/A		Water	2.44 mg/L	10 ml	2.44 mg/L	1	0.07	0.50			2/12/20 02:08	N	IV
K2001142-001	Carbon, Total Organic	N/A		Water	2.28 mg/L	10 ml	46 mg/L	20	2	10			2/12/20 03:04	N	II
K2001142-002	Carbon, Total Organic	N/A		Water	3.92 mg/L	10 ml	78 mg/L	20	2	10			2/12/20 03:32	N	II
K2001142-004	Carbon, Total Organic	N/A		Water	15.91 mg/L	10 ml	15.9 mg/L	1	0.07	0.50			2/12/20 04:00	N	II
K2001173-001	Carbon, Total Organic	N/A		Water	0.64 mg/L	10 ml	0.64 mg/L	1	0.07	0.50			2/12/20 04:28	N	IV
K2001173-002	Carbon, Total Organic	N/A		Water	0.62 mg/L	10 ml	0.62 mg/L	1	0.07	0.50			2/12/20 04:56	N	IV
K2001207-001	Carbon, Total Organic	N/A		Water	0.16 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			2/12/20 02:36	N	II
KQ2001885-01	Carbon, Total Organic	CCV		Ground Water	23.59 mg/L	10 ml	23.6 mg/L	1					2/11/20 21:35	N	IV
KQ2001885-02	Carbon, Total Organic	CCV		Ground Water	23.81 mg/L	10 ml	23.8 mg/L	1					2/12/20 01:38	N	IV
KQ2001885-03	Carbon, Total Organic	CCV		Ground Water	23.37 mg/L	10 ml	23.4 mg/L	1					2/12/20 05:24	N	IV
KQ2001885-04	Carbon, Total Organic	CCB		Ground Water	0.01 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			2/11/20 21:50	N	IV
KQ2001885-05	Carbon, Total Organic	CCB		Ground Water	0.15 mg/L	10 ml	0.15 mg/L J	1	0.07	0.50			2/12/20 01:53	N	IV
KQ2001885-06	Carbon, Total Organic	CCB		Ground Water	-0.12 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			2/12/20 05:39	N	IV
KQ2001885-07	Carbon, Total Organic	MB		Ground Water	-0.01 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			2/11/20 22:05	N	IV
KQ2001885-08	Carbon, Total Organic	LCS		Ground Water	25.37 mg/L	10 ml	25.4 mg/L	1	0.07	0.50	101		2/11/20 22:19	N	IV
KQ2001885-09	Carbon, Total Organic	MS	K2001131-001	Ground Water	33.01 mg/L	10 ml	33.0 mg/L	1	0.07	0.50	116		2/11/20 23:17	N	IV
KQ2001885-10	Carbon, Total Organic	DUP	K2001131-002	Ground Water	5.14 mg/L	10 ml	5.14 mg/L	1	0.07	0.50		6	2/11/20 23:46	N	IV
KQ2001885-11	Carbon, Total Organic	DUP	K2001131-001	Ground Water	3.97 mg/L	10 ml	3.97 mg/L	1	0.07	0.50		<1	2/11/20 22:49	N	IV
KQ2001885-12	Carbon, Total Organic	DUP	K2001131-003	Ground Water	7.32 mg/L	10 ml	73.2 mg/L	10	0.7	5.0		3	2/12/20 00:14	N	IV
KQ2001885-13	Carbon, Total Organic	DUP	K2001131-004	Ground Water	4.39 mg/L	10 ml	880 mg/L	200	20	100		<1	2/12/20 00:42	N	IV
KQ2001885-14	Carbon, Total Organic	DUP	K2001131-005	Ground Water	4.53 mg/L	10 ml	910 mg/L	200	20	100		<1	2/12/20 01:10	N	IV

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

02/13/20

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 669413 **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
KQ2001885-15	Carbon, Total Organic	DUP	K2001132-001	Water	2.36 mg/L	10 ml	2.36 mg/L	1	0.07	0.50		3	2/12/20 02:08	N	IV
KQ2001885-16	Carbon, Total Organic	DUP	K2001142-001	Water	2.23 mg/L	10 ml	45 mg/L	20	2	10		2	2/12/20 03:04	N	II
KQ2001885-17	Carbon, Total Organic	DUP	K2001142-002	Water	3.96 mg/L	10 ml	79 mg/L	20	2	10		1	2/12/20 03:32	N	II
KQ2001885-18	Carbon, Total Organic	DUP	K2001142-004	Water	15.97 mg/L	10 ml	16.0 mg/L	1	0.07	0.50		<1	2/12/20 04:00	N	II
KQ2001885-19	Carbon, Total Organic	DUP	K2001173-001	Water	0.58 mg/L	10 ml	0.58 mg/L	1	0.07	0.50		10	2/12/20 04:28	N	IV
KQ2001885-20	Carbon, Total Organic	DUP	K2001173-002	Water	0.57 mg/L	10 ml	0.57 mg/L	1	0.07	0.50		9	2/12/20 04:56	N	IV
KQ2001885-21	Carbon, Total Organic	DUP	K2001207-001	Water	0.08 mg/L	10 ml	0.08 mg/L J	1	0.07	0.50		NC	2/12/20 02:36	N	II

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

ALS ENVIRONMENTAL

Matrix: WATER

Analysis: Total Organic Carbon (WATER) Method:Oxidation EPA 415.1/9060/5310C

Printout	Sample #	Dil. Factor	Solution Conc.,mg/L	Blank Correction, mg/L	Net mg/L	TOC mg/L	Reported TOC mg/L	
CBA	RB	1			0.0000	0	<0.5	
2	ccv	1	23.816	0.2297	23.5863	23.58625	23.6	2/11/2020
3	ccb	1	0.240	0.2297	0.0102	0.01015	<0.5	2/11/2020
4	mb	1	0.220	0.2297	-0.0102	-0.01015	<0.5	2/11/2020
5	lcs	1	25.595	0.2297	25.3650	25.36495	25.4	2/11/2020
6	K2001131-001	1	4.200	0.2297	3.9708	3.97075	3.97	2/11/2020
7	K2001131-001	1	4.196	0.2297	3.9665	3.96645	4.0	2/11/2020
8	KQ2001885-09	1	33.243	0.2297	33.0136	33.01355	33	2/11/2020
9	K2001131-002	1	5.050	0.2297	4.8205	4.82045	4.82	2/11/2020
10	K2001131-002	1	5.370	0.2297	5.1407	5.14065	5.14	2/11/2020
11	K2001131-003	10	7.778	0.2297	7.5484	75.4835	75.5	2/12/2020
12	K2001131-003	10	7.548	0.2297	7.3188	73.1875	73.19	2/12/2020
13	K2001131-004	200	4.620	0.2297	4.3900	877.99	877.99	2/12/2020
14	K2001131-004	200	4.622	0.2297	4.3919	878.37	878.37	2/12/2020
15	K2001131-005	200	4.766	0.2297	4.5368	907.35	907.4	2/12/2020
16	K2001131-005	200	4.764	0.2297	4.5348	906.95	907.0	2/12/2020
17	ccv	1	24.035	0.2297	23.8051	23.80505	23.81	2/12/2020
18	ccb	1	0.376	0.2297	0.1463	0.14625	<0.5	2/12/2020
19	K2001132-001	1	2.672	0.2297	2.4422	2.44215	2.4	2/12/2020
20	K2001132-001	1	2.591	0.2297	2.3610	2.36095	2.36	2/12/2020
21	K2001207-001	1	0.392	0.2297	0.1625	0.16245	<0.5	2/12/2020
22	K2001207-001	1	0.313	0.2297	0.0837	0.08365	<0.5	2/12/2020
23	K2001142-001	20	2.514	0.2297	2.2839	45.677	45.7	2/12/2020
24	K2001142-001	20	2.463	0.2297	2.2336	44.671	44.67	2/12/2020
25	K2001142-002	20	4.146	0.2297	3.9168	78.335	78.34	2/12/2020

ICAL Date 10/20/16 ICAL ID#:11-GEN-05-51A

LCS =24.0 ppm APG 4013 Lot #010615 (REF# 11-GEN-05-50N)

CCV = 25.0 ppm (Ref.#11-GEN-05-52E)

Spike: 0.05 ml of 5000 ppm stock ----> 10.0 ml =25.0 ppm x Dilution Factor (Ref.# 11-GEN-05-51M)

date time

Analyzed By: BW	Date Analyzed 2/11/2020
Reviewed By:	Date Reviewed 02/13/20

Revision 1, 2010 R:\WET\ANALYSES\TOC\TEMPLATE\TOCwaterLIMS

ALS ENVIRONMENTAL

Matrix: WATER

Analysis: Total Organic Carbon (WATER) Method:Oxidation EPA 415.1/9060/5310C

Printout	Sample #	Dil. Factor	Solution Conc.,mg/L	Blank Correction, mg/L	Net mg/L	TOC mg/L	Reported TOC mg/L	
26	K2001142-002	20	4.190	0.2297	3.9605	79.209	79.21	2/12/2020
27	K2001142-004	1	16.143	0.2297	15.9138	15.91375	15.91	2/12/2020
28	K2001142-004	1	16.200	0.2297	15.9705	15.97045	16.0	2/12/2020
29	K2001173-001	1	0.870	0.2297	0.6406	0.64055	0.6	2/12/2020
30	K2001173-001	1	0.809	0.2297	0.5791	0.57905	0.6	2/12/2020
31	K2001173-002	1	0.854	0.2297	0.6245	0.62445	0.6	2/12/2020
32	K2001173-002	1	0.802	0.2297	0.5720	0.57195	0.6	2/12/2020
33	ccv	1	23.602	0.2297	23.3723	23.37225	23.4	2/12/2020
34	ccb	1	0.110	0.2297	-0.1199	-0.11985	<0.5	2/12/2020
35		1		0.0000	0.0000	0	<0.5	
36		1		0.0000	0.0000	0	<0.5	
37		1		0.0000	0.0000	0	<0.5	
38		1		0.0000	0.0000	0	<0.5	
39		1		0.0000	0.0000	0	<0.5	
40		1		0.0000	0.0000	0	<0.5	
41		1		0.0000	0.0000	0	<0.5	
42		1		0.0000	0.0000	0	<0.5	
43		1		0.0000	0.0000	0	<0.5	
44		1		0.0000	0.0000	0	<0.5	
45		1		0.0000	0.0000	0	<0.5	
46		1		0.0000	0.0000	0	<0.5	
47		1		0.0000	0.0000	0	<0.5	
48		1		0.0000	0.0000	0	<0.5	
49		1		0.0000	0.0000	0	<0.5	
50		1		0.0000	0.0000	0	<0.5	

Analyzed By: BKP	Date Analyzed 2/12/20
Reviewed By:	Date Reviewed 02/13/20

0.240	0.240	0.240	0.240	OBSERVATIONS	4	0.2398
0.220	0.220	0.220	0.220	STD Deviation	0.10922	0.2195
0.376				AVERAGE	0.23625	ABOVE
0.110				UCL	0.34547	BELOW
				LCL	0.12703	BELOW
						BELOW
						BELOW
				OBSERVATIONS	2	BELOW
				STD Deviation	0.06371	BELOW
				AVERAGE	0.22965	BELOW
				UCL	0.29336	BELOW
				LCL	0.16594	BELOW
						BELOW
						BELOW
				OBSERVATIONS	2	BELOW
				STD Deviation	0.06371	BELOW
				AVERAGE	0.22965	BELOW
				UCL	0.29336	BELOW
				LCL	0.16594	BELOW
						BELOW
						BELOW
				OBSERVATIONS	2	BELOW
				STD Deviation	0.02030	BELOW
				AVERAGE	0.22965	BELOW
						BELOW
						BELOW
						BELOW
						BELOW
						BELOW

BCP 2/13/20

02/13/20

TOC: 669413

Schedule: 02112020

Version: 3
Instrument: Fusion1
Last Saved by: Fusion1 (Fusion1)
Last Saved on: 2020/02/11 17:21 - 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
17	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	10	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)	1	True	Ready
C	Check Standard	[TOC] LCS [24.0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
2	Sample	ICS	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
3	Sample	K2001131-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
4	Sample	K2001131-001.01 ms	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
5	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
6	Sample	K2001131-002.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
7	Sample	K2001131-003.01 10x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
8	Sample	K2001131-004.01 200x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
9	Sample	K2001131-005.01 200x	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
10	Sample	K2001132-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
11	Sample	K2001207-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
12	Sample	K2001142-001.07 20x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
13	Sample	K2001142-002.07 20x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
14	Sample	K2001142-004.07	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
15	Sample	K2001173-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
16	Sample	K2001173-002.01	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
18	Sample	K2000749-006.01 100x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
19	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
20	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
21	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
					False	

02/13/20

Fusion Report - 02112020
Tuesday, February 11, 2020 05:21 PM

(View - Reps, Unused Reps, Meta-Data, Signature, History)
Printed on 2020/02/12 09:37 - Wednesday

Report Summary Information

Company Location:	Gen Chem Lab		
Schedule Name:	02112020	Engine Version:	1.1.5.1
Instrument Name:	Fusion1	Firmware Version:	1.2.0696
Report Version:	1 of 1	Connection:	RS232 COM1
Report Creation by Operators (schedule version):	Fusion1 (Fusion1) (v3)		
Comment:			

Report Results

02/13/20

Sample Type: Clean — From Schedule Version 3

	Pos	Analysis Type	Sample ID	Start Time
◆	(clean)		Clean	2020/02/11 17:21

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	13.23	18.14	4.91	49.58	05:22
2	TC Clean	7.03	10.83	3.80	50.07	04:02
3	TC Clean	3.93	7.68	3.75	50.12	03:47
4	TC Clean	2.84	6.65	3.81	50.08	03:46

Sample Type: Clean — From Schedule Version 3

	Pos	Analysis Type	Sample ID	Start Time
◆	(clean)		Clean	2020/02/11 17:42

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	1.37	5.18	3.81	49.48	05:12
2	TC Clean	7.58	11.44	3.86	49.99	03:58
3	TC Clean	3.31	7.28	3.97	50.11	03:48
4	TC Clean	2.85	6.73	3.88	50.09	03:53

Sample Type: Clean From Schedule Version 3

	Pos	Analysis Type	Sample ID	Start Time
◆	(clean)		Clean	2020/02/11 18:04

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	1.24	5.04	3.80	49.66	05:21
2	TC Clean	6.48	10.42	3.94	50.13	03:59
3	TC Clean	3.09	7.04	3.95	50.16	03:44
4	TC Clean	2.53	6.67	4.14	50.12	03:54

Sample Type: Sample From Schedule Version 3

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	17	TOC	RB	0.2539 ppm	0.0972 ppm	38.2900%	2020/02/11 18:26

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.4826	4.8257	13.09	17.15	4.06	50.21	10:29
2	TOC	0.3037	3.0370	11.96	15.99	4.03	50.26	10:27
3	TOC	0.2657	2.6574	11.72	15.70	3.98	50.26	10:27
4	TOC	0.2893	2.8931	11.87	15.68	3.81	50.26	10:27
5	TOC	0.2686	2.6859	11.74	15.57	3.84	50.24	10:29
6	TOC	0.2488	2.4882	11.61	15.49	3.88	50.23	10:30
7	TOC	0.1772	1.7717	11.16	15.28	4.12	50.23	10:27
8	TOC	0.1765	1.7654	11.15	15.08	3.92	50.20	10:28
9	TOC	0.1751	1.7512	11.14	15.06	3.92	50.22	10:27
10	TOC	0.1511	1.5108	10.99	14.76	3.76	50.22	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.0378 (IC) (v1350)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

Sample Type: Blank (Creating v1351) From Schedule Version 3

	Pos	Analysis Type	Sample ID	Start Time
◆	(blank)		Reagent/Acid Blank	2020/02/11 20:47

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	12.35	17.94	5.59	49.72	05:22
2	TC Clean	4.69	8.46	3.78	50.15	04:03
3	TC Clean	2.33	6.04	3.71	49.93	03:44

4	TC Clean	1.92	5.62	3.70	50.12	03:46
5	Reagent Blank	11.14	14.94	3.79	50.05	05:04
6	Acid Blank	2.46	6.16	3.70	49.61	05:28

Sample Type: Sample From Schedule Version 3

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	D	TOC	RB	0.4838 ppm	0.0000 ppm	0.0000%	2020/02/11 21:20

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.4838	4.8383	12.98	16.92	3.94	50.18	10:32

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.9228 (IC) (v1351)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 3

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	23.8159 ppm (PASS)	0.0000 ppm	0%	2020/02/11 21:35

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	23.8159	238.1592	160.78	164.66	3.87	50.19	10:30

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)	50 ppmC

Sample Type: Check Standard --> CCB From Schedule Version 3

	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)	0.2398 ppm (PASS)	0.0000 ppm	0%	2020/02/11 21:50

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.2398	2.3976	11.72	15.61	3.90	50.19	10:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)	0 ppmC

Sample Type: Sample From Schedule Version 3

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	1	TOC	MB1	0.2195 ppm	0.0000 ppm	0.0000%	2020/02/11 22:05

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.2195	2.1955	11.31	15.12	3.81	50.14	10:33

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.9228 (IC) (v1351)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

Sample Type: Check Standard --> LCS From Schedule Version 3

	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)	25.5946 ppm (PASS)	0.0000 ppm	0%	2020/02/11 22:19

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	25.5946	255.9456	172.03	175.66	3.63	50.16	10:35

Completion State	Success Action	Method	Calibration	STD Conc - Pos C
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)	25 ppmC

Sample Type: Sample From Schedule Version 3

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	2	TOC	ICS	1.0184 ppm	0.0000 ppm	0.0000%	2020/02/11 22:34

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.0184	10.1840	16.36	20.15	3.78	50.09	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.9228 (IC) (v1351)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	3	TOC	K2001131-001.01	4.1982 ppm	0.0030 ppm	0.0700%	2020/02/11 22:49

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.2004	42.0036	36.48	40.40	3.92	50.10	10:26
2	TOC	4.1961	41.9609	36.45	40.30	3.85	50.09	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.9228 (IC)	CAS_salt_010711	CAS_salt_010711

(v1351) (v4) (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	4	TOC	K2001131-001.01 ms	33.2432 ppm	0.0000 ppm	0.0000%	2020/02/11 23:17

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	33.2432	332.4322	220.11	224.03	3.92	50.06	10:33

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.9228 (IC) (v1351)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	5	TOC	RB	0.4573 ppm	0.0000 ppm	0.0000%	2020/02/11 23:32

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.4573	4.5726	12.81	16.63	3.81	50.07	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.9228 (IC) (v1351)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	6	TOC	K2001131-002.01	5.2102 ppm	0.2264 ppm	4.3400%	2020/02/11 23:46

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	5.0501	50.5014	41.85	45.90	4.05	50.05	10:27
2	TOC	5.3703	53.7025	43.88	47.74	3.86	50.05	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.9228 (IC) (v1351)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	7	TOC	K2001131-003.01 10x	7.6632 ppm	0.1624 ppm	2.1200%	2020/02/12 00:14

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	7.7780	77.7803	59.10	63.02	3.91	50.05	10:27
2	TOC	7.5484	75.4839	57.65	61.28	3.63	50.03	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.9228 (IC) (v1351)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	8	TOC	K2001131-004.01 200x	4.6206 ppm	0.0013 ppm	0.0300%	2020/02/12 00:42

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.6196	46.1964	39.13	42.80	3.67	50.04	10:28
2	TOC	4.6215	46.2153	39.14	42.91	3.77	50.03	10:26

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	9	TOC	K2001131-005.01 200x	4.7654 ppm	0.0015 ppm	0.0300%	2020/02/12 01:10

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.7664	47.6641	40.06	43.82	3.76	50.03	10:27
2	TOC	4.7644	47.6435	40.05	43.78	3.74	50.02	10:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.9228 (IC) (v1351)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 3

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	24.0347 ppm (PASS)	0.0000 ppm	0%	2020/02/12 01:38

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.0347	240.3465	162.17	166.02	3.86	50.00	10:29

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)	50 ppmC

Sample Type: Check Standard --> CCB From Schedule Version 3

	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)	0.3759 ppm (PASS)	0.0000 ppm	0%	2020/02/12 01:53

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.3759	3.7593	12.58	16.47	3.89	50.02	10:28

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)	0 ppmC

Sample Type: Sample From Schedule Version 3

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	10	TOC	K2001132-001.01	2.6312 ppm	0.0574 ppm	2.1800%	2020/02/12 02:08

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.6718	26.7177	26.82	30.52	3.71	50.00	10:29
2	TOC	2.5906	25.9064	26.30	30.00	3.70	49.98	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.9228 (IC) (v1351)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	11	TOC	K2001207-001.01	0.3527 ppm	0.0557 ppm	15.7900%	2020/02/12 02:36

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.3921	3.9210	12.40	16.20	3.80	50.03	10:26
2	TOC	0.3133	3.1334	11.90	15.57	3.67	50.00	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.9228 (IC) (v1351)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	12	TOC	K2001142-001.07 20x	2.4883 ppm	0.0356 ppm	1.4300%	2020/02/12 03:04

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.5135	25.1346	25.82	29.31	3.50	50.00	10:30
2	TOC	2.4632	24.6316	25.50	29.22	3.73	50.01	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.9228 (IC) (v1351)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	13	TOC	K2001142-002.07 20x	4.1683 ppm	0.0309 ppm	0.7400%	2020/02/12 03:32

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.1464	41.4643	36.14	39.79	3.65	49.99	10:25
2	TOC	4.1901	41.9008	36.42	40.09	3.67	49.99	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.9228 (IC) (v1351)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	14	TOC	K2001142-004.07	16.1717 ppm	0.0400 ppm	0.2500%	2020/02/12 04:00

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	16.1434	161.4344	112.00	115.70	3.71	50.00	10:27
2	TOC	16.2001	162.0006	112.35	115.97	3.61	49.98	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.9228 (IC) (v1351)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	15	TOC	K2001173-001.01	0.8394 ppm	0.0435 ppm	5.1800%	2020/02/12 04:28

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.8702	8.7021	15.42	18.98	3.56	49.99	10:27
2	TOC	0.8087	8.0868	15.04	18.70	3.66	49.99	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.9228 (IC) (v1351)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	16	TOC	K2001173-002.01	0.8278 ppm	0.0371 ppm	4.4900%	2020/02/12 04:56

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.8541	8.5407	15.32	19.09	3.77	50.00	10:25
2	TOC	0.8016	8.0157	14.99	18.62	3.63	49.99	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.9228 (IC) (v1351)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 3

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	23.6019 ppm (PASS)	0.0000 ppm	0%	2020/02/12 05:24

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	23.6019	236.0193	159.43	163.01	3.58	49.97	10:32

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)	50 ppmC

Sample Type: Check Standard --> CCB From Schedule Version 3

	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)	0.1098 ppm (PASS)	0.0000 ppm	0%	2020/02/12 05:39

Pos	Base Analysis	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time

	Type									
D	TOC	0 ppm	1	0.1098	1.0975	10.89	14.61	3.71	49.98	10:30

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)	0 ppmC

Sample Type: Sample From Schedule Version 3

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	18	TOC	K2000749-006.01 100x	2.6677 ppm	0.0004 ppm	0.0200%	2020/02/12 05:54

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.6673	26.6735	26.79	30.50	3.71	50.00	10:28
2	TOC	2.6680	26.6798	26.79	30.47	3.67	49.97	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.9228 (IC) (v1351)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	19	TOC	RB	0.0566 ppm	0.0224 ppm	39.4800%	2020/02/12 06:22

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0725	0.7246	10.38	13.96	3.58	50.02	10:26
2	TOC	0.0408	0.4083	10.18	13.87	3.69	50.00	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.9228 (IC) (v1351)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 3

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	20	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2020/02/12 06:50

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
20	TOC	25 ppm	1	0.0000	0.0000	9.56	13.36	3.79	50.00	10:33

Completion State	Success Action	Method	Calibration	STD Conc - Pos 20
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)	50 ppmC

Sample Type: Check Standard --> CCB From Schedule Version 3

			Concentration			Min / Max				

	Pos	BAT	(ppm)	Dil	Sample ID	(% dev)	Result	Std. Dev.	RSD	Start Time
◆	21	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2020/02/12 07:04

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
21	TOC	0 ppm	1	0.0000	0.0000	10.00	13.80	3.80	50.01	10:27

Completion State	Success Action	Method	Calibration	STD Conc - Pos 21
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)	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
v1350	4.2887	2.5180	0.0000	0.0000	0.0000	2020/02/11 16:58	Fusion1 (Fusion1)
v1351	3.7140	2.4650	0.0000	0.0000	0.0000	2020/02/11 21:20	Fusion1 (Fusion1)

Calibrations

Name: CAS_salt_010711 (TOC)

Version:	v31	Calibration curve formula:	TOC: y = 6.323x + 10.200
Ver Creation:	2020/01/07 14:30	r^2 value:	TOC: r^2 = 0.99991
Comment:			
Operator:	Fusion1 (Fusion1)		
Basic Analysis Type	TOC		

Basic Analysis Type: TOC

Sample ID	Y Raw Value	X Expected	Message	End Time
DI Water	9.5850	0.0000		2020/01/07 13:02
0.500 ppm	12.6160	0.5000		2020/01/07 13:17
1.0 ppm	15.6440	1.0000		2020/01/07 13:31
5.0 ppm	43.7700	5.0000		2020/01/07 13:45
10 ppm	73.2770	10.0000		2020/01/07 14:00
25 ppm	169.4210	25.0000		2020/01/07 14:14
50 ppm	325.6260	50.0000		2020/01/07 14:28

Methods

Name: CAS_salt_010711 (TOC)

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

Parameter	Value
SampleVolume	10.0 mL
Dilution	1:10
AcidVolume	0.5 ml
ReagentVolume	2.0 ml
UVReactorPrerinse	Off
UVReactorPrerinseVolume	5.0
NumberOfUVReactorPrerinses	1
ICSpargeTime	1.00 mins
DetectorSweepFlow	500 ml/min
PreSpargeTime	2.00 mins
SystemFlow	500 ml/min

Advanced Parameter	Value
NeedleRinseVolume	5.0 ml
VialPrimeVolume	2.0 ml
ICSamplePrimeVolume	2.0 ml
ICSpargeRinseVolume	12.0 ml
BaselineStabilizeTime	0.70 min
DetectorPressureFlow	150 ml/min
SyringeSpeedWaste	10
SyringeSpeedAcid	7
SyringeSpeedReagent	7
SyringeSpeedDIWater	7
NDIRPressurization	60 psig
SyringeSpeedSampleDispense	5
SyringeSpeedSampleAspirate	4
SyringeSpeedUVDispense	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	2020/02/12 07:19

ALS Environmental

StarLIMS Run: 669413

Analysis: DOC/TOC

Method: SM 5310 C, 9060A, 415.1, 9060

CCV: 11-GEN-05-82C 50 ppm LCS: 11-GEN-05-79J 25.0 ppm

ICAL Date: 1/7/2020

ICAL ID: 11-GEN-05-83-K->O/84-A/11-GEN-05-84-C->H

ICS ID: 11-GEN-05-78M

ICS TV: 25.0 ppm ICS % R < 1

Spike ID: 11-GEN-05-82C 0.05 ml of 5000 ppm stock ---> 10.0 ml = 25.0 ppm x dilution factor

Sodium Persulfate: 19-GEN-08-4-K

21 % H3PO4: 19-GEN-08-4-L

Equipment ID: K-TOC-03

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

FILTER ID: 16967789

11 BW 2/13/20

Analyzed By: BW	Date Analyzed: 2/13/20
Reviewed By:	Date Reviewed: 02/13/20

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

February 19, 2020

Marcia Olive
Bhate Environmental Associates, Inc.
445 Union Blvd Ste 129
Lakewood, CO 80228

Work Order: **HS20020472**

Laboratory Results for: **Longhorn GW Treatment Plant Monthly Influent Samples**

Dear Marcia,

ALS Environmental received 1 sample(s) on Feb 12, 2020 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: 19-Feb-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Monthly Influent Samples
Work Order: HS20020472

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS20020472-01	LH18/24-SP140_021120	Water		11-Feb-2020 14:00	12-Feb-2020 09:05	☐

ALS Houston, US Date: 19-Feb-20

Client: Bhate Environmental Associates, Inc. **CASE NARRATIVE**
Project: Longhorn GW Treatment Plant Monthly Influent Samples
Work Order: HS20020472

Work Order Comments

• The analysis for Perchlorate was subcontracted to ALS Salt Lake City, UT. Final report attached.

Metals by Method SW6020

Batch ID: 150591

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

WetChemistry by Method SW7196

Batch ID: R356187

Sample ID: HS20020474-01MS

• MS and MSD are for an unrelated sample

ALS Houston, US Date: 19-Feb-20

Client: Bhate Environmental Associates, Inc.
ANALYTICAL REPORT
Project: Longhorn GW Treatment Plant Monthly Influent Samples
WorkOrder:HS20020472
Sample ID: LH18/24-SP140_021120
Lab ID:HS20020472-01
Collection Date: 11-Feb-2020 14:00
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 13-Feb-2020		Analyst: JHD
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	19-Feb-2020 13:40
Silver	**0.000314**	J	**0.000200**	**0.000500**	**0.00500**	**mg/L**	1	19-Feb-2020 13:40
HEXAVALENT CHROMIUM BY SW7196A		**Method:SW7196**						Analyst: MZD
Chromium, Hexavalent	0.0100	U	0.00600	0.0100	0.0100	mg/L	1	12-Feb-2020 12:09
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	19-Feb-2020 09:28

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

Weight / Prep Log

Client: Bhate Environmental Associates, Inc.

Project: Longhorn GW Treatment Plant Monthly Influent Samples

WorkOrder: HS20020472

Batch ID: 150591 **Start Date:** 13 Feb 2020 09:09 **End Date:** 13 Feb 2020 13:00

Method: WATER - SW3010A **Prep Code:** 3010A

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS20020472-01		10 (mL)	10 (mL)	1

ALS Houston, US Date: 19-Feb-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Monthly Influent Samples
WorkOrder: HS20020472

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: 150591 (0)	**Test Name :** METALS BY ICPMS BY SW6020A				**Matrix:** Water	
HS20020472-01	LH18/24-SP140_021120	11 Feb 2020 14:00		13 Feb 2020 13:00	19 Feb 2020 13:40	1
Batch ID: R356187 (0)	**Test Name :** HEXAVALENT CHROMIUM BY SW7196A				**Matrix:** Water	
HS20020472-01	LH18/24-SP140_021120	11 Feb 2020 14:00			12 Feb 2020 12:09	1
Batch ID: R356523 (0)	**Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)				**Matrix:** Water	
HS20020472-01	LH18/24-SP140_021120	11 Feb 2020 14:00			19 Feb 2020 09:28	1

ALS Houston, US Date: 19-Feb-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Monthly Influent Samples
WorkOrder: HS20020472

QC BATCH REPORT

Batch ID: 150591 (0) **Instrument: ICPMS05** **Method: METALS BY ICPMS BY SW6020A**

MBLK Sample ID: **MBLK-150591** Units: **mg/L** Analysis Date: **19-Feb-2020 13:35**
Client ID: Run ID: **ICPMS05_356564** SeqNo: **5479002** PrepDate: **13-Feb-2020** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Selenium	0.00250	0.00500								U
Silver	0.000500	0.00500								U

LCS Sample ID: **LCS-150591** Units: **mg/L** Analysis Date: **19-Feb-2020 13:38**
Client ID: Run ID: **ICPMS05_356564** SeqNo: **5479003** PrepDate: **13-Feb-2020** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Selenium	0.04785	0.00500	0.05	0	95.7	80 - 120				
Silver	0.04722	0.00500	0.05	0	94.4	85 - 116				

MS Sample ID: **HS20020474-01MS** Units: **mg/L** Analysis Date: **19-Feb-2020 13:47**
Client ID: Run ID: **ICPMS05_356564** SeqNo: **5479007** PrepDate: **13-Feb-2020** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Selenium	0.04852	0.00500	0.05	0.000303	96.4	80 - 120				
Silver	0.04626	0.00500	0.05	0.000017	92.5	85 - 116				

MSD Sample ID: **HS20020474-01MSD** Units: **mg/L** Analysis Date: **19-Feb-2020 13:49**
Client ID: Run ID: **ICPMS05_356564** SeqNo: **5479008** PrepDate: **13-Feb-2020** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Selenium	0.04608	0.00500	0.05	0.000303	91.6	80 - 120	0.04852	5.15	20	
Silver	0.04399	0.00500	0.05	0.000017	87.9	85 - 116	0.04626	5.03	20	

PDS Sample ID: **HS20020474-01PDS** Units: **mg/L** Analysis Date: **19-Feb-2020 13:51**
Client ID: Run ID: **ICPMS05_356564** SeqNo: **5479009** PrepDate: **13-Feb-2020** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Selenium	0.1107	0.00500	0.1	0.000303	110	80 - 120				

ALS Houston, US Date: 19-Feb-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Monthly Influent Samples
WorkOrder: HS20020472

QC BATCH REPORT

Batch ID: 150591 (0) **Instrument: ICPMS05** **Method: METALS BY ICPMS BY SW6020A**

SD Sample ID: **HS20020474-01SD** Units: **mg/L** Analysis Date: **19-Feb-2020 13:44**
Client ID: Run ID: **ICPMS05_356564** SeqNo: **5479006** PrepDate: **13-Feb-2020** DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Selenium	0.0125	0.0250					0.000303	0	10	U
Silver	0.00250	0.0250					0.000017	0	10	U

The following samples were analyzed in this batch: HS20020472-01

ALS Houston, US Date: 19-Feb-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Monthly Influent Samples
WorkOrder: HS20020472

QC BATCH REPORT

Batch ID: R356187 (0) **Instrument: UV-2450** **Method: HEXAVALENT CHROMIUM BY SW7196A**

MBLK Sample ID: **MBLK-356187** Units: **mg/L** Analysis Date: **12-Feb-2020 12:09**
Client ID: Run ID: **UV-2450_356187** SeqNo: **5470706** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chromium, Hexavalent	0.0100	0.0100								U

LCS Sample ID: **LCS-356187** Units: **mg/L** Analysis Date: **12-Feb-2020 12:09**
Client ID: Run ID: **UV-2450_356187** SeqNo: **5470707** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chromium, Hexavalent	0.266	0.0100	0.25	0	106	90 - 111				

MS Sample ID: **HS20020474-01MS** Units: **mg/L** Analysis Date: **12-Feb-2020 12:09**
Client ID: Run ID: **UV-2450_356187** SeqNo: **5470708** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chromium, Hexavalent	0.215	0.0100	0.25	-0.001	86.4	90 - 111				S

MSD Sample ID: **HS20020474-01MSD** Units: **mg/L** Analysis Date: **12-Feb-2020 12:09**
Client ID: Run ID: **UV-2450_356187** SeqNo: **5470709** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chromium, Hexavalent	0.241	0.0100	0.25	-0.001	96.8	90 - 111	0.215	11.4	20	

The following samples were analyzed in this batch: HS20020472-01

ALS Houston, US Date: 19-Feb-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Monthly Influent Samples
WorkOrder: **HS20020472**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	19-028-0	27-Mar-2020
California	2919, 2019-2020	30-Apr-2020
Dept of Defense	ANAB L2231 V009	22-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	624-2020	31-Dec-2020
North Dakota	R-193 2019-2020	30-Apr-2020
Oklahoma	2019-067	31-Aug-2020
Texas	T104704231-19-25	30-Apr-2020

ALS Houston, US Date: 19-Feb-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Monthly Influent Samples
Work Order: HS20020472

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS20020472-01	LH18/24-SP140_021120	Login	2/12/2020 10:54:59 AM	PMG	Sub
HS20020472-01	LH18/24-SP140_021120	Login	2/12/2020 10:54:59 AM	PMG	WET243
HS20020472-01	LH18/24-SP140_021120	Login	2/12/2020 10:54:59 AM	PMG	MET059

ALS Houston, US Date: 19-Feb-20

Sample Receipt Checklist

Client Name: Bhate Environmental
Work Order: HS20020472
Date/Time Received: **12-Feb-2020 09:05**
Received by: **AC**

Checklist completed by: *Paresh M. Giga* eSignature — 12-Feb-2020 Date
Reviewed by: *RJ Modashia* eSignature — 12-Feb-2020 Date

Matrices: **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):	0.9c U/C	IR25
Cooler(s)/Kit(s):	45571	
Date/Time sample(s) sent to storage:	2/12/2020 11:05	

Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

CHAIN OF CUSTODY

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

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

Project No. NWO1312.0150.0 16.0001

Job:
GROUNDWATER TREATMENT PLANT MONTHLY INFLUENT SAMPLES

Prepared By: Scott Beesinger

P.O. Number

HS20020472
Bhate Environmental Associates, Inc.
Longhorn GW Treatment Plant Monthly Influent Sample

Field Sample I.D.	Sample Matrix	Date / Time	MS / MSD	No. OF CONTAINERS	Analyses: SILVER & SELENIUM	HEXAVALENT CHROMIUM	PERCHLORATE								Remarks (Preservatives, etc.)	Lab I.D.#
LH18/24-SP140_021120	Water	02/11/20 / 14:00		1	X										HNO3	
LH18/24-SP140_021120	Water	02/11/20 / 14:00		2		X	X								NONE	

Additional Remarks: **STANDARD TURN AROUND TIME**

Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
Scott Beesinger	02/11/20	14:30	AC	2/12/2020	09:05						

For Lab Use Only

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

Remarks: O/C 0.9 IR#25 CF0.0 45571

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

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

45571

CUSTODY SEAL

Date: 2/11/20 Time: 1430
Name: Scott Beesinger
Company: BHATE

Seal Broken By: SM
Date: 02/12/20

45571

Must Deliver Next Business
Time and Tempature Sensitive!

45571

ORIGIN ID:SGRA (303) 597-2450
SCOTT BEESINGER
BHATE ENVIRONMENTAL ASSOCIATES
1203-B EAST GRAND AVE.
PMB202
MARSHALL, TX 75670
UNITED STATES US

SHIP DATE: 09JAN20
ACTWGT: 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) 530-5656
REF: LONGHORN - RJ

RMA:

FedEx Express

FedEx
TRK# 0221 1251 0293 5906

WED - 12 FEB 10:30A
PRIORITY OVERNIGHT

AB SGRA

77099
TX-US
IAH

FID 3079314 11FEB20 GGGA 56AC2/049C/05A2

Case Narrative

Method: 6850
Analysis: Perchlorate
Analysis SOP: LC-MS-CLO4
ALS WO ID(s): 2004545; 2004546; 2004547; 2004548

Client: ALS Laboratories (Houston, TX)
Matrix: Water
ELMS Batch (HBN): 2350 (257242)

General Set Information: There were nineteen 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. 50µL 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 0.45µm Syringe filters.

Holding Times: Holding times were met for all analyses.

Dilutions: Field sample 2004545001 was analyzed and reported from a 1:1,000 dilution. Field sample 2004548012 was re-analyzed and reported from a 1:10 dilution. The reporting limits have been adjusted accordingly.

Method QC data: The method blank (LMB 695966) was less than 1/2 the CRDL. The recovery for the LCS (695963) was within acceptable parameters.

MS/MSD Analysis: MS/MSD was performed on samples 2004548015/16 (Client ID: 04WW11-200204). 3.0µL of Working Standard Solution Horizon ID 49947 was added to 10.0mL of sample preparation. The spike target was 3.µg/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 µg/L. Results were calculated in µg/L by the equation (A)x(B),

where: A = Analyte concentration from the standard curve (µg/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 – 695964) is reported from the analysis of the Laboratory Control Sample (LCS – 695963) at a level of 3.0µg/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 17JAND16/20/27. Field sample 2004548008 was re-analyzed at a 1:5 dilution and undiluted to confirm the positive result and split peak chromatography.

Thomas Bosch — Analyst
February 18, 2020 — Date

ANALYTICAL REPORT

Report Date: February 18, 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: **34-2004545**
Project ID: HS20020472
Purchase Order: HS20020472
Project Manager Kevin W. Griffiths

Client Sample ID	Lab ID	Collect Date	Receive Date	Sampling Site
LH18/24-SP140_021120	2004545001	02/11/20	02/13/20	HS20020472-01

ANALYTICAL REPORT

Workorder: 34-2004545
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: **LH18/24-SP140_021120** | Sampling Site: HS20020472-01 | Collected: 02/11/2020
Lab ID: 2004545001 | Media: 125 mL Nalgene | Received: 02/13/2020
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2350 (HBN: 257242) | **%Solids:** NA
Analyzed: 02/17/2020 15:22 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	**11000**	1000	2000	4000	1000	

Comments

Workorder: 2004545

Field sample 2004545001 was analyzed and reported from a 1:1,000 dilution. The reporting limit has 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 02/18/2020 09:40	/S/ Stephen Brose 02/18/2020 13:55

Laboratory Contact Information

ALS Environmental
960 W Levoy Drive
Salt Lake City, Utah 84123

Phone: (801) 266-7700
Email: alslt.lab@ALSGlobal.com
Web: www.alsslc.com

ANALYTICAL REPORT

Workorder: 34-2004545
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.
The following was provided by the client: Sample ID, Collection Date, Sampling Location, Media Type, Sampling Parameter.
Collection Date, Media Type, and Sampling Parameter can potentially affect the validity of the results.
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

Analysis Information

Workorder: 2004545

Limits:	Client SOW/Contract Specified	**Preparation:**	NA	**Analysis:**	EPA 6850, DoD QSM
Basis:	DoD QSM	**Batch:**	NA	**Batch:**	ELMS/2350 (HBN: 257242)
		Prepared By:	NA	**Analyzed By:**	Thomas Bosch

Blank

LMB: 695966
Analyzed: 02/17/2020 09:30
Units: ug/L

Analyte	Result	MDL	RL
Perchlorate	ND	1	2.00

Laboratory Control Sample

LCS: 695963
Analyzed: 02/17/2020 09:02
Dilution: 1
Units: ug/L

Analyte	Result	Target	% Rec	QC Limits	
Perchlorate	2.99	3.00	99.8	78.8	123.8

Matrix Spike - Matrix Spike Duplicate

Sample:	2004548009	**MS:**	2004548015	**MSD:**	2004548016
Analyzed:	02/17/2020 12:30	**Analyzed:**	02/17/2020 14:54	**Analyzed:**	02/17/2020 15:08
Dilution:	1	**Dilution:**	1	**Dilution:**	1
Units:	ug/L	**Units:**	ug/L	**Units:**	ug/L

Analyte	Result	Result	Target	% Rec	QC Limits		Result	% Rec	RPD	QC Limits	
Perchlorate	ND	3.2	3	107	78.8	123.8	3.1	105	3.17	0.0	20.0

QC Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Analyst	Peer Review
/S/ Thomas Bosch	/S/ Stephen Brose
02/18/2020 09:45	02/18/2020 13:55

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

2004545

18698/#2

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID:** **13317**

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:	
Email:	

INVOICE INFORMATION:

Company:	ALS Houston
Contact:	Accounts Payable
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Reference:	HS20020472
TSR:	Danielle Winnings

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS20020472-01**	**LH18/24-SP140_021120**	**Water**	**11 Feb 2020 14:00**
	SUB_Perch-6850			20 Feb 2020

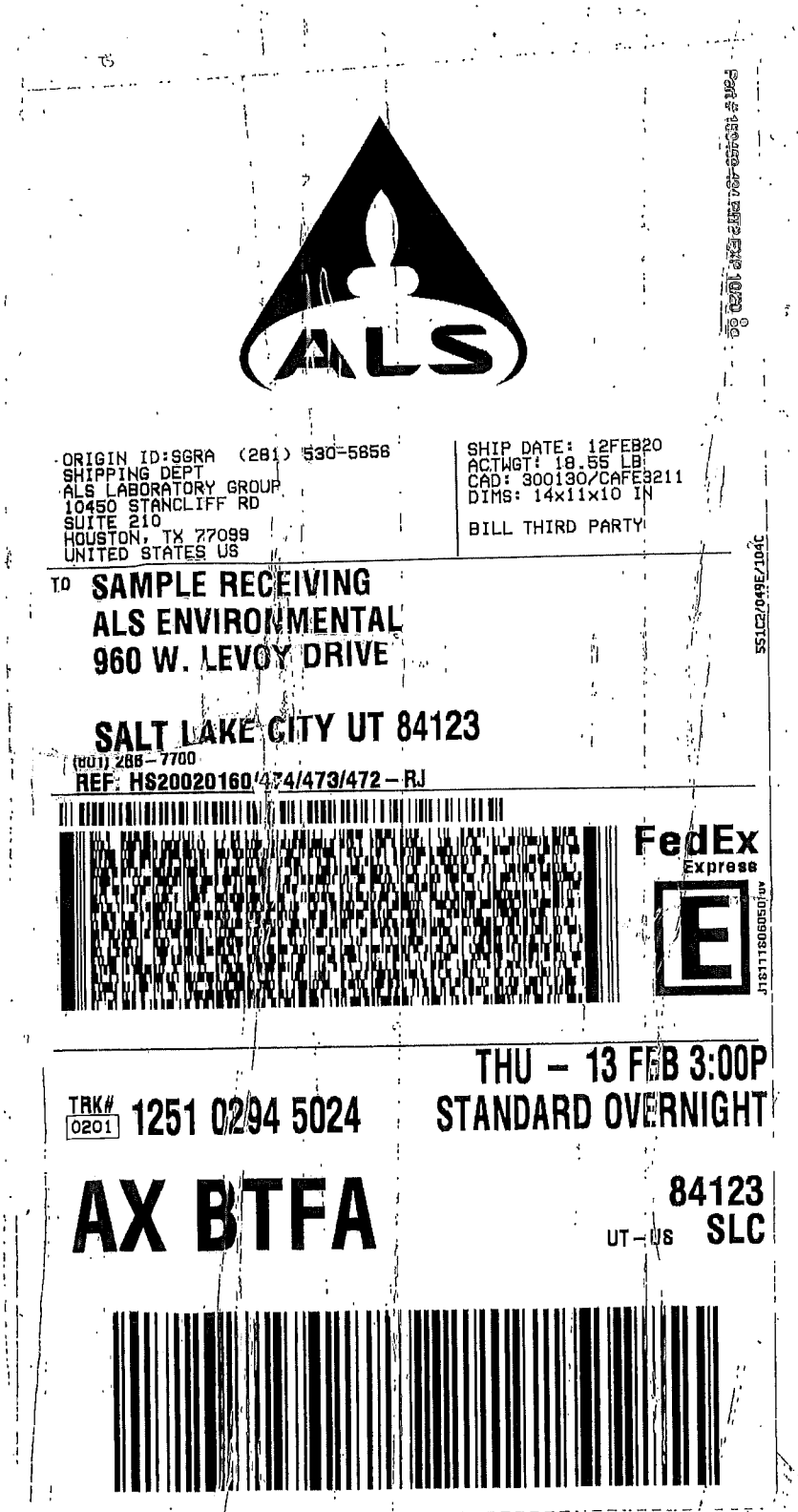
Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.

QC Level: DOD IV (DoD Data Package)

Relinquished By: NA Date/Time: 2.12.20 18:30

Received By: Jennifer Jessell Date/Time: 02-13-20 9:46

Cooler ID(s): Temperature(s):



ORIGIN ID:SGRA (281) 530-5856
SHIPPING DEPT
ALS LABORATORY GROUP
10450 STANCLIFF RD
SUITE 210
HOUSTON, TX 77099
UNITED STATES US

SHIP DATE: 12FEB20
ACTWGT: 18.55 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) 266-7700
REF: HS20020160/474/473/472-RJ

FedEx Express

THU - 13 FEB 3:00P
STANDARD OVERNIGHT

TRK# 0201 1251 0294 5024

AX BTFA

84123
UT-US SLC

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: 02-13-20 9:46

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 Frozen/Melted/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	good	2 °C	4		°C	7		°C
2		°C	5		°C	8		°C
3		°C	6		°C	9		°C

Taken By: [signature] (Signature) T. Vartassell (Printed Name) 02-13-20 (Date)

CLIENT-RELATED INFORMATION

☐ Missing Cooler	☐ Missing Samples/Bottles	☐ Incorrect Preservation	☐ Insufficient Sample Volume
☐ Cooler Conditions	☐ Broken/Leaking Samples	☐ pH Criteria Not Met	☐ Chain of Custody Problems
☐ Missing Paperwork	☐ Incorrect Bottle Type	☐ Residual Chlorine Present	☐ Other:
☐ Missing/Incorrect Bottle Labels	☐ Cooler Temperatures Out of Range	☐ 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: _____ (Printed Name) Returned to Sample Receipt by: _____ (Signature) Date: _____

Batch Worklist

Batch: ELMS/ 2350
Rule: EPA 6850, DoD QSM Water

Created: 2/17/2020 07:43
Analyst: T. Bosch

Instrument:
Status: WP

HBN: 257242

Workorder: 2004545 [ENV_LVL4]
Workorder: 2004546 [ENV_LVL4]
Workorder: 2004547 [ENV_LVL4]
Workorder: 2004548 [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	695962	CCV for HBN 257242 [ELMS/2350]				CCV	3		E685041C3Q	5311		2/26/2020	
2	695963	LCS for HBN 257242 [ELMS/2350]				LCS	3		E6850Q413Q	5311		2/26/2020	
3	695964	RLVS for HBN 257242 [ELMS/2350				RLVS	3		E685041C3Q	5311		2/26/2020	
4	695965	ICS for HBN 257242 [ELMS/2350]				ICS	3		E6850..D3Q	5311		2/26/2020	
5	695966	LMB for HBN 257242 [ELMS/2350]				LMB	3		E6850Q413Q	5311		2/26/2020	
6	2004545001	LH18/24-SP140_021120				SAMPLE	3	2004545001-A	E6850Q41.3	5480	3/10/2020	2/26/2020	
7	2004546001	LH18/24-SP650_021120_BIX Water				SAMPLE	3	2004546001-A	E6850Q41.3	5480	3/10/2020	2/26/2020	
8	2004547001	LH18/24-SP650_021120_BIX Water				SAMPLE	3	2004547001-A	E6850Q41.3	5480	3/10/2020	2/26/2020	
9	2004548001	LHSMW01-200203				SAMPLE	3	2004548001-A	E6850Q41.3	5480	3/2/2020	2/26/2020	
10	2004548002	04WW08-200203				SAMPLE	3	2004548002-A	E6850Q41.3	5480	3/2/2020	2/26/2020	
11	2004548003	04WW04-200203				SAMPLE	3	2004548003-A	E6850Q41.3	5480	3/2/2020	2/26/2020	
12	2004548004	04WW06-200203				SAMPLE	3	2004548004-A	E6850Q41.3	5480	3/2/2020	2/26/2020	
13	2004548005	LHSMW02-200203				SAMPLE	3	2004548005-A	E6850Q41.3	5480	3/2/2020	2/26/2020	
14	2004548006	LHSMW02-200203-FD				SAMPLE	3	2004548006-A	E6850Q41.3	5480	3/2/2020	2/26/2020	
15	2004548007	04WW02-200203				SAMPLE	3	2004548007-A	E6850Q41.3	5480	3/2/2020	2/26/2020	
16	695967	CCV for HBN 257242 [ELMS/2350]				CCV	3		E685041C3Q	5311		2/26/2020	
17	2004548008	04WW01-200204				SAMPLE	3	2004548008-A	E6850Q41.3	5480	3/3/2020	2/26/2020	
18	2004548009	04WW11-200204				SAMPLE	3	2004548009-A	E6850Q41.3	5480	3/3/2020	2/26/2020	
19	2004548010	04WW05-200204				SAMPLE	3	2004548010-A	E6850Q41.3	5480	3/3/2020	2/26/2020	
20	2004548011	04WW10-200204				SAMPLE	3	2004548011-A	E6850Q41.3	5480	3/3/2020	2/26/2020	
21	2004548012	04WW07-200204				SAMPLE	3	2004548012-A	E6850Q41.3	5480	3/3/2020	2/26/2020	
22	2004548013	04WW09-200204				SAMPLE	3	2004548013-A	E6850Q41.3	5480	3/3/2020	2/26/2020	
23	2004548014	04WW09-200204-FD				SAMPLE	3	2004548014-A	E6850Q41.3	5480	3/3/2020	2/26/2020	
24	2004548015	04WW11-200204 MS				MS	3	2004548015-A	E6850Q41.3	5480	3/3/2020	2/26/2020	
25	2004548016	04WW11-200204 MSD				MSD	3	2004548016-A	E6850Q41.3	5480	3/3/2020	2/26/2020	
26	695968	CCV for HBN 257242 [ELMS/2350]				CCV	3		E685041C3Q	5311		2/26/2020	

00969342

Batch Worklist

Pos	Lab ID	Sample ID	Prep Initial	Prep Final	Dust Weight	Type	Mx	Container	Procedure	Mgr	Expire Date	Due Date	Run Date
27	696082	CCV for HBN 257242 [ELMS/2350]				CCV	3		E685041C3Q	5311		2/26/2020	

00969343



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Analytical Documentation

Analyst Write-up

ALS Work Order #'s & Sample #( )'s: 2004545 (001); 2004546 (001); 2004547 (001); 2004548 (001-16)
ELMS Batch/HBN ID: 2350 (256242)
Prep Date: 02/14/2020 Analysis Date: 02/17/2020 Analyst: Tom Bosch
Analyte: **Perchlorate** Matrix: **Water** Method: **6850**
Sequence: \\HPCHEM\1\SEQUENCE\CLO4\2020\FEB\17FEB20D.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 695963; Target = 3.0µg/L. ASTM type II water was used for LMB 695966.

MS/MSD: The Matrix Spike and duplicate (MS/MSD) was performed on samples 2004548015/16 (Client ID: 04WW11-200204). 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 2004545001 was analyzed and reported from a 1:1,000 dilution. Field sample 2004548012 was re-analyzed and reported from a 1:10 dilution. The reporting limits have been adjusted accordingly. Field sample 2004548008 was re-analyzed at a 1:5 dilution and undiluted to confirm the positive result and split peak chromatography.
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\2020\FEB\HBN# or through NuGenesis\Tree\PrintData\LCMS\DefaultView.
4) Notebook: \\alsltws013\ORGANIC\BOSCH\LCMS\Perchlorates\Waters\2020\DOD\256242-DoD-ALS-Hstn LCMS4 or through \\ALSLTWS013\DATAREVIEW\HBN#
5) The Reporting Limit Verification Standard (RLVS – 695964) is reported from the analysis of the Laboratory Control Sample (LCS – 695963) 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 17JAND16/20/27.

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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 **Batch(es)/SDG:** ELMS: 2350 HBN: 257242 **Sample Set IDs if Applicable:** 2004545/2004546/2004547/2004548	**Analyst Initials**	**Reviewer Initials**
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
MFG: ALS/SLC
MFG Lot: TNB: 09/20/2019
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 09/20/2019 03:09PM

Amount: 10 mL
Expires: 07/25/2020
Usable: Yes
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
MFG: ALS/SLC
MFG Lot: TNB: 05/06/2019
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 05/06/2019 03:05PM

Amount: 10 mL
Expires: 03/31/2020
Usable: Yes
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

S 43659

AccuTrace™ Reference Standard

Catalog No: IC-PER-10X-1
Description: Perchlorate Standard
Element: Perchlorate (ClO_4)
SRM: Ind. Std.
Lot: 218065075
Matrix: Water
Hazards: *Refer to SDS for complete safety information*

Signal Word: None

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

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

AccuStandard

ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

ISO Guide 34 Reference Material

Product Number: ICC-013
Lot Number: CP-0860

S 36748

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.

ANAB ACCREDITED ACCREDITATION REFERENCE MATERIAL PRODUCER

ANAB ACCREDITED ACCREDITATION TESTING LABORATORY

ISO 9001 Registered Quality System – TUV USA

250 SMITH STREET • NORTH KINGSTOWN, RHODE ISLAND 02852 • WWW.ULTRASCI.COM

ULTRA SCIENTIFIC
Analytical Solutions

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

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

ANAB ACCREDITED ISO/IEC 17025 TESTING LABORATORY

ISO 9001 Registered Quality System – TUV USA

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Cambridge Isotope Laboratories, Inc.

Certificate of Analysis

S 47863

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: ≥98%

MW*: 130.44
** For isotopically labeled compounds, MW listed is for the fully enriched product.*

$NaCl^{18}O_4$

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 ± 1.0 µg/mL (k=2)
Chemical Purity of Neat Material(s)	98%
LC/MS for Concentration	105.4 ± 1.1 µg/mL (k=2)

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

00969362

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
*	695962 CCV@25	Vial 71	1	Control	1	1.92768e6	7.930	24.86639
*	695963 LCS@3.	Vial 72	1	Control	2	2.01219e5	7.529	2.99456
*	695964 ICS@3.0	Vial 73	1	Control	3	1.44924e5	7.156	2.76338
*	695966 LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
*	2004545001 100	Vial 75	1	Sample	5	9.91954e6	7.281	1.06828e4
*	2004546001	Vial 76	1	Sample	6	0.00000	0.000	0.00000
*	2004547001	Vial 77	1	Sample	7	0.00000	0.000	0.00000
*	2004548001	Vial 78	1	Sample	8	0.00000	0.000	0.00000
*	2004548002	Vial 79	1	Sample	9	0.00000	0.000	0.00000
*	2004548003	Vial 80	1	Sample	10	0.00000	0.000	0.00000
*	2004548004	Vial 81	1	Sample	11	0.00000	0.000	0.00000
*	2004548005	Vial 82	1	Sample	12	0.00000	0.000	0.00000
*	2004548006	Vial 83	1	Sample	13	0.00000	0.000	0.00000
*	2004548007	Vial 84	1	Sample	14	0.00000	0.000	0.00000
*	695967 CCV@25	Vial 71	1	Control	15	1.72959e6	7.246	25.26416
*	2004548008	Vial 85	1	Sample	16	7.48879e5	7.008	18.97843
*	2004548009	Vial 86	1	Sample	17	0.00000	0.000	0.00000
*	2004548010	Vial 87	1	Sample	18	0.00000	0.000	0.00000
*	2004548011	Vial 88	1	Sample	19	0.00000	0.000	0.00000
*	2004548012	Vial 89	1	Sample	20	4.27720e6	6.875	94.65050
*	2004548013	Vial 90	1	Sample	21	1.18569e6	6.905	17.51257
*	2004548014	Vial 91	1	Sample	22	1.20862e6	6.879	21.88966
*	2004548015 MS	Vial 92	1	Sample	23	2.05915e5	6.973	3.19687
*	2004548016 MSD	Vial 93	1	Sample	24	1.99352e5	7.026	3.13852
*	2004545001 1K	Vial 94	1	Sample	25	6.98274e5	7.287	1.06347e4
*	695968 CCV@25	Vial 71	1	Control	26	1.54321e6	7.193	25.75234
*	2004548008 RE	Vial 85	1	Sample	27	6.97532e5	6.972	18.60668
*	2004548012 10X	Vial 95	1	Sample	28	5.64190e5	7.108	86.45192
*	2004548008 5X	Vial 96	1	Sample	29	2.64237e5	7.093	17.29449
*	696082 CCV@25	Vial 71	1	Control	30	1.61866e6	7.208	26.26917

TB 2.18.20

N.R. – NOT REPORTED (RERUN + DILUTION) TB 2.18.20

#	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
*	695962 CCV@25	Vial 71	1	Control	1	2.65029e5	7.950	5.00000
*	695963 LCS@3.	Vial 72	1	Control	2	2.47234e5	7.555	5.00000
*	695964 ICS@3.0	Vial 73	1	Control	3	1.92731e5	7.177	5.00000
*	695966 LMB	Vial 74	1	Control	4	2.29809e5	7.346	5.00000
*	2004545001 100	Vial 75	1	Sample	5	2.35908e5	7.306	500.00000
*	2004546001	Vial 76	1	Sample	6	2.19401e5	7.052	5.00000
*	2004547001	Vial 77	1	Sample	7	2.15048e5	7.060	5.00000
*	2004548001	Vial 78	1	Sample	8	2.54205e5	7.021	5.00000
*	2004548002	Vial 79	1	Sample	9	1.96395e5	6.630	5.00000
*	2004548003	Vial 80	1	Sample	10	2.66482e5	7.157	5.00000
*	2004548004	Vial 81	1	Sample	11	2.45154e5	7.031	5.00000
*	2004548005	Vial 82	1	Sample	12	2.58211e5	6.986	5.00000
*	2004548006	Vial 83	1	Sample	13	2.44279e5	6.981	5.00000
*	2004548007	Vial 84	1	Sample	14	2.65820e5	7.133	5.00000
*	695967 CCV@25	Vial 71	1	Control	15	2.33668e5	7.257	5.00000
*	2004548008	Vial 85	1	Sample	16	1.38230e5	7.032	5.00000
*	2004548009	Vial 86	1	Sample	17	2.27262e5	6.903	5.00000
*	2004548010	Vial 87	1	Sample	18	2.50415e5	6.920	5.00000
*	2004548011	Vial 88	1	Sample	19	2.67412e5	6.947	5.00000
*	2004548012	Vial 89	1	Sample	20	1.19387e5	6.898	5.00000
*	2004548013	Vial 90	1	Sample	21	2.38618e5	6.920	5.00000
*	2004548014	Vial 91	1	Sample	22	1.91102e5	6.901	5.00000
*	2004548015 MS	Vial 92	1	Sample	23	2.37178e5	7.001	5.00000

#*	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
*	2004548016 MSD	Vial 93	1	Sample	24	2.33840e5	7.035	5.00000
*	2004545001 1K	Vial 94	1	Sample	25	2.37891e5	7.310	5000.00000
*	695968 CCV@25	Vial 71	1	Control	26	2.04125e5	7.215	5.00000
*	2004548008 RE	Vial 85	1	Sample	27	1.31527e5	6.998	5.00000
*	2004548012 10X	Vial 95	1	Sample	28	2.38166e5	7.128	50.00000
*	2004548008 5X	Vial 96	1	Sample	29	2.81500e5	7.121	25.00000
*	696082 CCV@25	Vial 71	1	Control	30	2.09447e5	7.223	5.00000

#*	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
*	695962 CCV@25	Vial 71	1	Control	1	5.76713e5	7.946	24.43478
*	695963 LCS@3.	Vial 72	1	Control	2	6.49552e4	7.544	3.08073
*	695964 ICS@3.0	Vial 73	1	Control	3	4.99792e4	7.163	3.03921
*	695966 LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
*	2004545001 100	Vial 75	1	Sample	5	2.92982e6	7.295	1.05759e4
*	2004546001	Vial 76	1	Sample	6	0.00000	0.000	0.00000
*	2004547001	Vial 77	1	Sample	7	0.00000	0.000	0.00000
*	2004548001	Vial 78	1	Sample	8	0.00000	0.000	0.00000
*	2004548002	Vial 79	1	Sample	9	0.00000	0.000	0.00000
*	2004548003	Vial 80	1	Sample	10	0.00000	0.000	0.00000
*	2004548004	Vial 81	1	Sample	11	0.00000	0.000	0.00000
*	2004548005	Vial 82	1	Sample	12	0.00000	0.000	0.00000
*	2004548006	Vial 83	1	Sample	13	0.00000	0.000	0.00000
*	2004548007	Vial 84	1	Sample	14	0.00000	0.000	0.00000
*	695967 CCV@25	Vial 71	1	Control	15	5.12273e5	7.259	24.60220
*	2004548008	Vial 85	1	Sample	16	2.46751e5	7.031	20.35009
*	2004548009	Vial 86	1	Sample	17	0.00000	0.000	0.00000
*	2004548010	Vial 87	1	Sample	18	0.00000	0.000	0.00000
*	2004548011	Vial 88	1	Sample	19	0.00000	0.000	0.00000
*	2004548012	Vial 89	1	Sample	20	1.38274e6	6.890	100.27945
*	2004548013	Vial 90	1	Sample	21	3.97137e5	6.920	19.06294
*	2004548014	Vial 91	1	Sample	22	4.02089e5	6.893	23.69193
*	2004548015 MS	Vial 92	1	Sample	23	7.45778e4	6.989	3.70934
*	2004548016 MSD	Vial 93	1	Sample	24	7.01320e4	7.029	3.53314
*	2004545001 1K	Vial 94	1	Sample	25	2.11343e5	7.302	1.04716e4
*	695968 CCV@25	Vial 71	1	Control	26	4.53507e5	7.209	24.90409
*	2004548008 RE	Vial 85	1	Sample	27	2.26847e5	6.989	19.70833
*	2004548012 10X	Vial 95	1	Sample	28	1.80717e5	7.130	89.77314
*	2004548008 5X	Vial 96	1	Sample	29	8.81854e4	7.119	18.47589
*	696082 CCV@25	Vial 71	1	Control	30	4.74563e5	7.222	25.35553

*** End of Report ***

Sequence Table:

Method and Injection Info Part:

Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
1	Vial 71	695962 CCV@25	CLO4-AQN	1	Ctrl Samp		
2	Vial 72	695963 LCS@3.	CLO4-AQN	1	Ctrl Samp		
3	Vial 73	695964 ICS@3.0	CLO4-AQN	1	Ctrl Samp		
4	Vial 74	695966 LMB	CLO4-AQN	1	Ctrl Samp		
5	Vial 75	2004545001 100	CLO4-AQN	1	Sample		
6	Vial 76	2004546001	CLO4-AQN	1	Sample		
7	Vial 77	2004547001	CLO4-AQN	1	Sample		
8	Vial 78	2004548001	CLO4-AQN	1	Sample		
9	Vial 79	2004548002	CLO4-AQN	1	Sample		
10	Vial 80	2004548003	CLO4-AQN	1	Sample		
11	Vial 81	2004548004	CLO4-AQN	1	Sample		
12	Vial 82	2004548005	CLO4-AQN	1	Sample		
13	Vial 83	2004548006	CLO4-AQN	1	Sample		
14	Vial 84	2004548007	CLO4-AQN	1	Sample		
15	Vial 71	695967 CCV@25	CLO4-AQN	1	Ctrl Samp		
16	Vial 85	2004548008	CLO4-AQN	1	Sample		
17	Vial 86	2004548009	CLO4-AQN	1	Sample		
18	Vial 87	2004548010	CLO4-AQN	1	Sample		
19	Vial 88	2004548011	CLO4-AQN	1	Sample		
20	Vial 89	2004548012	CLO4-AQN	1	Sample		
21	Vial 90	2004548013	CLO4-AQN	1	Sample		
22	Vial 91	2004548014	CLO4-AQN	1	Sample		
23	Vial 92	2004548015 MS	CLO4-AQN	1	Sample		
24	Vial 93	2004548016 MSD	CLO4-AQN	1	Sample		
25	Vial 94	2004545001 1K	CLO4-AQN	1	Sample		
26	Vial 71	695968 CCV@25	CLO4-AQN	1	Ctrl Samp		
27	Vial 85	2004548008 RE	CLO4-AQN	1	Sample		
28	Vial 95	2004548012 10X	CLO4-AQN	1	Sample		
29	Vial 96	2004548008 5X	CLO4-AQN	1	Sample		
30	Vial 71	696082 CCV@25	CLO4-AQN	1	Ctrl Samp		

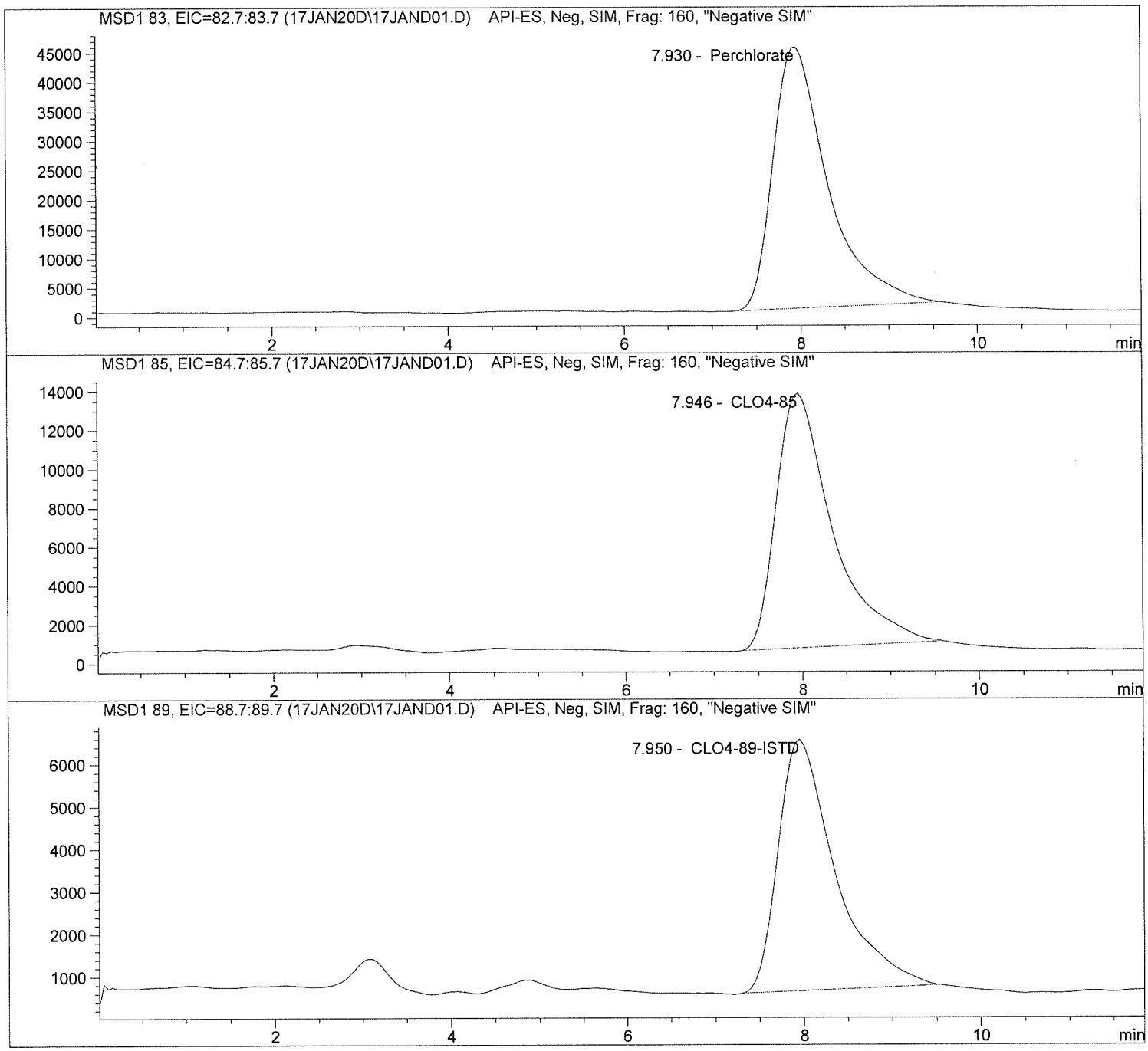
TB 2.18.20

Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND01.D Sample Name: 695962 CCV@25

Injection Date:	2/17/2020 08:48:29	Seq Line:	1
Sample Name:	695962 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: 2/17/2020 15:42:52

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND01.D Sample Name: 695962 CCV@25

Injection Date:	2/17/2020 08:48:29	Seq Line:	1
Sample Name:	695962 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: 2/17/2020 15:42:52

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
7.930	PBA	1927676.2	24.8664	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.946	PBA	576713.4	24.4348	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.950	PBA	265029.5	5.0000	CLO4-89-ISTD

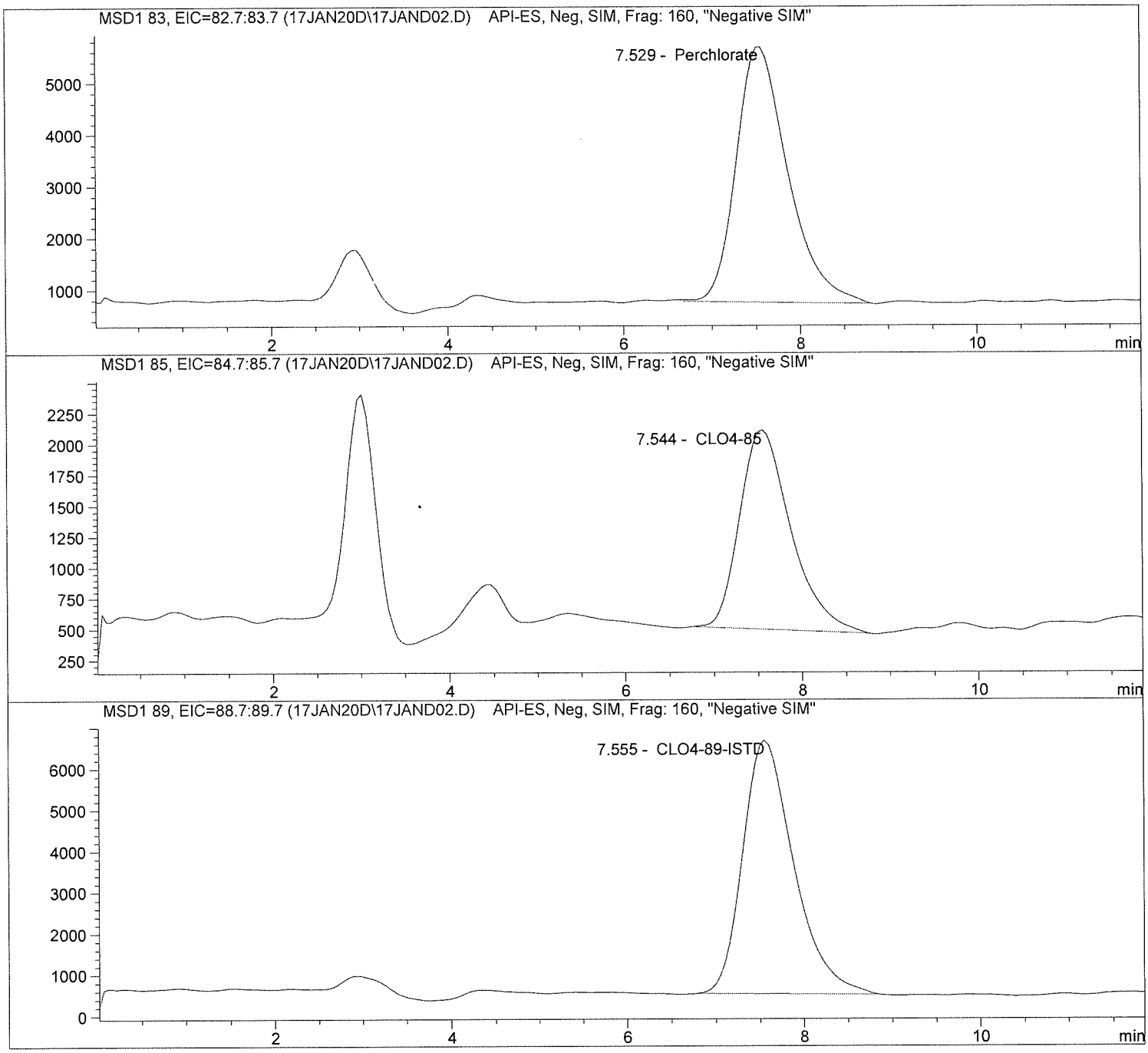
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND02.D Sample Name: 695963 LCS@3.

Injection Date:	2/17/2020 09:02:20	Seq Line:	2
Sample Name:	695963 LCS@3.	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: 2/17/2020 15:42:52

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND02.D Sample Name: 695963 LCS@3.

Injection Date:	2/17/2020 09:02:20	Seq Line:	2
Sample Name:	695963 LCS@3.	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: 2/17/2020 15:42:52

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
7.529	BBA	201219.2	2.9946	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.544	PBA	64955.2	3.0807	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.555	BBA	247234.1	5.0000	CLO4-89-ISTD

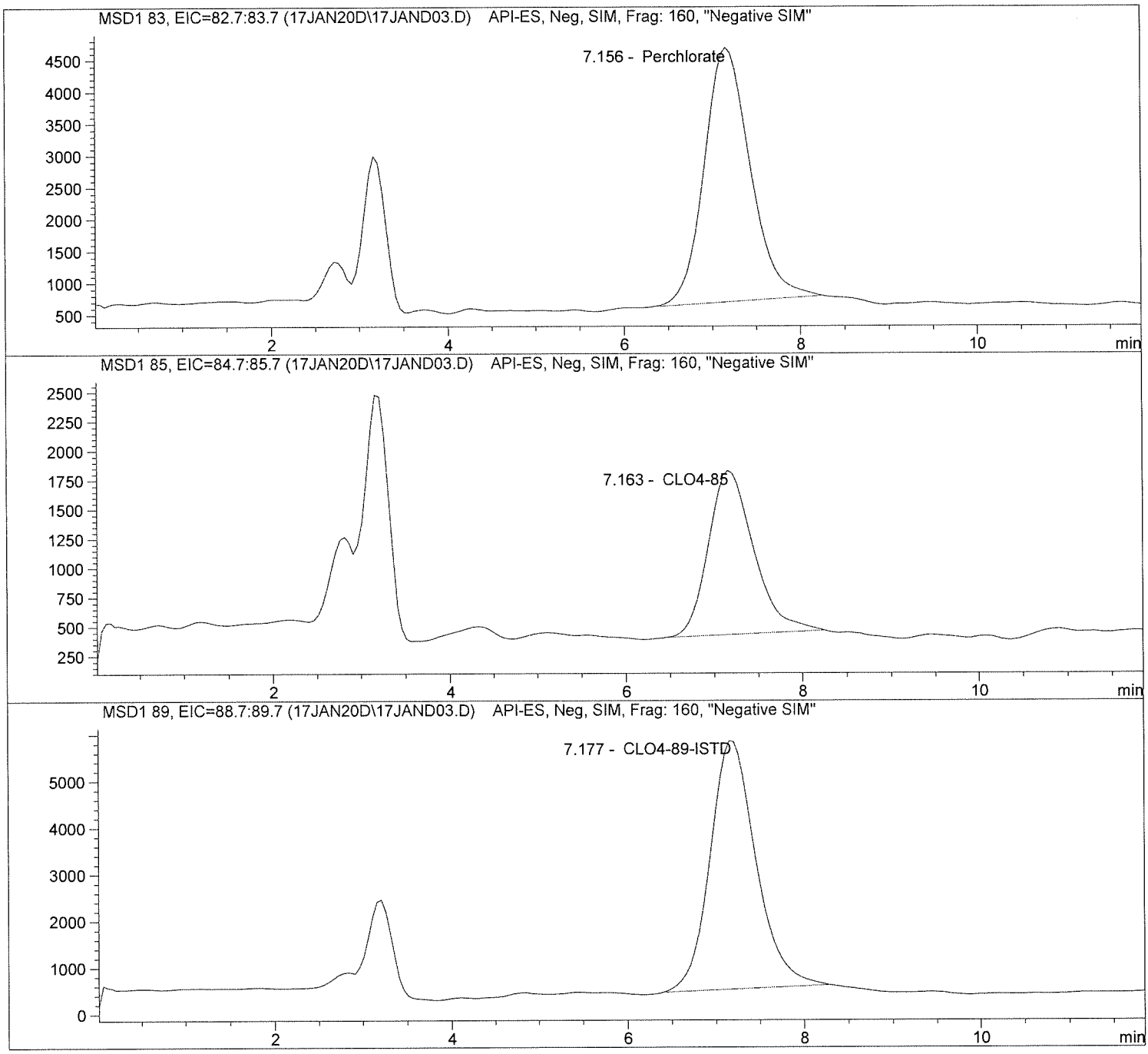
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND03.D Sample Name: 695964 ICS@3.0

Injection Date:	2/17/2020 09:16:11	Seq Line:	3
Sample Name:	695964 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: 2/17/2020 15:42:52

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND03.D Sample Name: 695964 ICS@3.0

Injection Date:	2/17/2020 09:16:11	Seq Line:	3
Sample Name:	695964 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: 2/17/2020 15:42:52

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
7.156	BBA	144924.0	2.7634	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.163	PBA	49979.2	3.0392	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.177	PBA	192730.7	5.0000	CLO4-89-ISTD

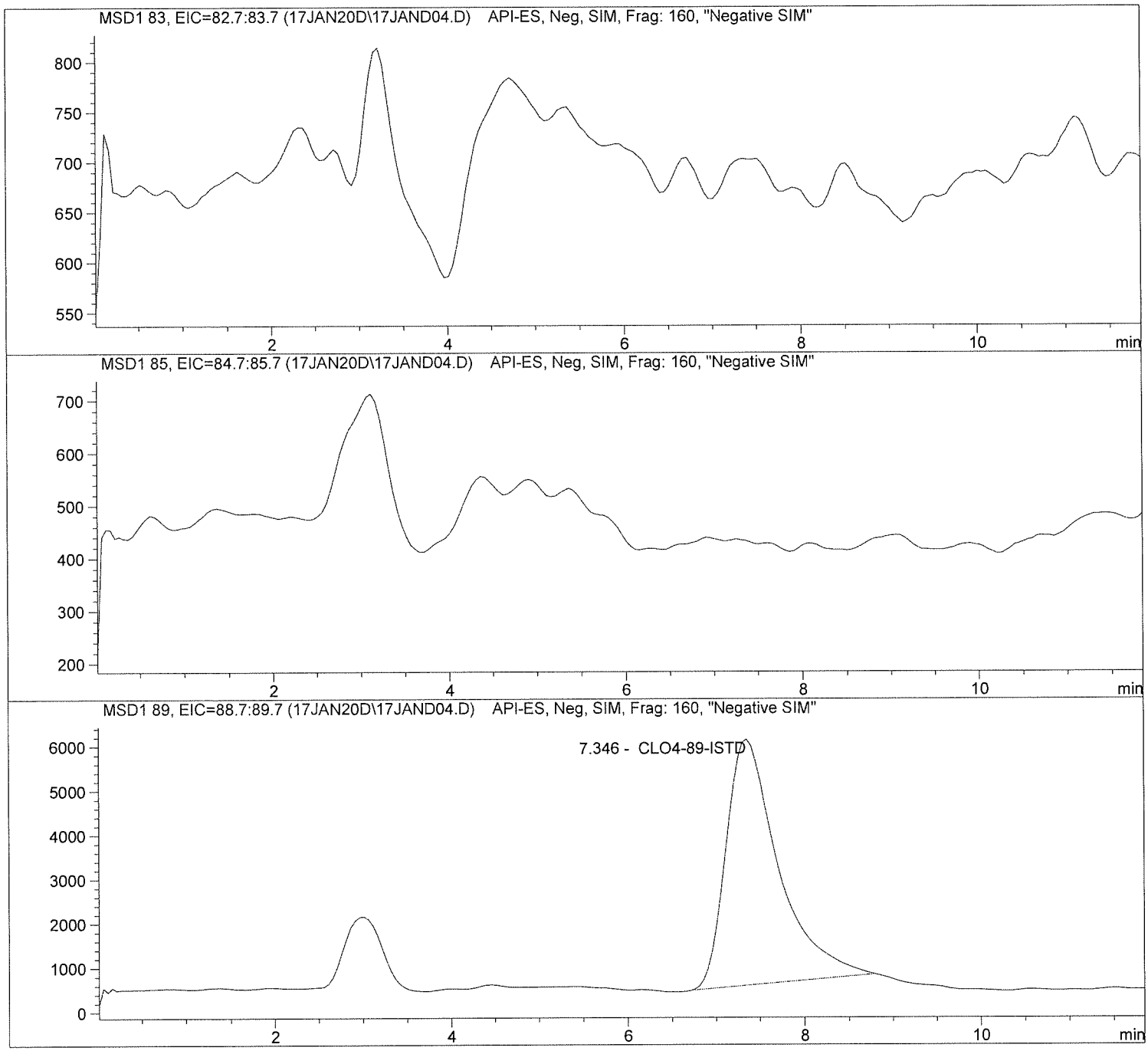
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND04.D Sample Name: 695966 LMB

Injection Date:	2/17/2020 09:30:08	Seq Line:	4
Sample Name:	695966 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: 2/17/2020 15:42:52

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND04.D Sample Name: 695966 LMB

Injection Date:	2/17/2020 09:30:08	Seq Line:	4
Sample Name:	695966 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: 2/17/2020 15:42:52

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
7.346	PBA	229809.2	5.0000	CLO4-89-ISTD

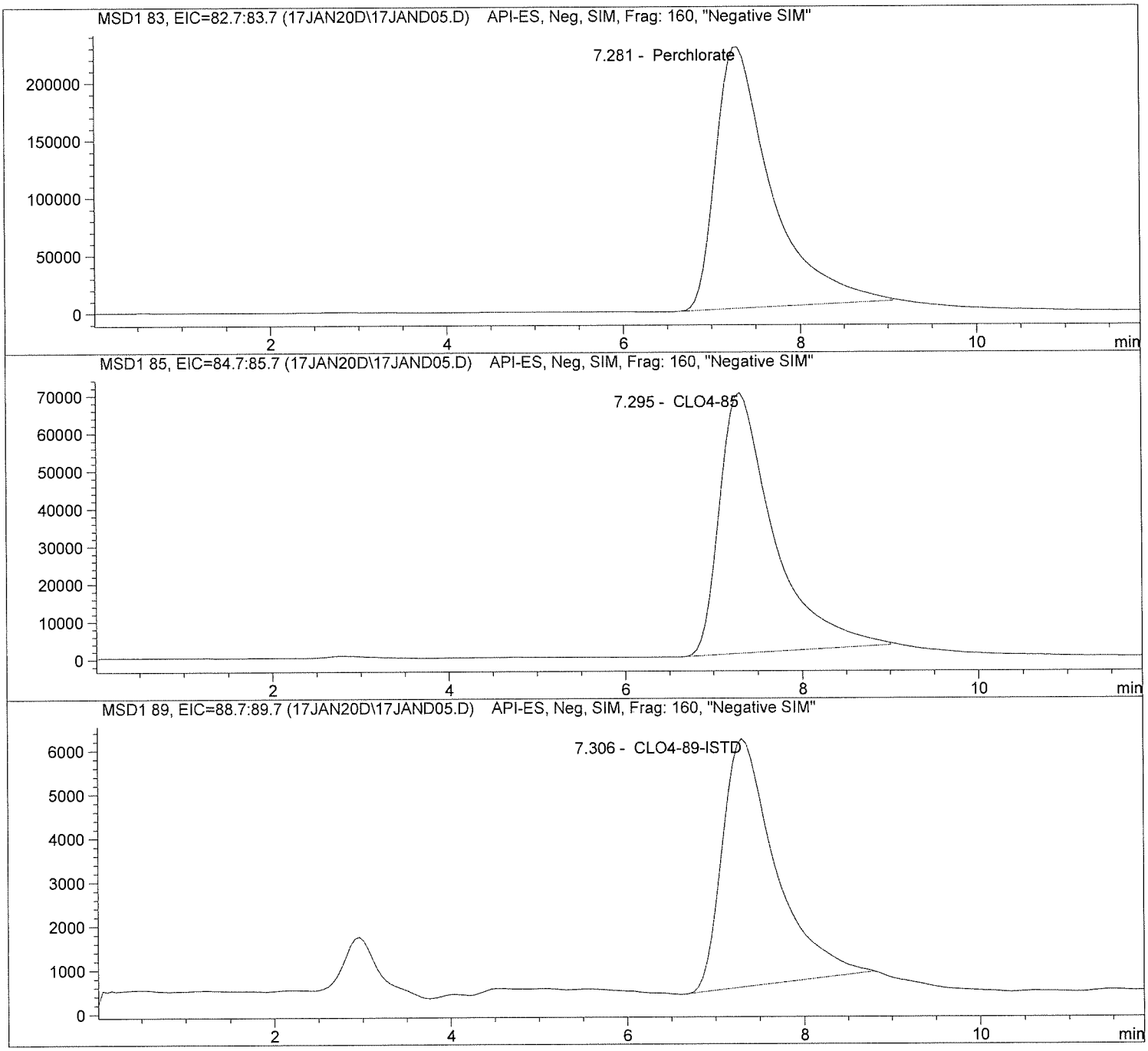
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND05.D Sample Name: 2004545001 100

Injection Date:	2/17/2020 09:44:01	Seq Line:	5
Sample Name:	2004545001 100	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: 2/17/2020 15:42:52

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND05.D Sample Name: 2004545001 100

Injection Date:	2/17/2020 09:44:01	Seq Line:	5
Sample Name:	2004545001 100	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:	2/17/2020 15:42:52

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
7.281	PBA	9919537.0	10682.7974	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.295	PBA	2929815.8	10575.9042	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.306	PBA	235908.1	500.0000	CLO4-89-ISTD

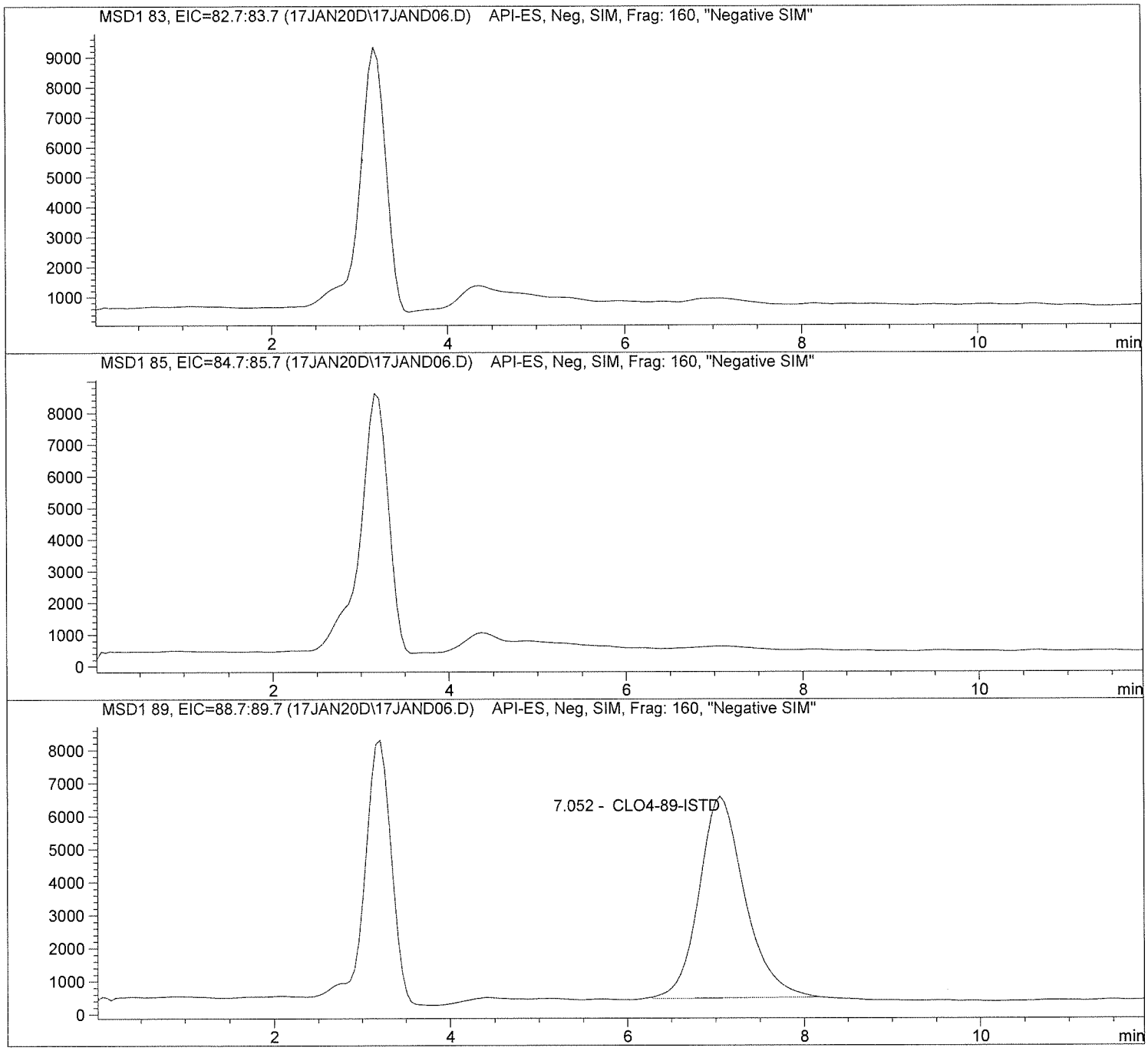
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND06.D Sample Name: 2004546001

Injection Date:	2/17/2020 09:57:56	Seq Line:	6
Sample Name:	2004546001	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: 2/17/2020 15:42:52

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND06.D Sample Name: 2004546001

Injection Date:	2/17/2020 09:57:56	Seq Line:	6
Sample Name:	2004546001	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: 2/17/2020 15:42:52

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
7.052	BBA	219400.8	5.0000	CLO4-89-ISTD

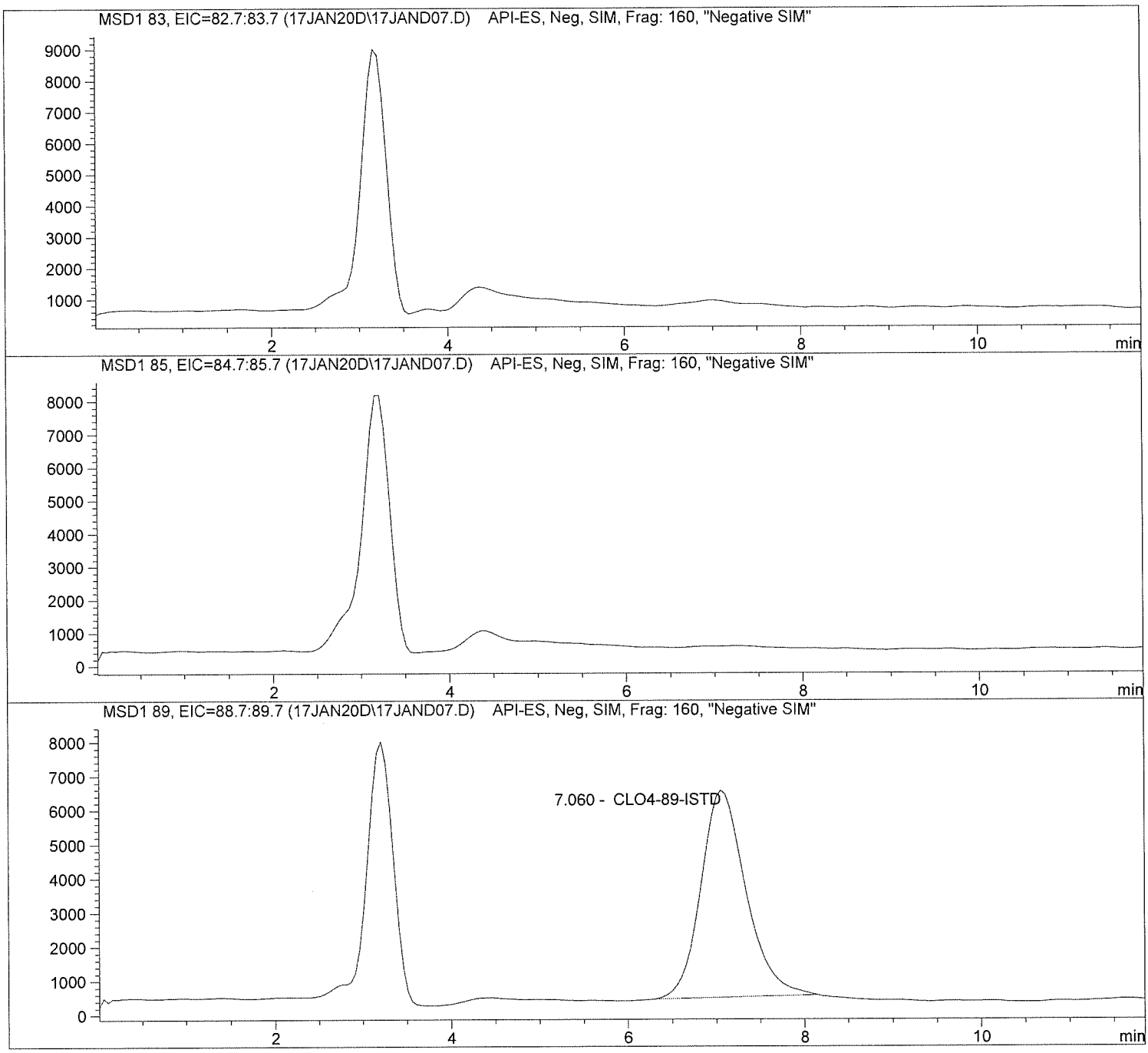
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND07.D Sample Name: 2004547001

Injection Date:	2/17/2020 10:11:50	Seq Line:	7
Sample Name:	2004547001	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: 2/17/2020 15:42:52

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND07.D Sample Name: 2004547001

Injection Date:	2/17/2020 10:11:50	Seq Line:	7
Sample Name:	2004547001	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: 2/17/2020 15:42:52

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	215048.0	5.0000	CLO4-89-ISTD

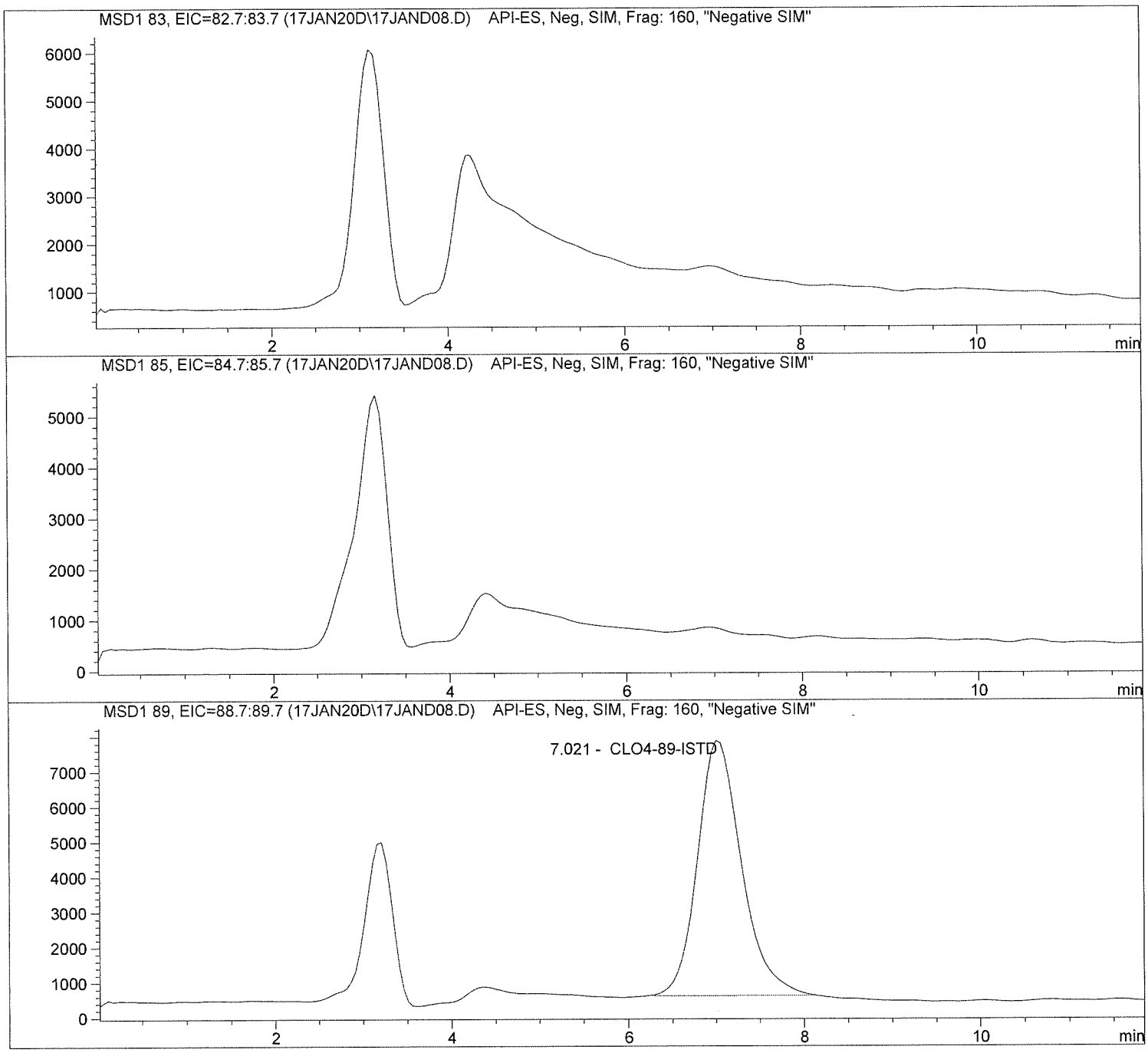
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND08.D Sample Name: 2004548001

Injection Date:	2/17/2020 10:25:44	Seq Line:	8
Sample Name:	2004548001	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: 2/17/2020 15:42:52

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND08.D Sample Name: 2004548001

Injection Date:	2/17/2020 10:25:44	Seq Line:	8
Sample Name:	2004548001	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: 2/17/2020 15:42:52

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: MSDl 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
7.021	BBA	254205.5	5.0000	CLO4-89-ISTD

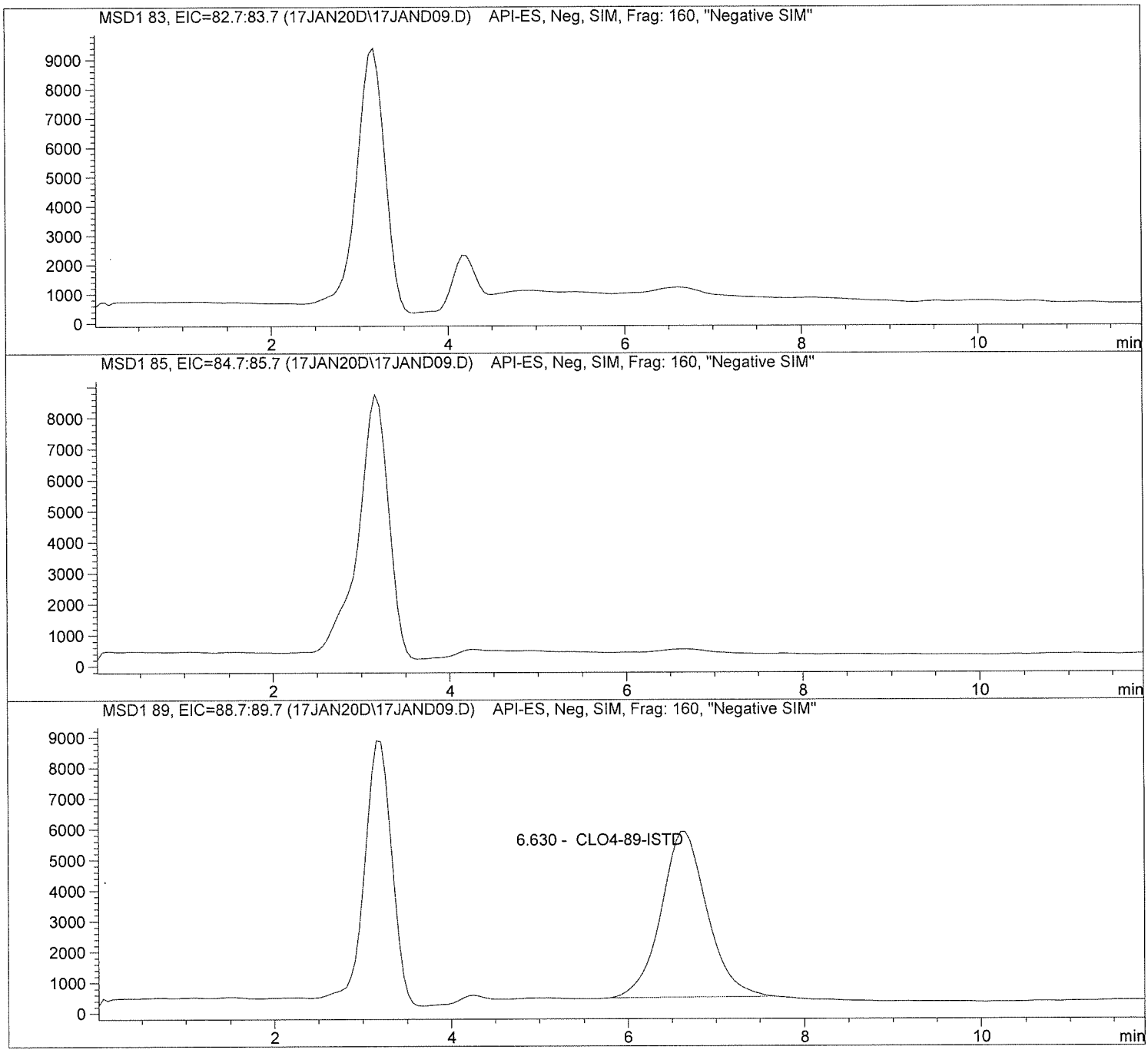
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND09.D Sample Name: 2004548002

Injection Date:	2/17/2020 10:39:36	Seq Line:	9
Sample Name:	2004548002	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: 2/17/2020 15:42:52

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND09.D Sample Name: 2004548002

Injection Date:	2/17/2020 10:39:36	Seq Line:	9
Sample Name:	2004548002	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: 2/17/2020 15:42:52

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
6.630	PBA	196394.8	5.0000	CLO4-89-ISTD

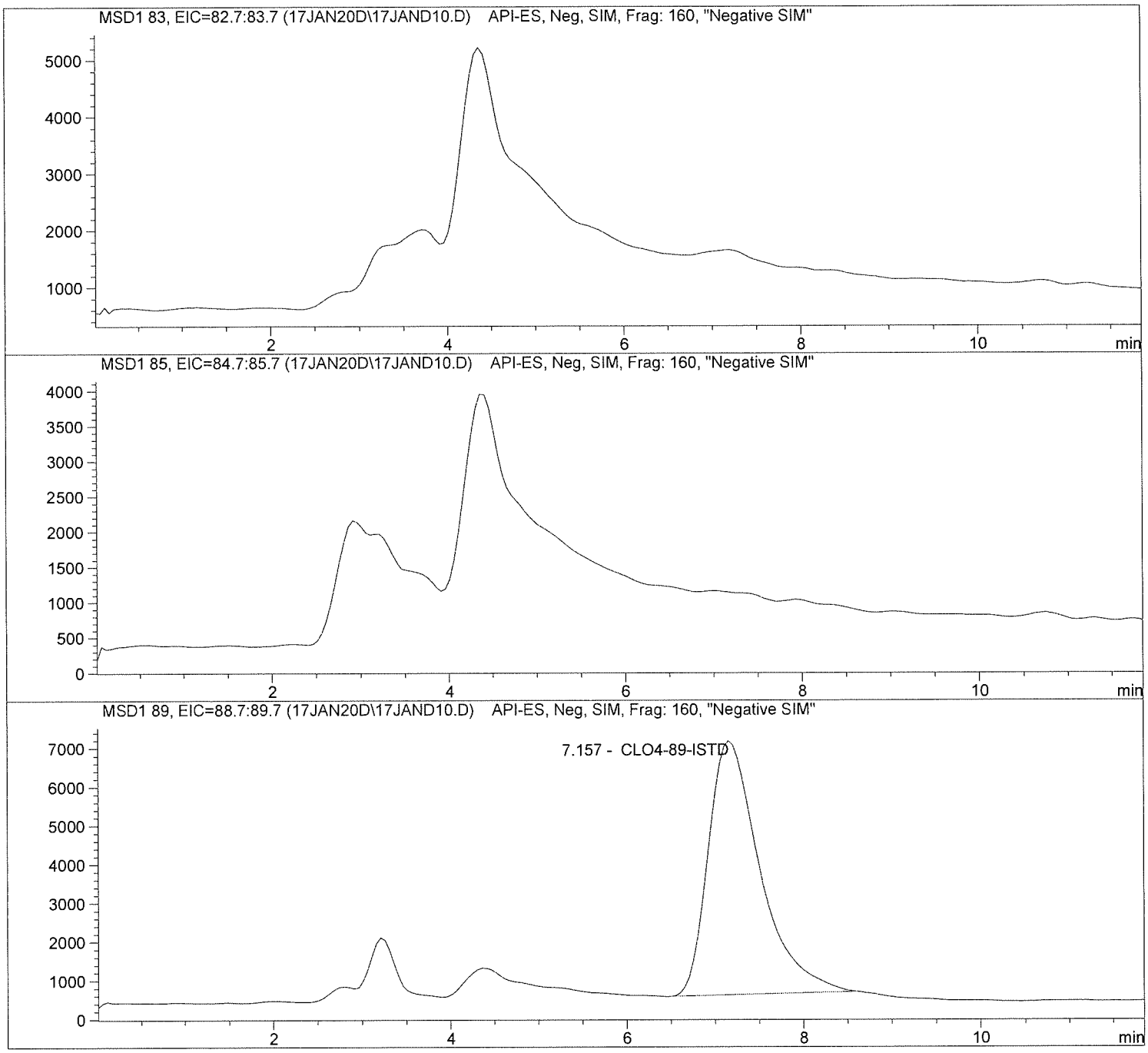
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND10.D Sample Name: 2004548003

Injection Date:	2/17/2020 10:53:30	Seq Line:	10
Sample Name:	2004548003	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: 2/17/2020 15:42:52

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND10.D Sample Name: 2004548003

Injection Date:	2/17/2020 10:53:30	Seq Line:	10
Sample Name:	2004548003	Location:	Via1 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: 2/17/2020 15:42:52

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
7.157	PBA	266482.4	5.0000	CLO4-89-ISTD

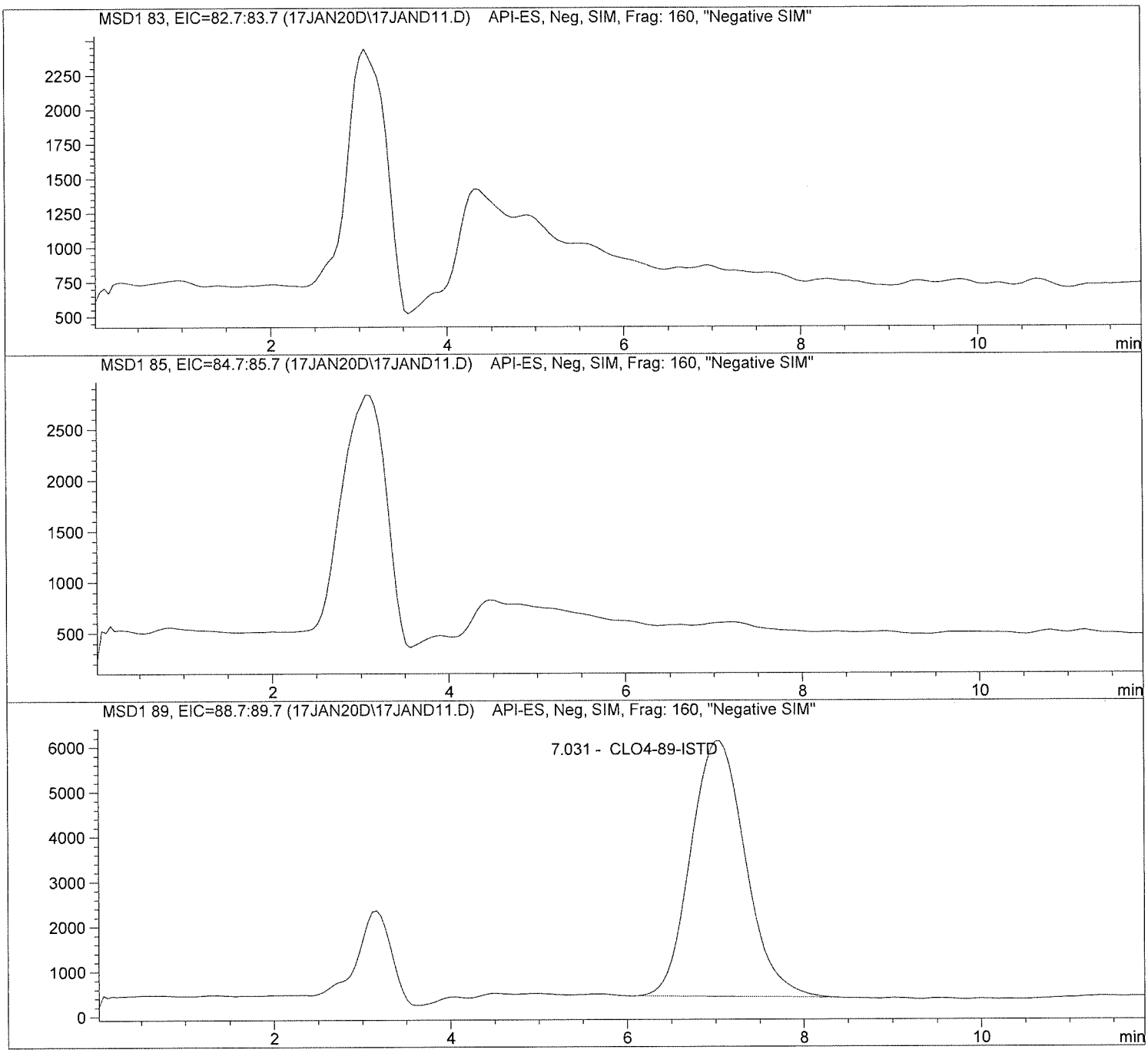
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND11.D Sample Name: 2004548004

Injection Date:	2/17/2020 11:07:22	Seq Line:	11
Sample Name:	2004548004	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: 2/17/2020 15:42:52

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND11.D Sample Name: 2004548004

Injection Date:	2/17/2020 11:07:22	Seq Line:	11
Sample Name:	2004548004	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: 2/17/2020 15:42:52

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
7.031	PBA	245153.6	5.0000	CLO4-89-ISTD

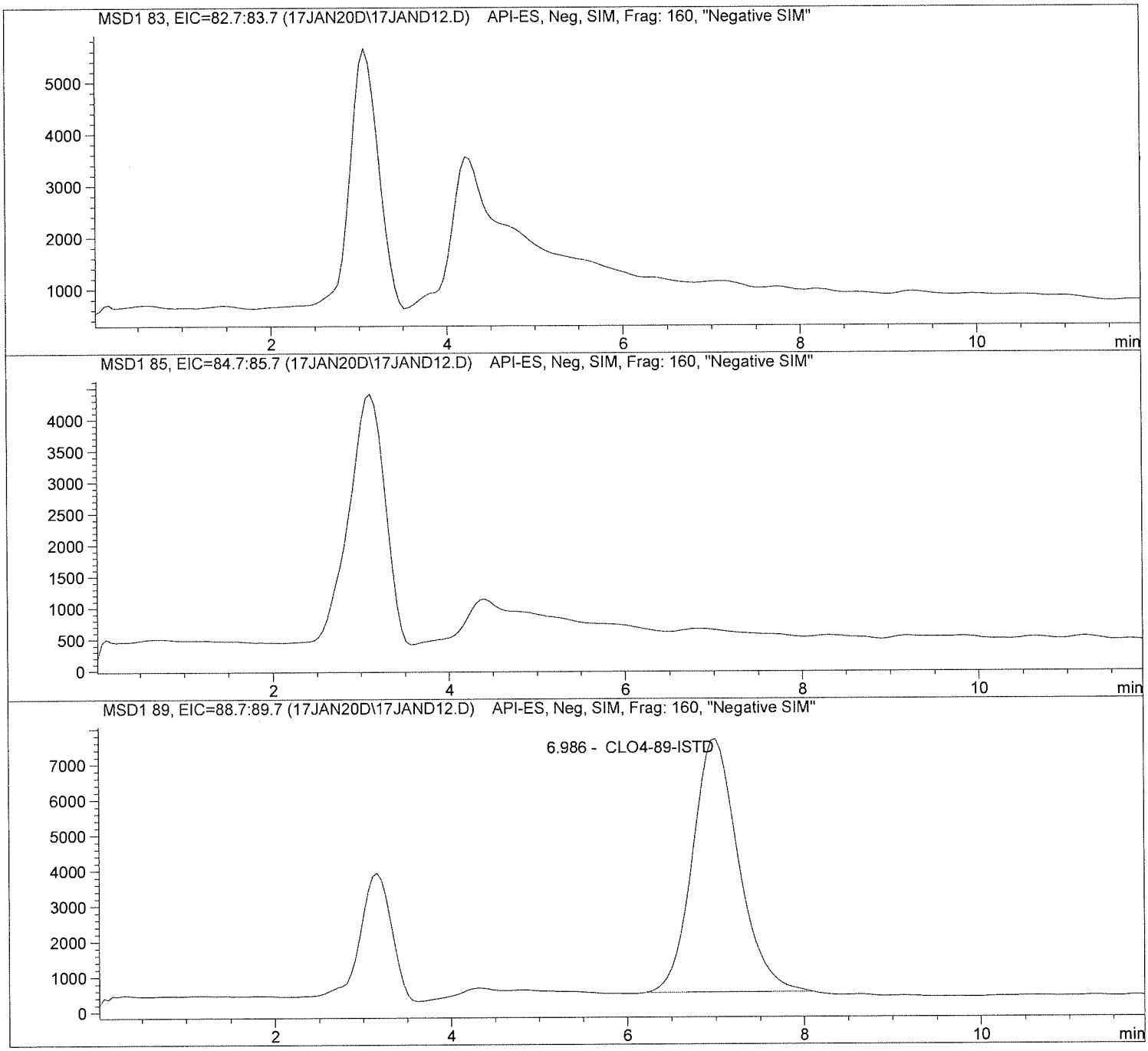
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND12.D Sample Name: 2004548005

Injection Date:	2/17/2020 11:21:13	Seq Line:	12
Sample Name:	2004548005	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: 2/17/2020 15:42:52

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND12.D Sample Name: 2004548005

Injection Date:	2/17/2020 11:21:13	Seq Line:	12
Sample Name:	2004548005	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: 2/17/2020 15:42:52

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
6.986	PBA	258211.1	5.0000	CLO4-89-ISTD

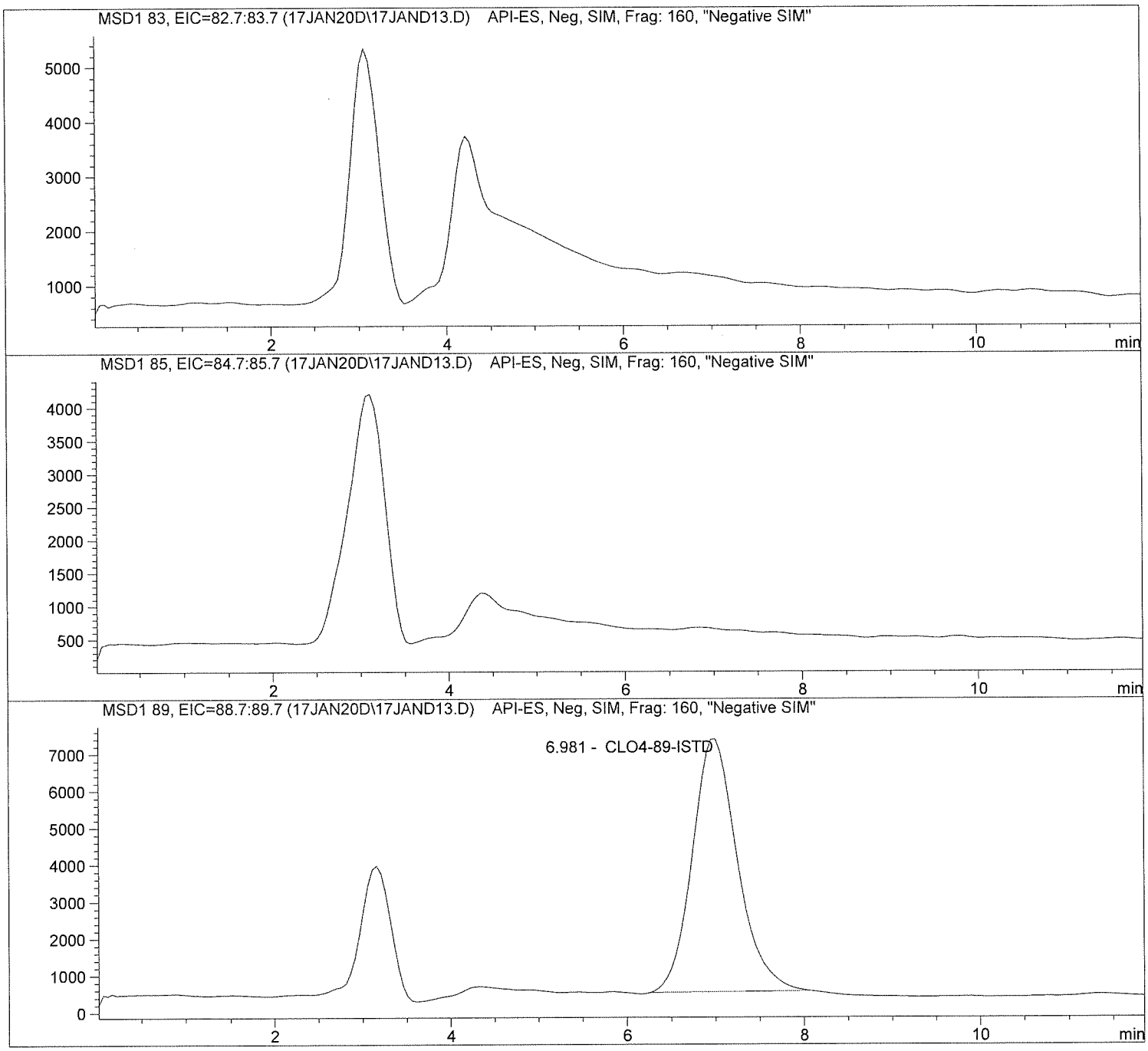
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND13.D Sample Name: 2004548006

Injection Date:	2/17/2020 11:35:03	Seq Line:	13
Sample Name:	2004548006	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: 2/17/2020 15:42:52

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND13.D Sample Name: 2004548006

Injection Date:	2/17/2020 11:35:03	Seq Line:	13
Sample Name:	2004548006	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: 2/17/2020 15:42:52

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
6.981	PBA	244278.8	5.0000	CLO4-89-ISTD

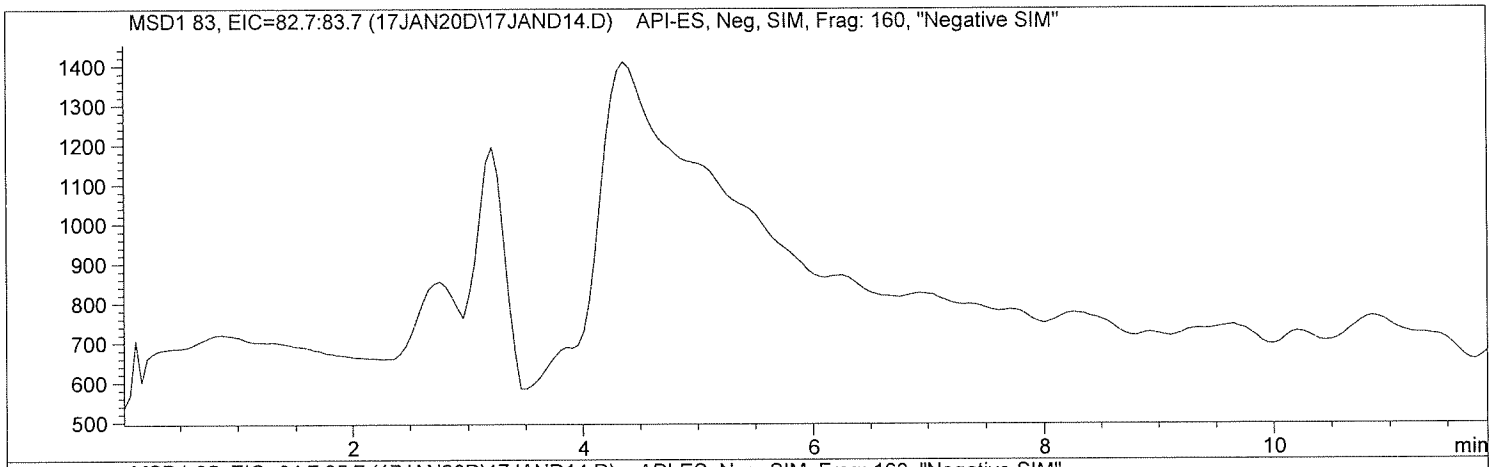
*** End of Report ***

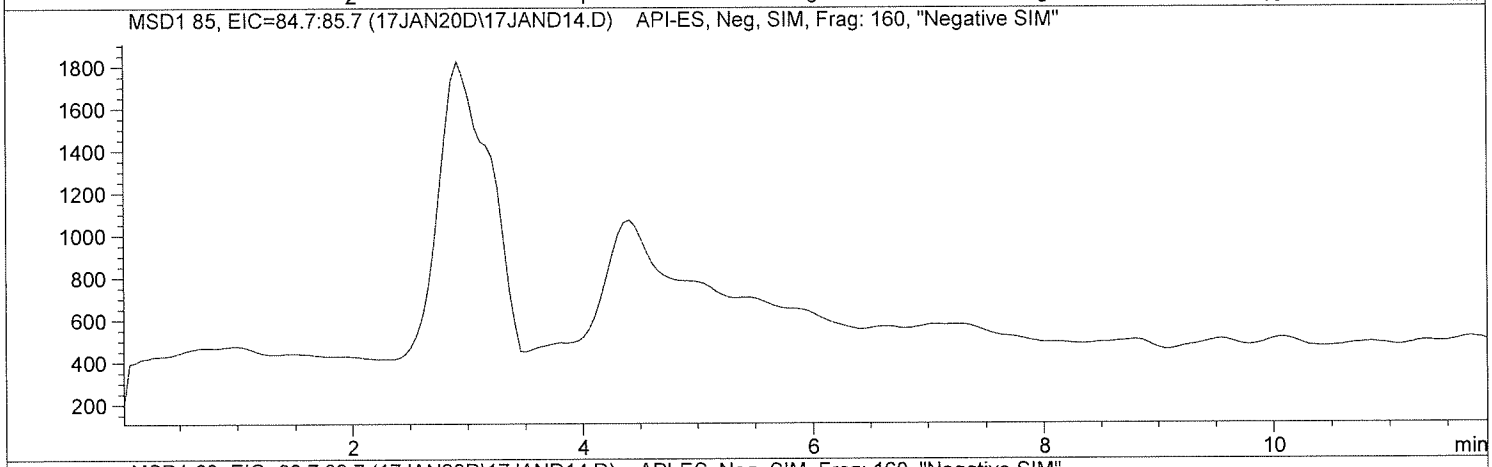
Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND14.D Sample Name: 2004548007

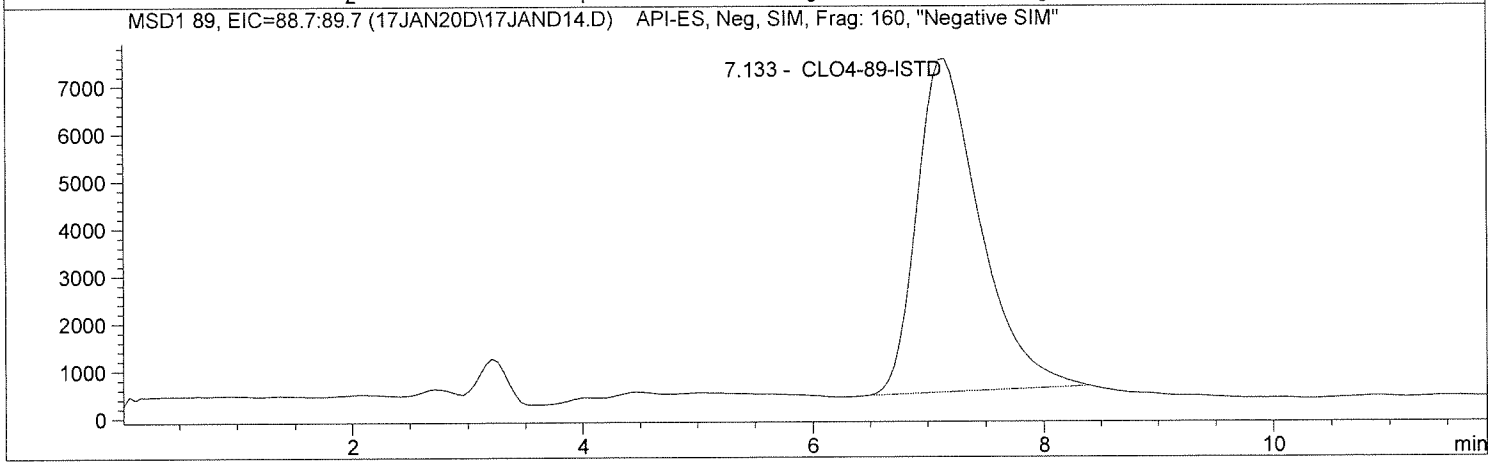
Injection Date:	2/17/2020 11:49:00	Seq Line:	14
Sample Name:	2004548007	Location:	Vial 84
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 2/17/2020 15:42:52

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND14.D Sample Name: 2004548007

Injection Date:	2/17/2020 11:49:00	Seq Line:	14
Sample Name:	2004548007	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: 2/17/2020 15:42:52

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
7.133	PBA	265819.8	5.0000	CLO4-89-ISTD

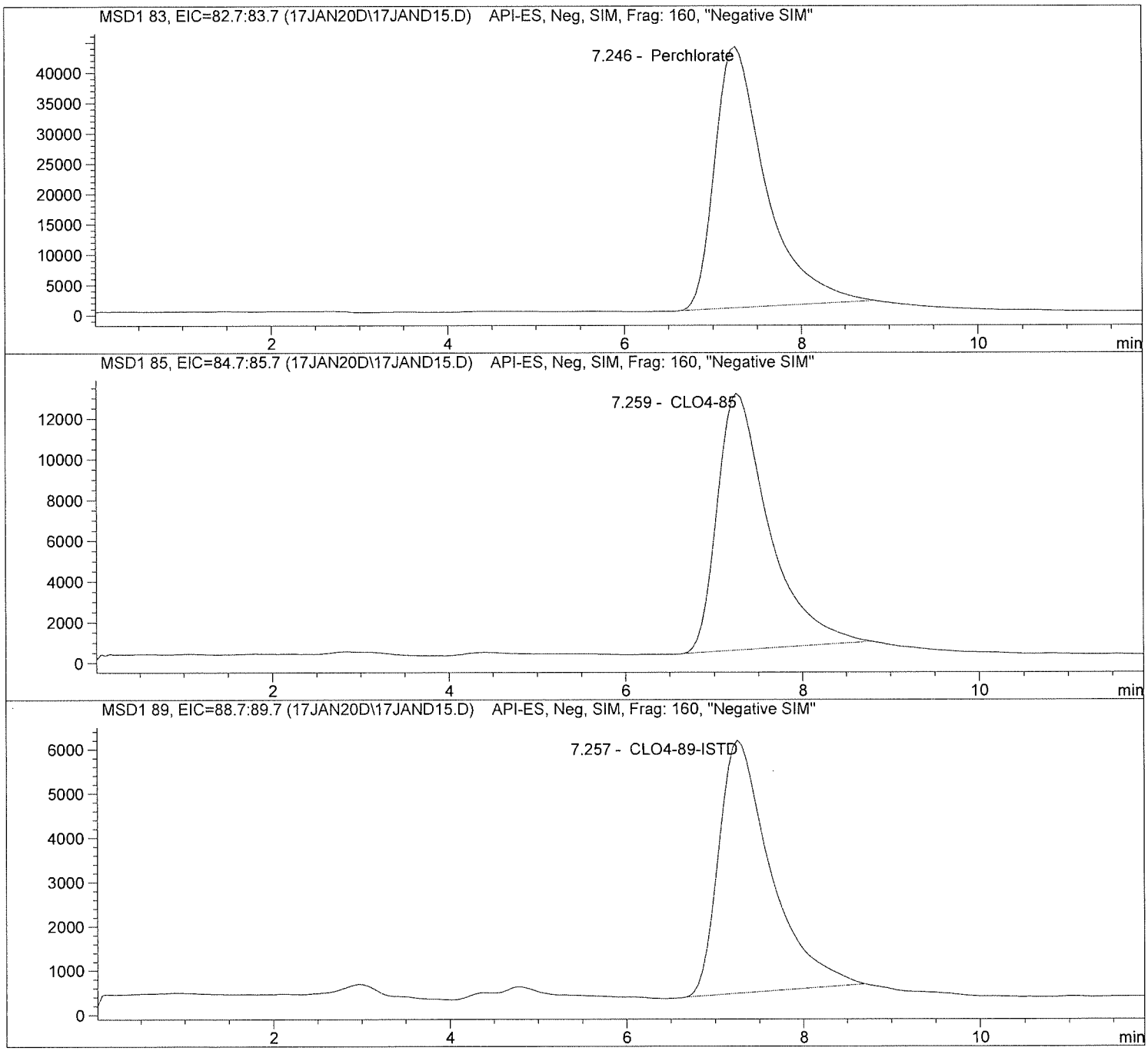
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND15.D Sample Name: 695967 CCV@25

Injection Date:	2/17/2020 12:02:52	Seq Line:	15
Sample Name:	695967 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: 2/17/2020 15:42:52

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND15.D Sample Name: 695967 CCV@25

Injection Date:	2/17/2020 12:02:52	Seq Line:	15
Sample Name:	695967 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: 2/17/2020 15:42:52

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
7.246	PBA	1729590.0	25.2642	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.259	PBA	512272.7	24.6022	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.257	PBA	233667.8	5.0000	CLO4-89-ISTD

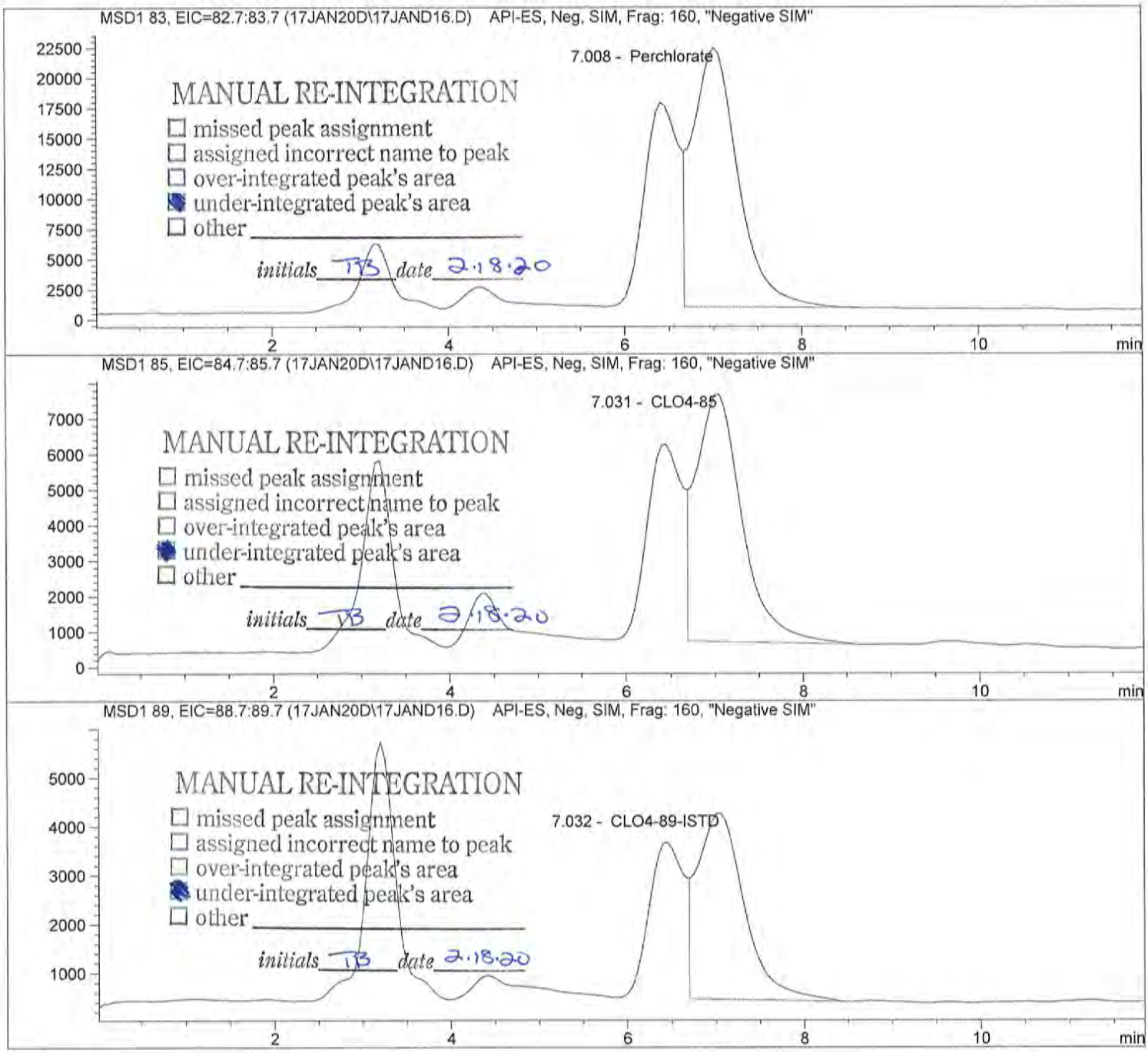
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND16.D Sample Name: 2004548008

Injection Date:	2/17/2020 12:16:47	Seq Line:	16
Sample Name:	2004548008	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: 2/17/2020 15:42:52

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND16.D Sample Name: 2004548008

Injection Date:	2/17/2020 12:16:47	Seq Line:	16
Sample Name:	2004548008	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: 2/17/2020 15:42:52

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
7.008	FM	748879.1	18.9784	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.031	FM	246750.5	20.3501	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.032	FM	138229.9	5.0000	CLO4-89-ISTD

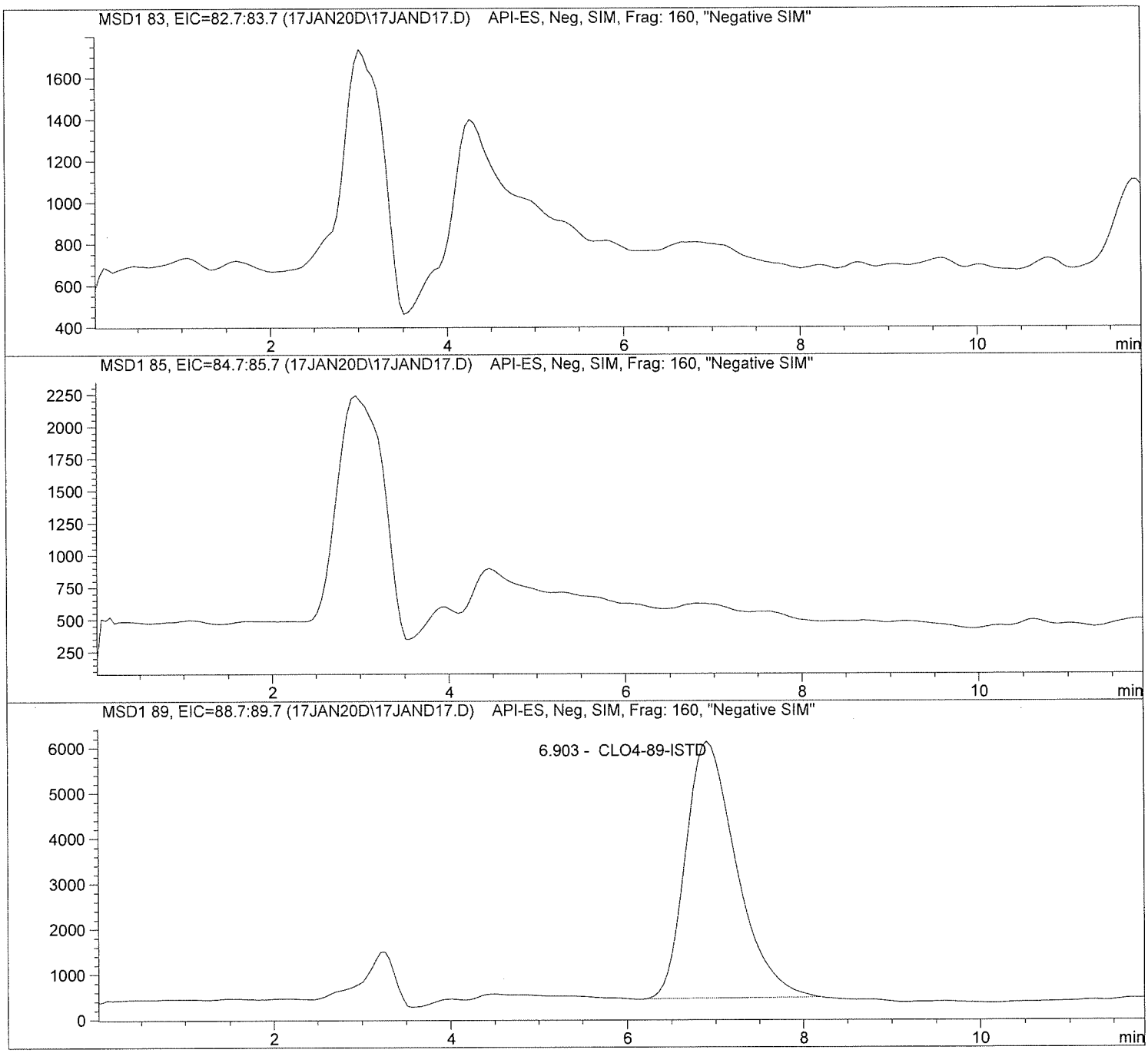
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND17.D Sample Name: 2004548009

Injection Date:	2/17/2020 12:30:39	Seq Line:	17
Sample Name:	2004548009	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: 2/17/2020 15:42:52

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND17.D Sample Name: 2004548009

Injection Date:	2/17/2020 12:30:39	Seq Line:	17
Sample Name:	2004548009	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: 2/17/2020 15:42:52

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
6.903	PBA	227261.6	5.0000	CLO4-89-ISTD

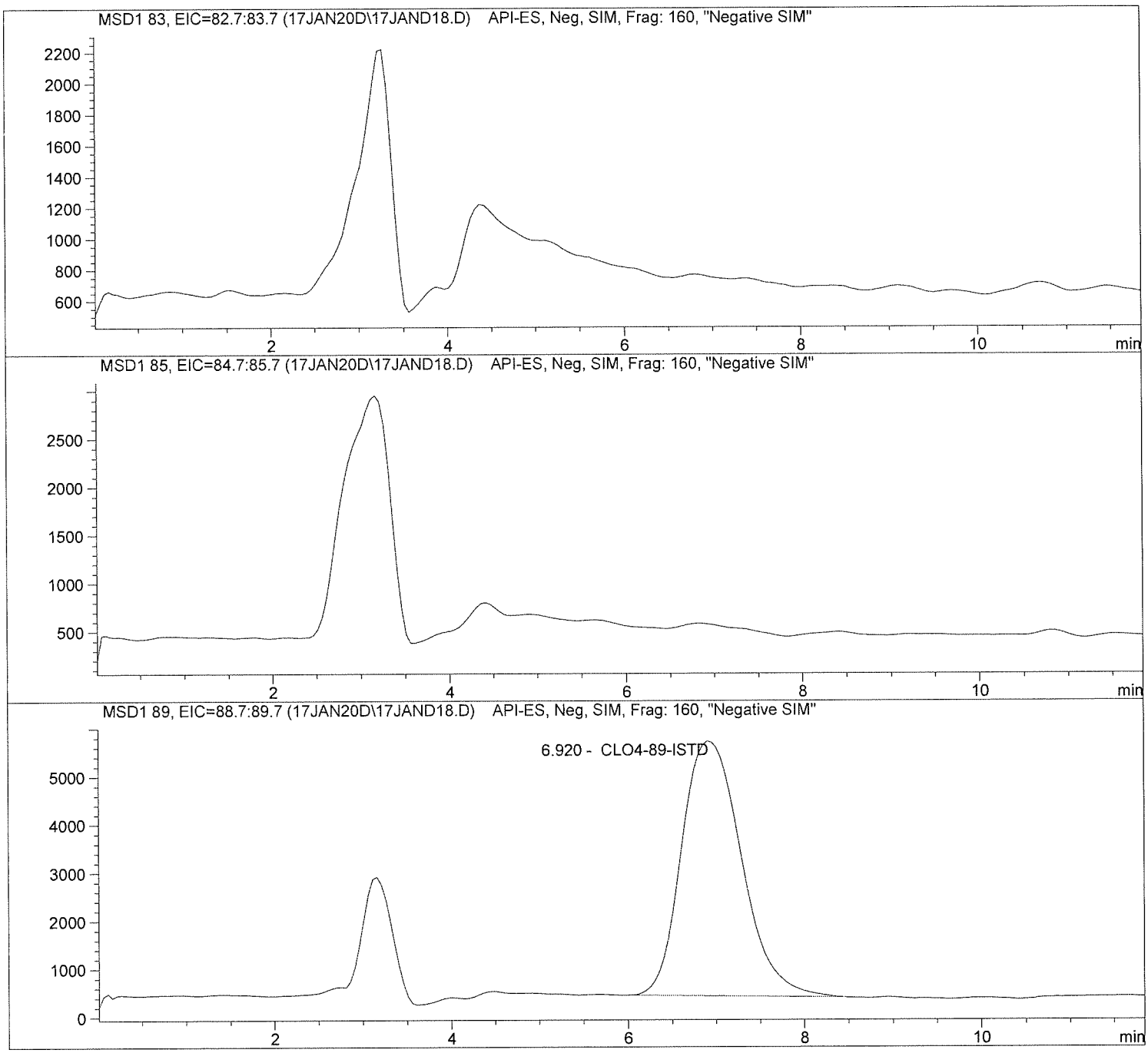
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND18.D Sample Name: 2004548010

Injection Date:	2/17/2020 12:44:31	Seq Line:	18
Sample Name:	2004548010	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: 2/17/2020 15:42:52

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND18.D Sample Name: 2004548010

Injection Date:	2/17/2020 12:44:31	Seq Line:	18
Sample Name:	2004548010	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: 2/17/2020 15:42:52

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
6.920	PBA	250414.9	5.0000	CLO4-89-ISTD

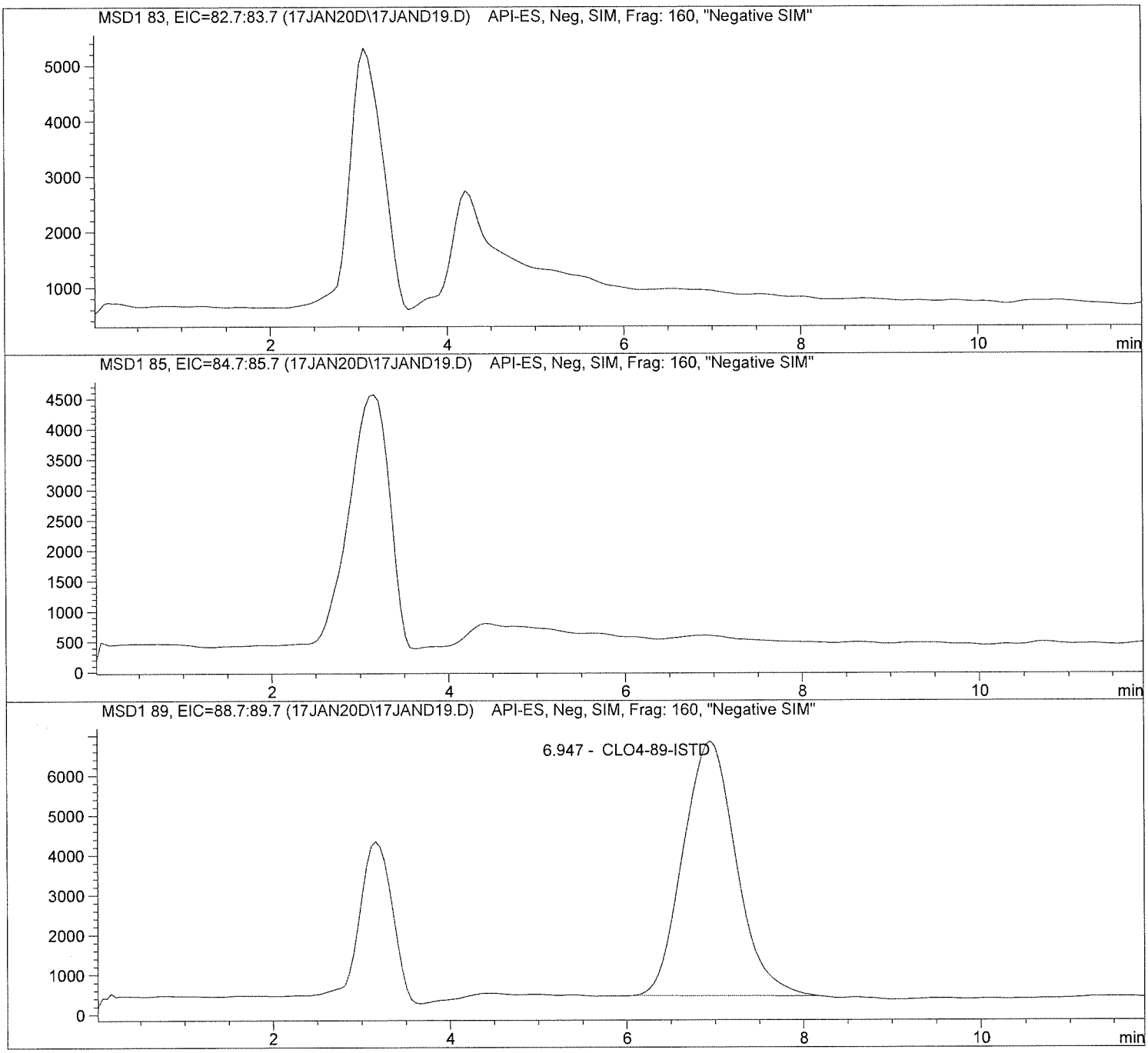
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND19.D Sample Name: 2004548011

Injection Date:	2/17/2020 12:58:22	Seq Line:	19
Sample Name:	2004548011	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: 2/17/2020 15:42:52

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND19.D Sample Name: 2004548011

Injection Date:	2/17/2020 12:58:22	Seq Line:	19
Sample Name:	2004548011	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: 2/17/2020 15:42:52

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
6.947	PBA	267411.8	5.0000	CLO4-89-ISTD

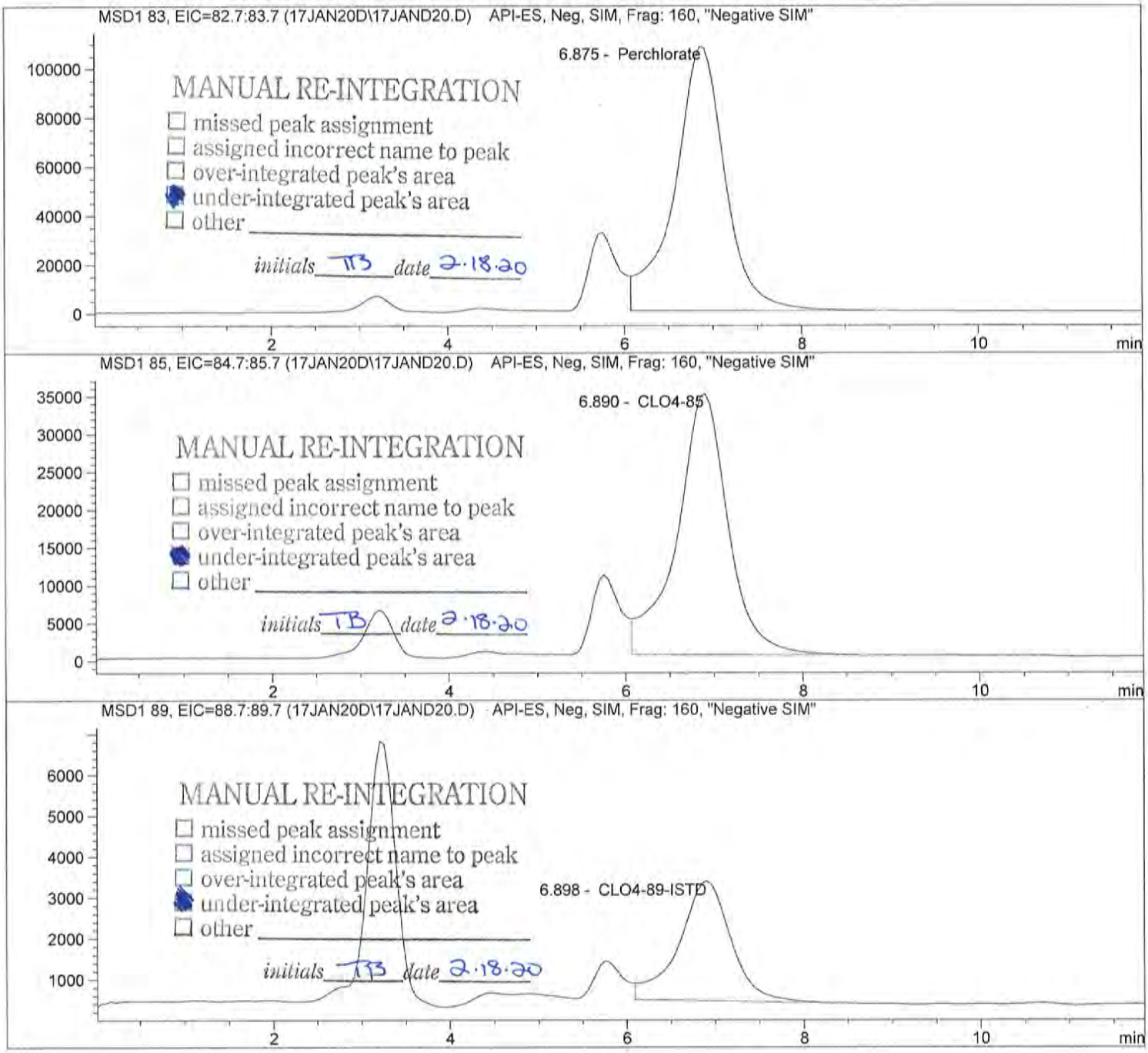
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND20.D Sample Name: 2004548012

Injection Date:	2/17/2020 13:12:19	Seq Line:	20
Sample Name:	2004548012	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: 2/17/2020 15:42:52

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND20.D Sample Name: 2004548012

Injection Date:	2/17/2020 13:12:19	Seq Line:	20
Sample Name:	2004548012	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: 2/17/2020 15:42:52

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
6.875	FM	4277198.5	94.6505	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.890	FM	1382737.4	100.2794	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.898	FM	119387.1	5.0000	CLO4-89-ISTD

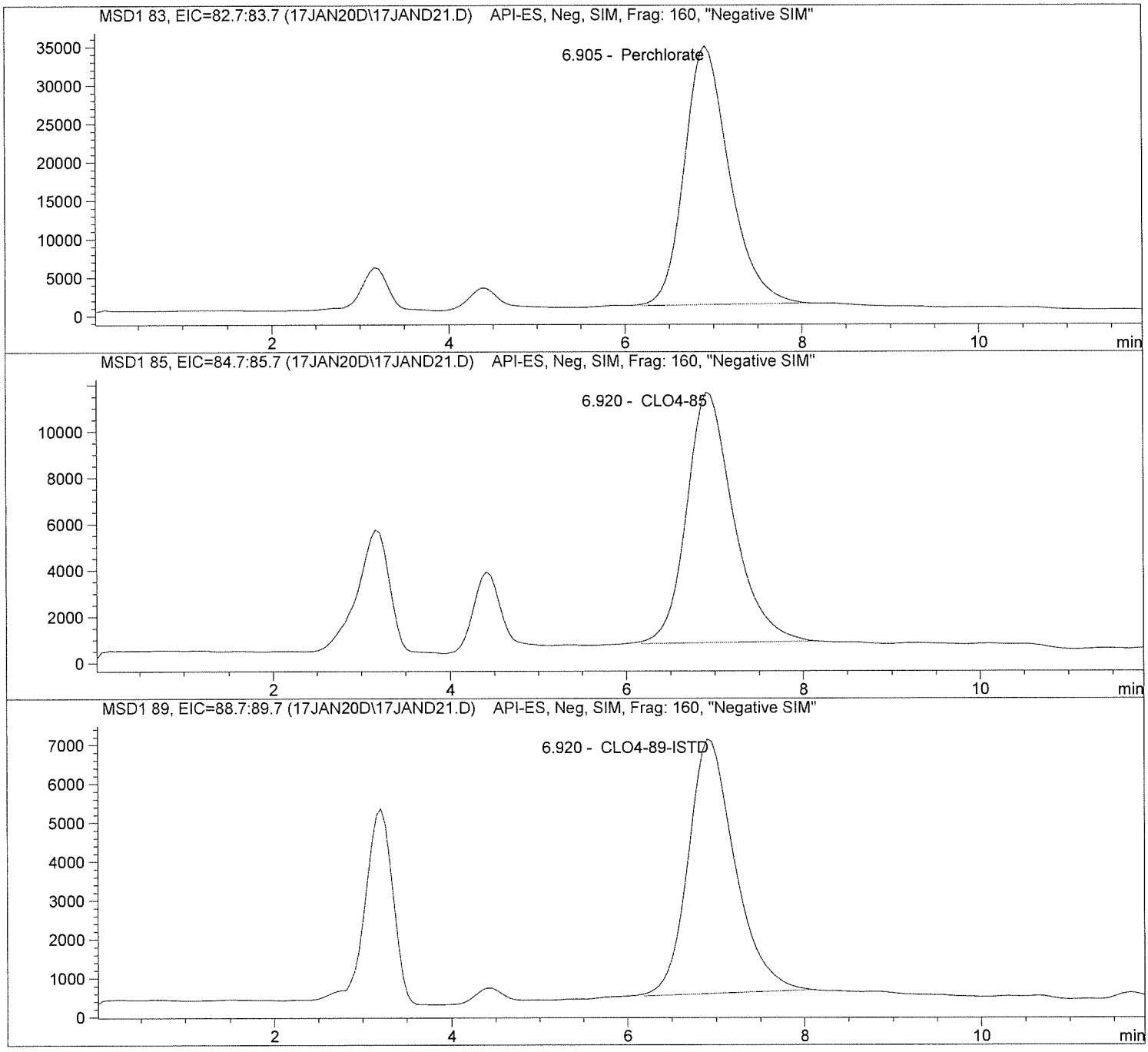
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND21.D Sample Name: 2004548013

Injection Date:	2/17/2020 13:26:12	Seq Line:	21
Sample Name:	2004548013	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: 2/17/2020 15:42:52

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND21.D Sample Name: 2004548013

Injection Date:	2/17/2020 13:26:12	Seq Line:	21
Sample Name:	2004548013	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: 2/17/2020 15:42:52

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
6.905	BBA	1185693.1	17.5126	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.920	BBA	397137.3	19.0629	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.920	BBA	238618.0	5.0000	CLO4-89-ISTD

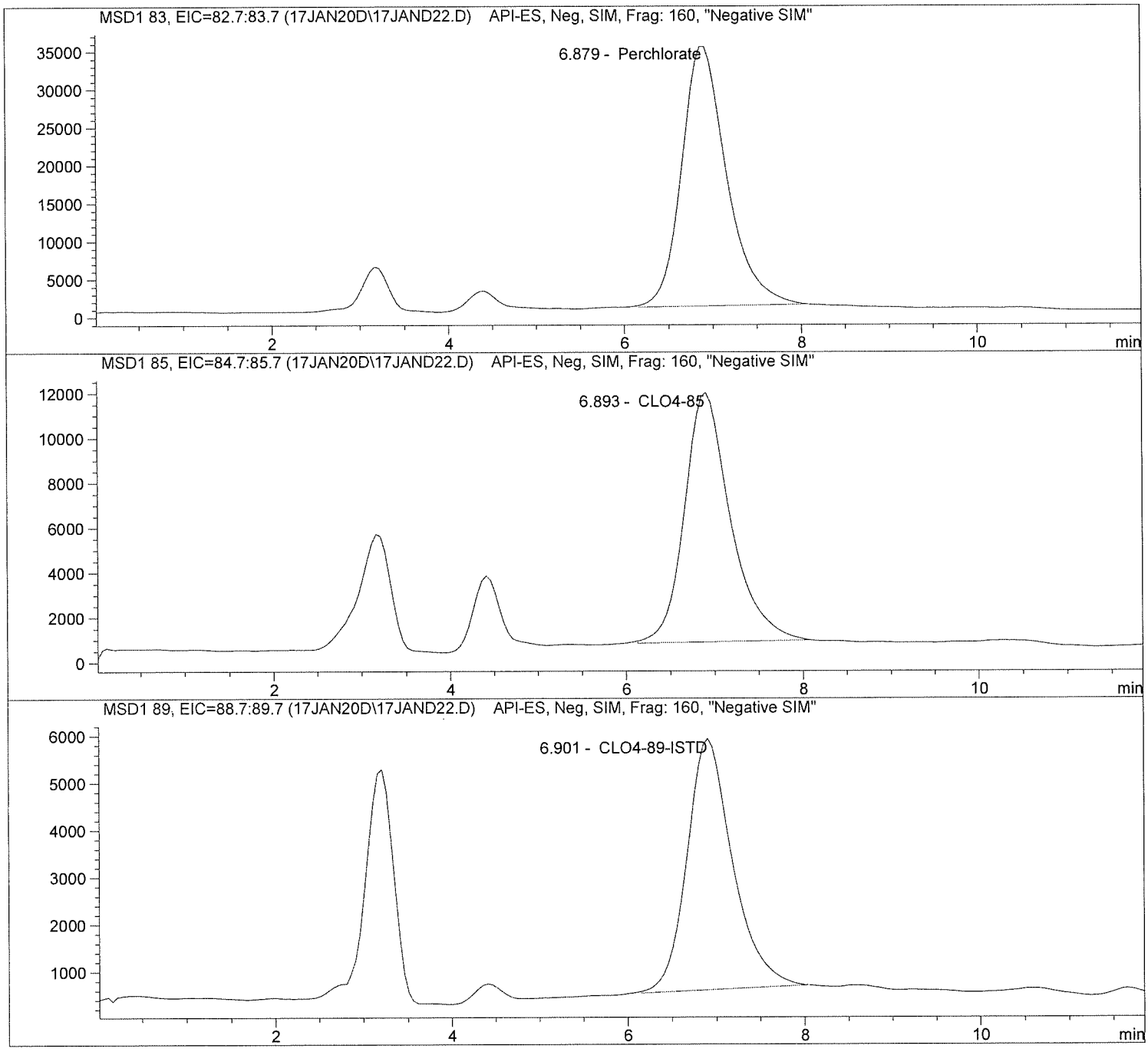
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND22.D Sample Name: 2004548014

Injection Date:	2/17/2020 13:40:06	Seq Line:	22
Sample Name:	2004548014	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: 2/17/2020 15:42:52

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND22.D Sample Name: 2004548014

Injection Date:	2/17/2020 13:40:06	Seq Line:	22
Sample Name:	2004548014	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: 2/17/2020 15:42:52

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
6.879	BBA	1208615.6	21.8897	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.893	BBA	402089.2	23.6919	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.901	BBA	191102.0	5.0000	CLO4-89-ISTD

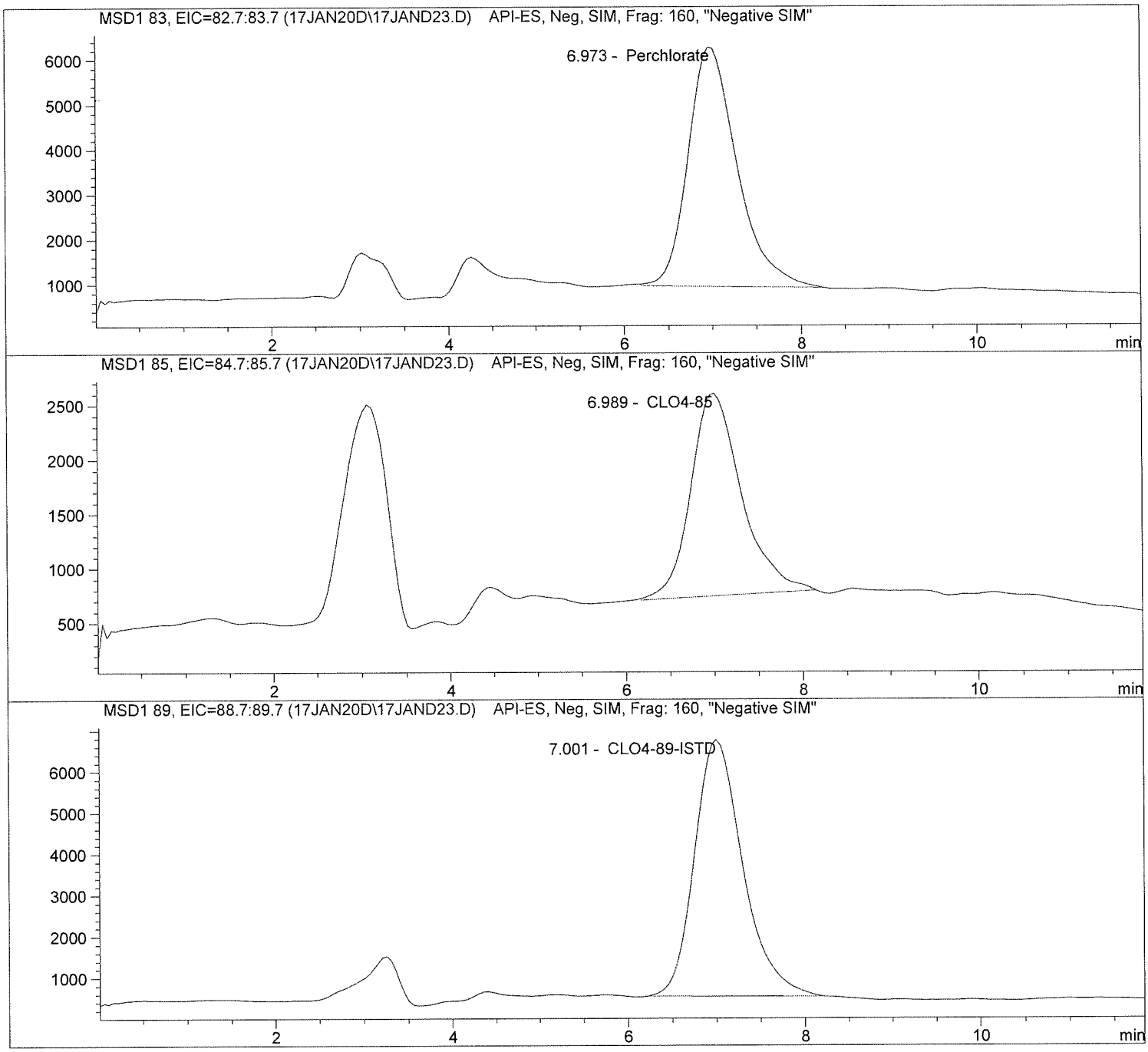
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND23.D Sample Name: 2004548015 MS

Injection Date:	2/17/2020 14:54:53	Seq Line:	23
Sample Name:	2004548015 MS	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: 2/17/2020 15:42:52

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND23.D Sample Name: 2004548015 MS

Injection Date:	2/17/2020 14:54:53	Seq Line:	23
Sample Name:	2004548015 MS	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: 2/17/2020 15:42:52

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	BBA	205914.9	3.1969	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.989	BBA	74577.8	3.7093	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.001	PBA	237178.4	5.0000	CLO4-89-ISTD

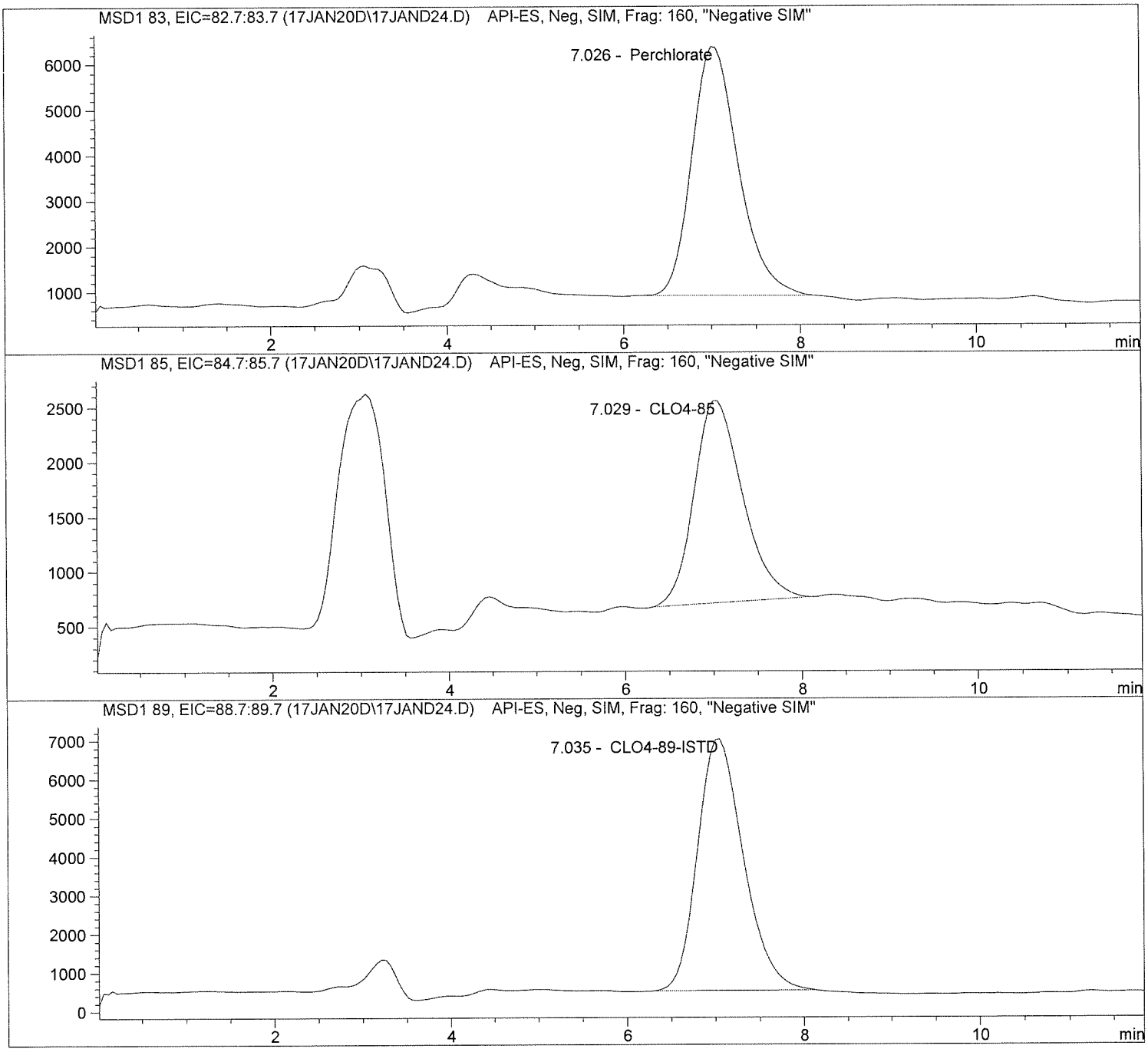
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND24.D Sample Name: 2004548016 MSD

Injection Date:	2/17/2020 15:08:46	Seq Line:	24
Sample Name:	2004548016 MSD	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: 2/17/2020 15:42:52

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND24.D Sample Name: 2004548016 MSD

Injection Date:	2/17/2020 15:08:46	Seq Line:	24
Sample Name:	2004548016 MSD	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: 2/17/2020 15:42:52

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
7.026	BBA	199352.0	3.1385	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.029	PBA	70132.0	3.5331	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.035	PBA	233840.1	5.0000	CLO4-89-ISTD

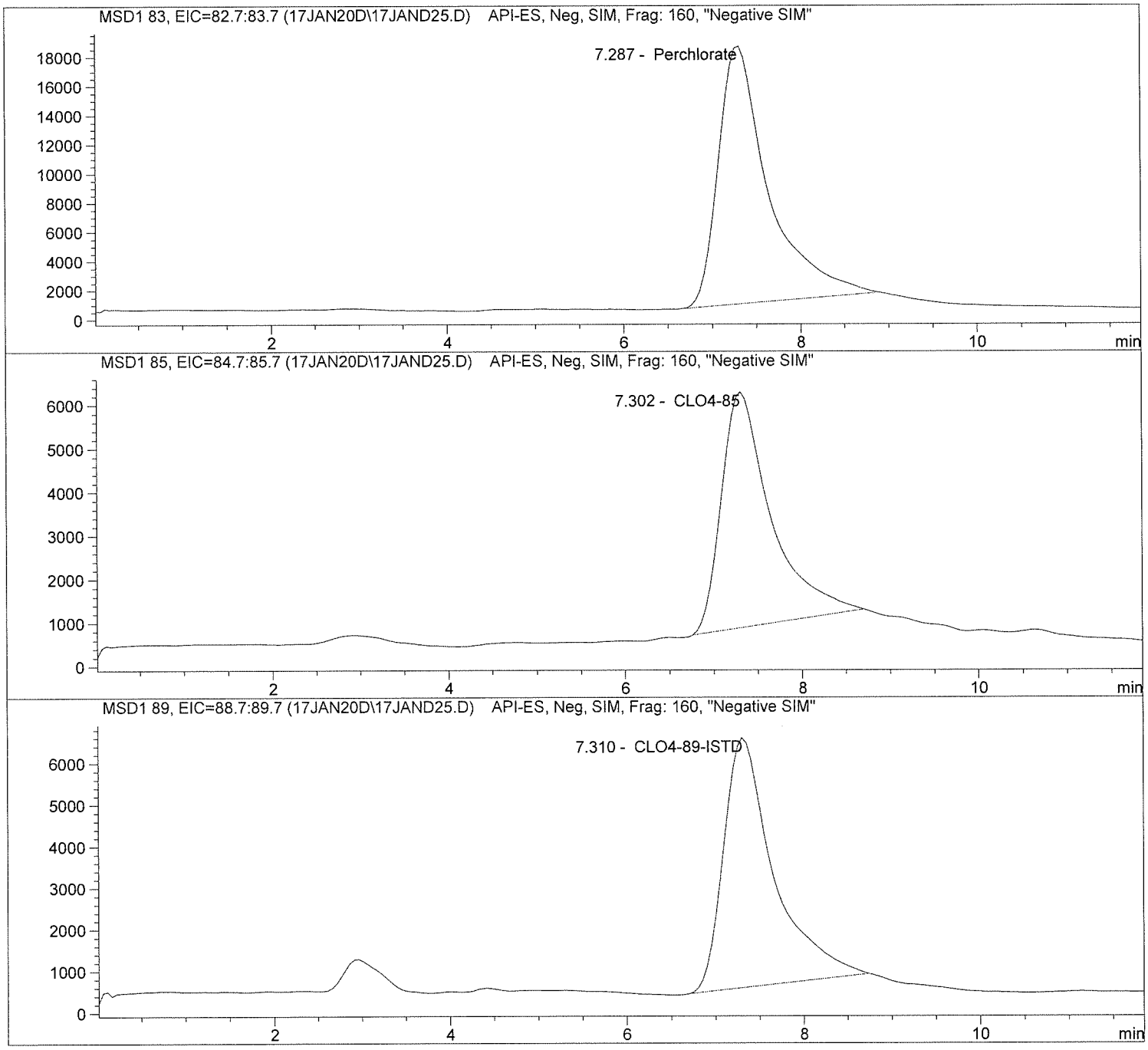
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND25.D Sample Name: 2004545001 1K

Injection Date:	2/17/2020 15:22:38	Seq Line:	25
Sample Name:	2004545001 1K	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: 2/17/2020 15:42:52

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND25.D Sample Name: 2004545001 1K

Injection Date:	2/17/2020 15:22:38	Seq Line:	25
Sample Name:	2004545001 1K	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: 2/17/2020 15:42:52

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
7.287	PBA	698274.0	10634.7156	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.302	PBA	211342.7	10471.5946	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.310	PBA	237890.8	5000.0000	CLO4-89-ISTD

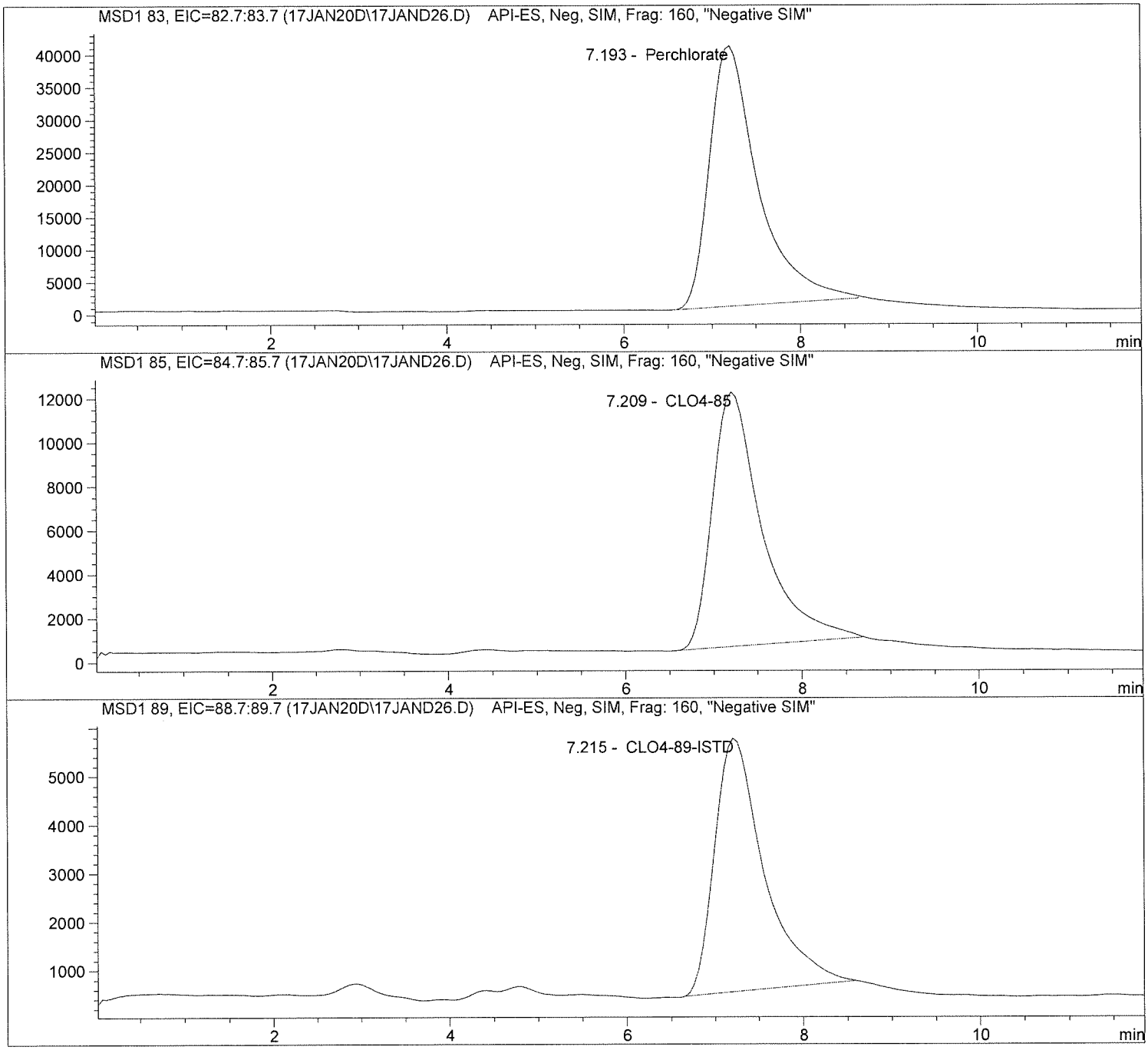
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND26.D Sample Name: 695968 CCV@25

Injection Date:	2/17/2020 15:36:30	Seq Line:	26
Sample Name:	695968 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: 2/17/2020 15:42:52

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND26.D Sample Name: 695968 CCV@25

Injection Date:	2/17/2020 15:36:30	Seq Line:	26
Sample Name:	695968 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: 2/17/2020 15:42:52

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
7.193	PBA	1543213.8	25.7523	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.209	PBA	453507.4	24.9041	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.215	PBA	204125.2	5.0000	CLO4-89-ISTD

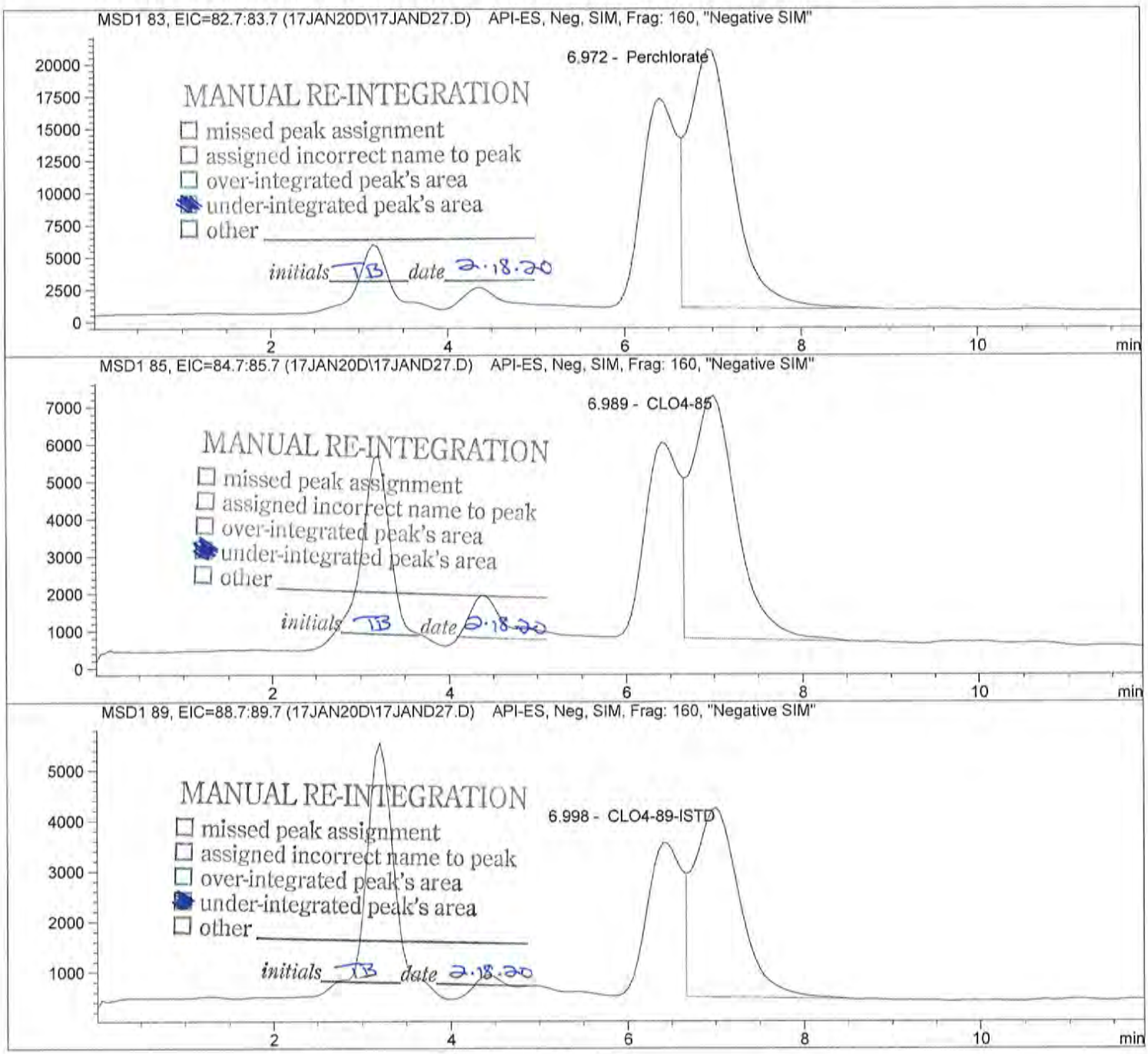
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND27.D Sample Name: 2004548008 RE

Injection Date:	2/17/2020 15:50:22	Seq Line:	27
Sample Name:	2004548008 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: 2/17/2020 15:42:52

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND27.D Sample Name: 2004548008 RE

Injection Date:	2/17/2020 15:50:22	Seq Line:	27
Sample Name:	2004548008 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:	2/17/2020 15:42:52

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
6.972	FM	697531.6	18.6067	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.989	FM	226846.6	19.7083	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.998	FM	131526.5	5.0000	CLO4-89-ISTD

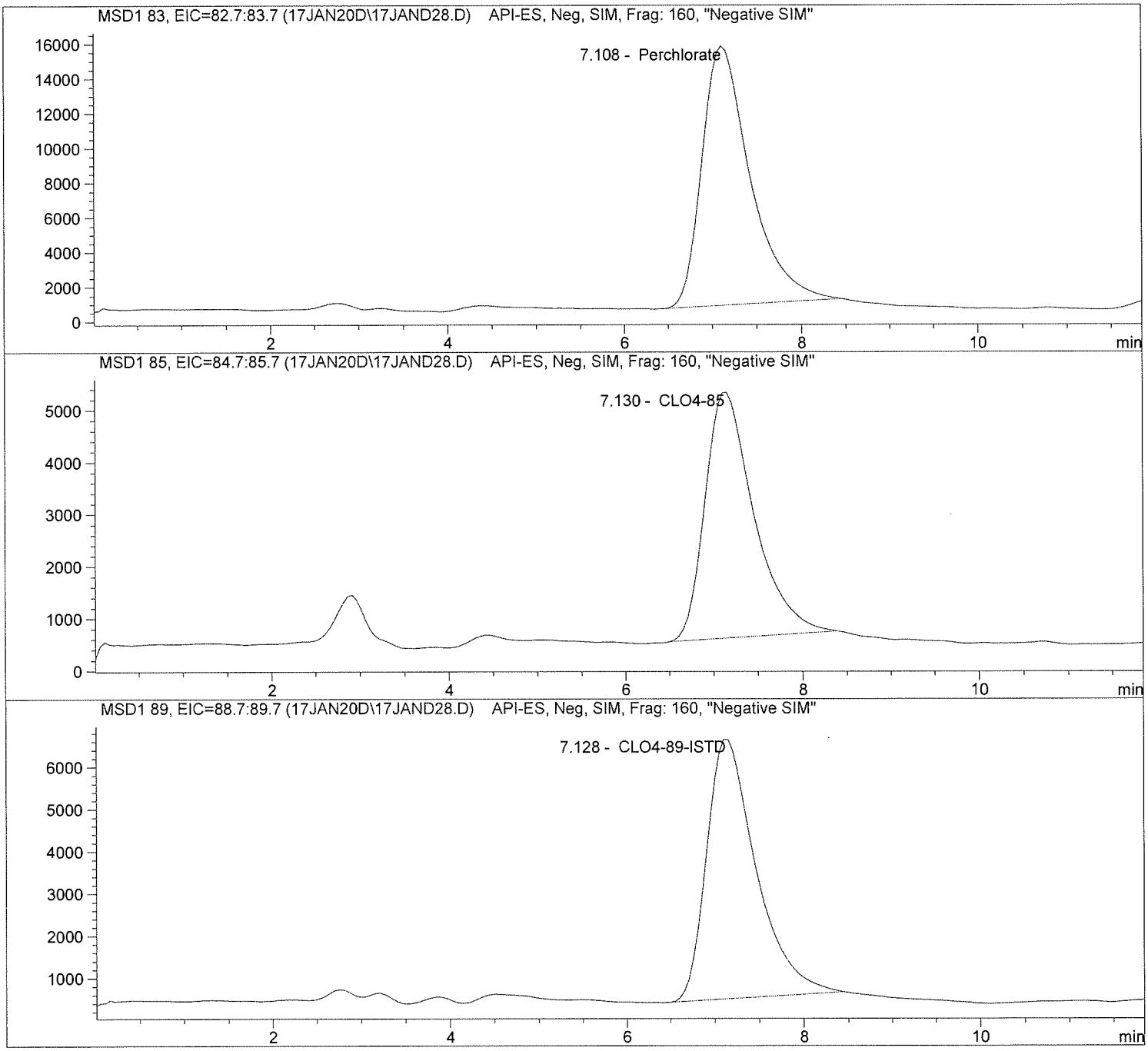
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND28.D Sample Name: 2004548012 10X

Injection Date:	2/17/2020 16:04:15	Seq Line:	28
Sample Name:	2004548012 10X	Location:	Vial 95
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 2/17/2020 15:42:52

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND28.D Sample Name: 2004548012 10X

Injection Date:	2/17/2020 16:04:15	Seq Line:	28
Sample Name:	2004548012 10X	Location:	Vial 95
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 2/17/2020 15:42:52

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
7.108	PBA	564189.9	86.4519	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.130	PBA	180716.6	89.7731	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.128	PBA	238166.1	50.0000	CLO4-89-ISTD

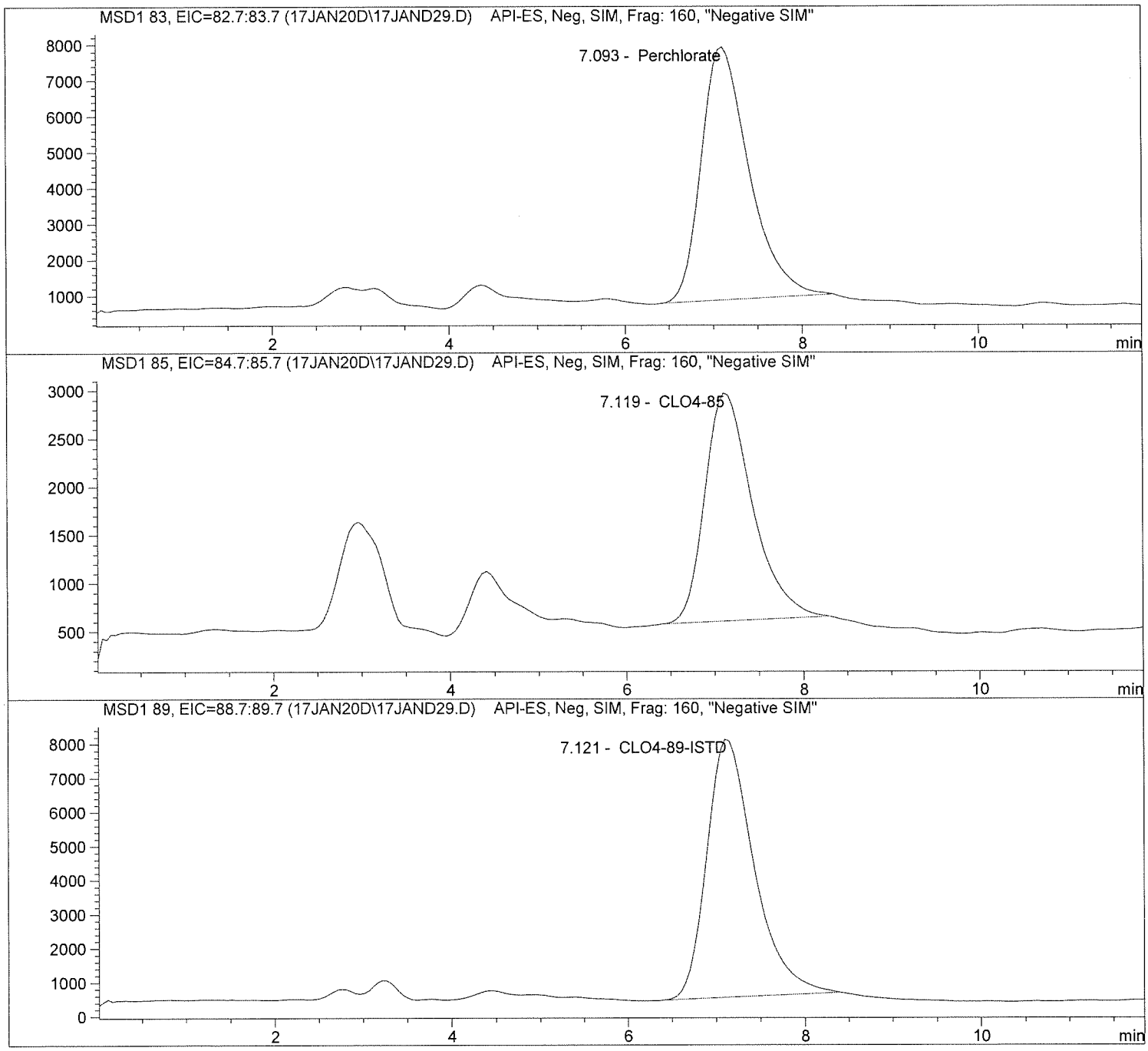
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND29.D Sample Name: 2004548008 5X

Injection Date:	2/17/2020 16:20:33	Seq Line:	29
Sample Name:	2004548008 5X	Location:	Vial 96
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 2/17/2020 15:42:52

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND29.D Sample Name: 2004548008 5X

Injection Date:	2/17/2020 16:20:33	Seq Line:	29
Sample Name:	2004548008 5X	Location:	Vial 96
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 2/17/2020 15:42:52

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
7.093	PBA	264236.7	17.2945	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.119	BBA	88185.4	18.4759	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.121	PBA	281500.3	25.0000	CLO4-89-ISTD

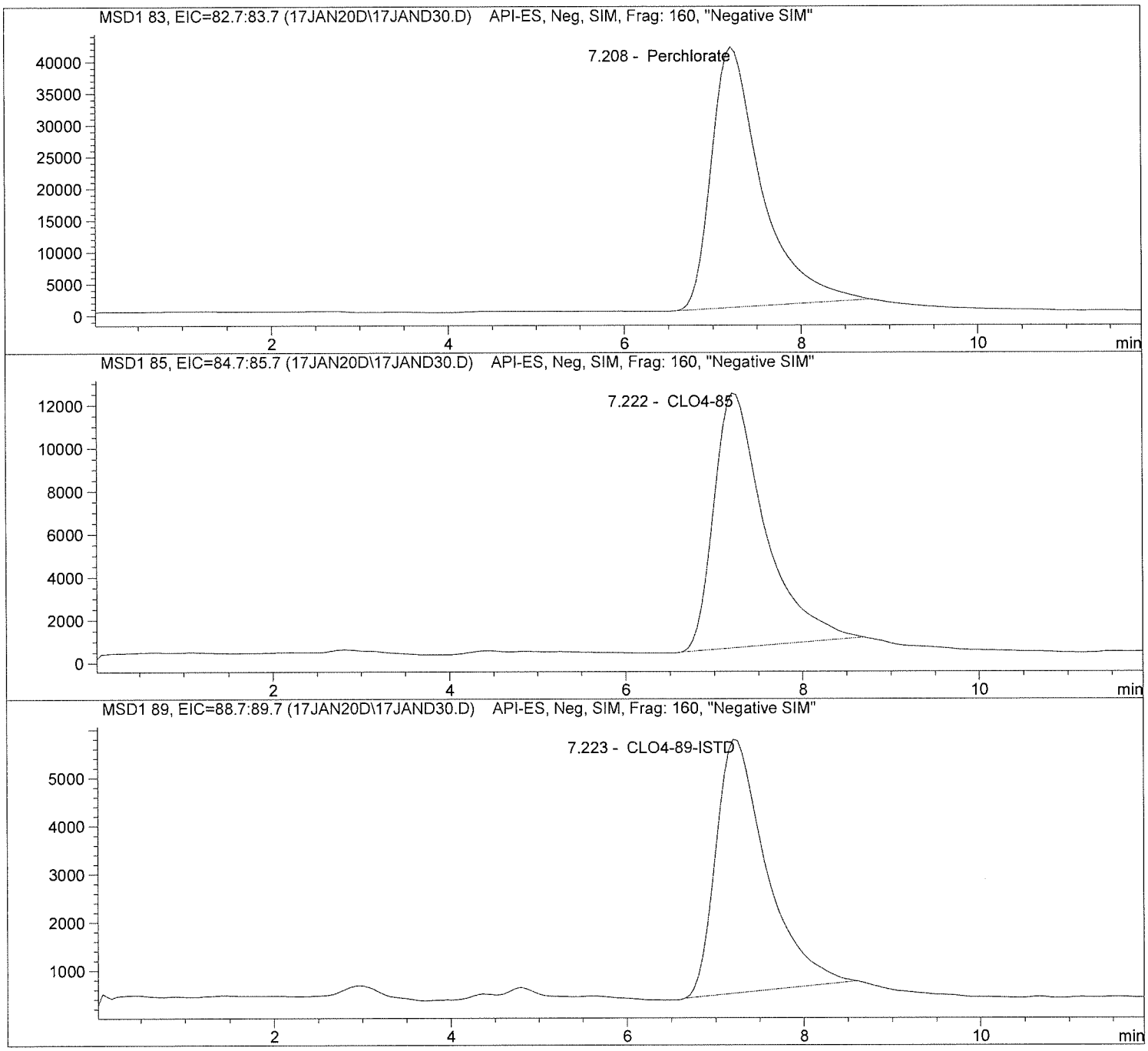
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND30.D Sample Name: 696082 CCV@25

Injection Date:	2/17/2020 16:34:25	Seq Line:	30
Sample Name:	696082 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: 2/17/2020 15:42:52

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND30.D Sample Name: 696082 CCV@25

Injection Date:	2/17/2020 16:34:25	Seq Line:	30
Sample Name:	696082 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:	2/17/2020 15:42:52

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
7.208	PBA	1618661.2	26.2692	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.222	PBA	474563.2	25.3555	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.223	PBA	209446.6	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
		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]	Sig	Lvl	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

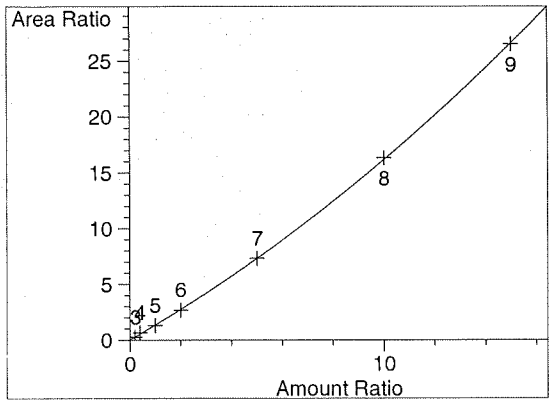
Compound: CLO4-89-ISTD
- Time Window : From 3.581 min To 11.896 min
- Curve Type : Linear
- Origin : Included
- Calibration Level Weights:/
  - Level 3 : 1
  - Level 4 : 1
  - Level 5 : 1
  - Level 6 : 1
  - Level 7 : 1
  - Level 8 : 1
  - Level 9 : 1

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

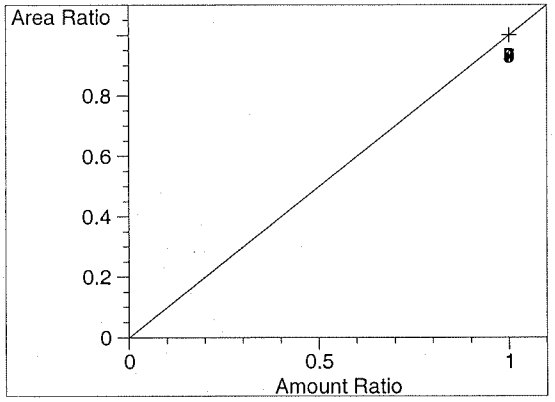
Peak Sum Table

No Entries in table

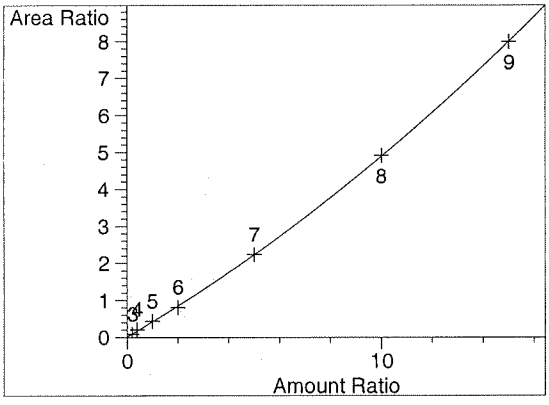
Calibration Curves



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:

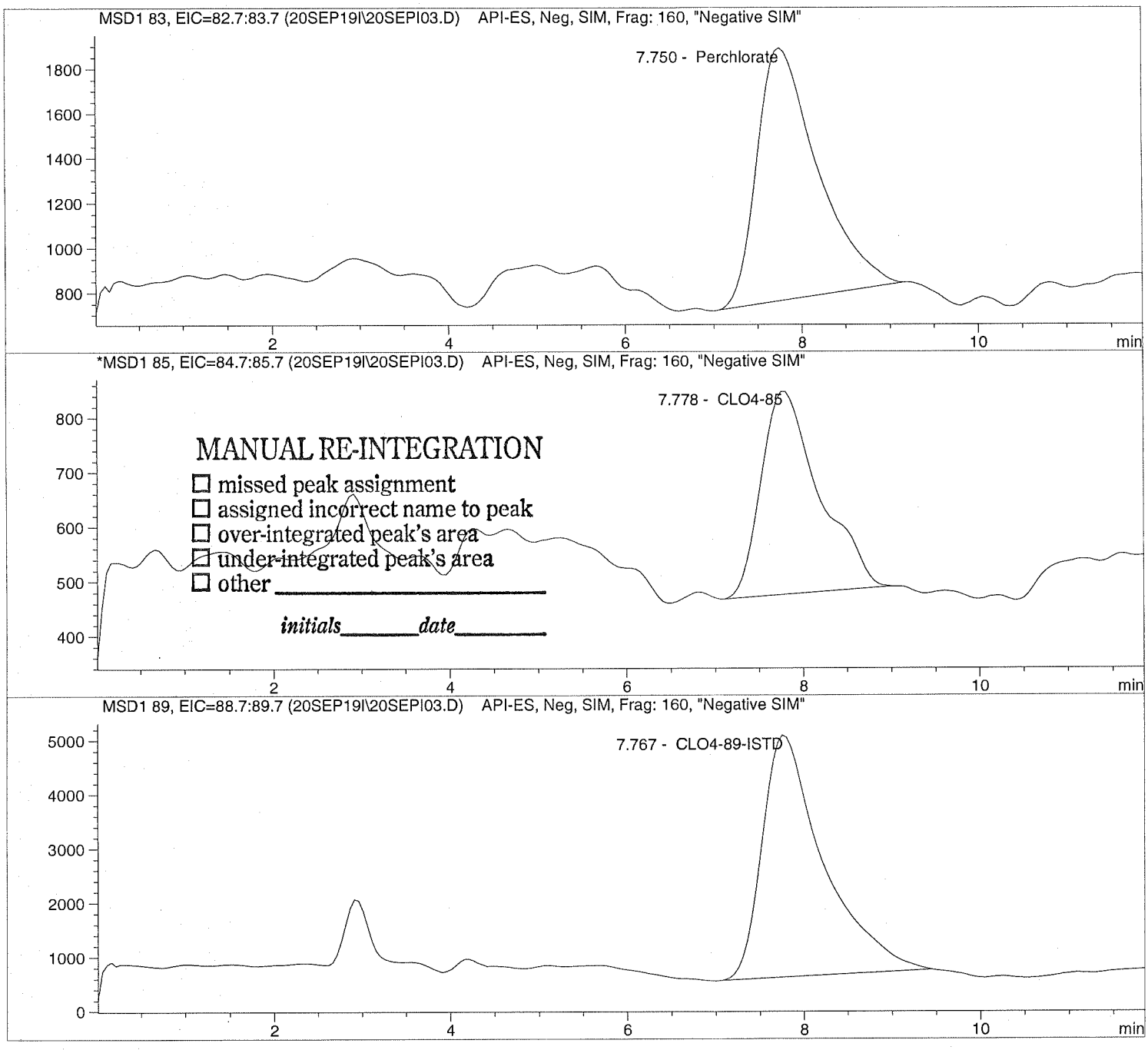
Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
1	Vial 71	CLO4@ 0.2ug/L	CLO4-AQN	1	Ctrl Samp		
2	Vial 72	CLO4@ 0.5ug/L	CLO4-AQN	1	Ctrl Samp		
3	Vial 73	CLO4@ 1.0ug/L	CLO4-AQN	1	Ctrl Samp		
4	Vial 74	CLO4@ 2.0ug/L	CLO4-AQN	1	Ctrl Samp		
5	Vial 75	CLO4@ 5.0ug/L	CLO4-AQN	1	Ctrl Samp		
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

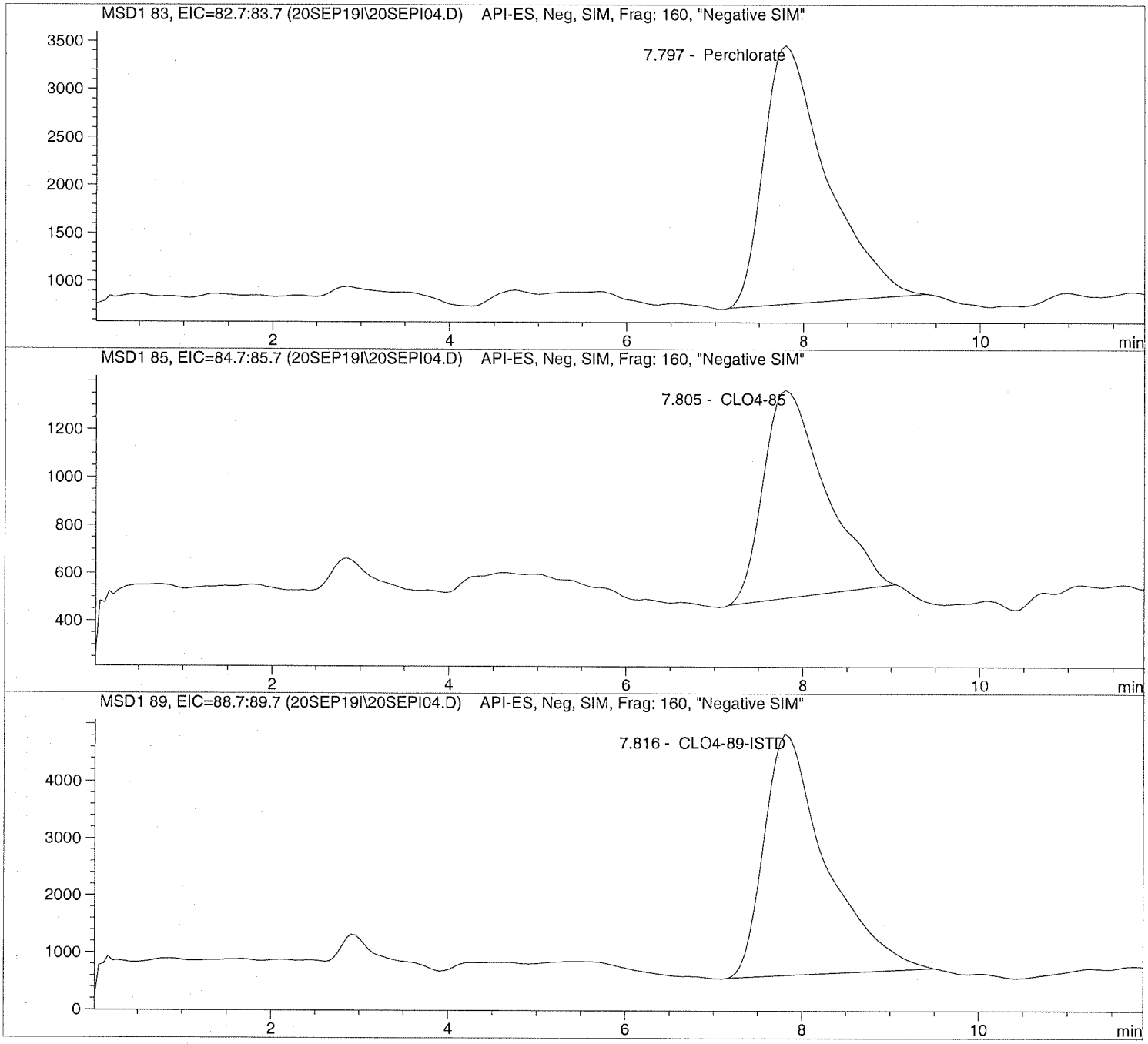
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI04.D Sample Name: CLO4@ 2.0ug/L

Injection Date:	9/20/2019 09:37:58	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

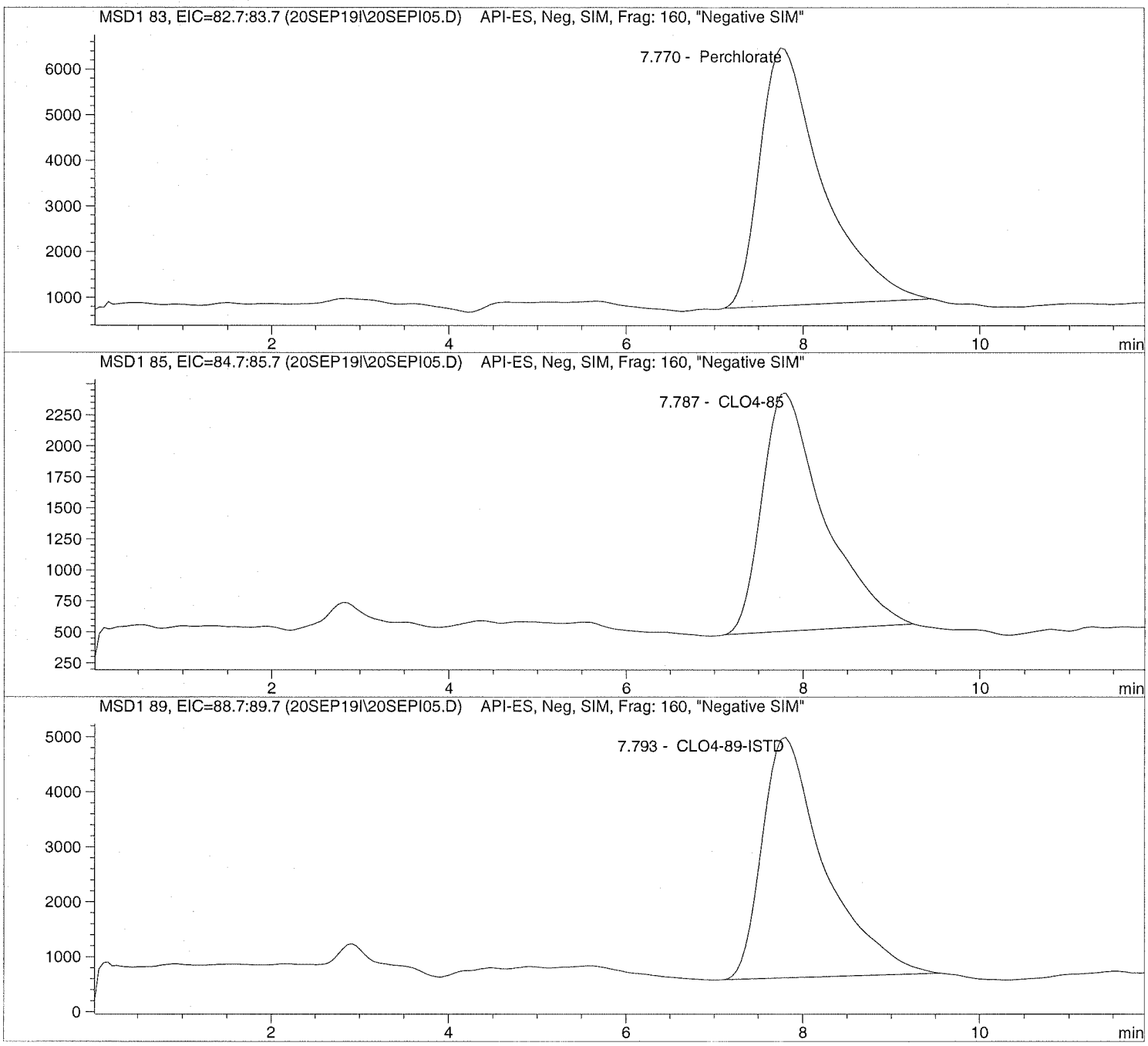
*** End of Report ***

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

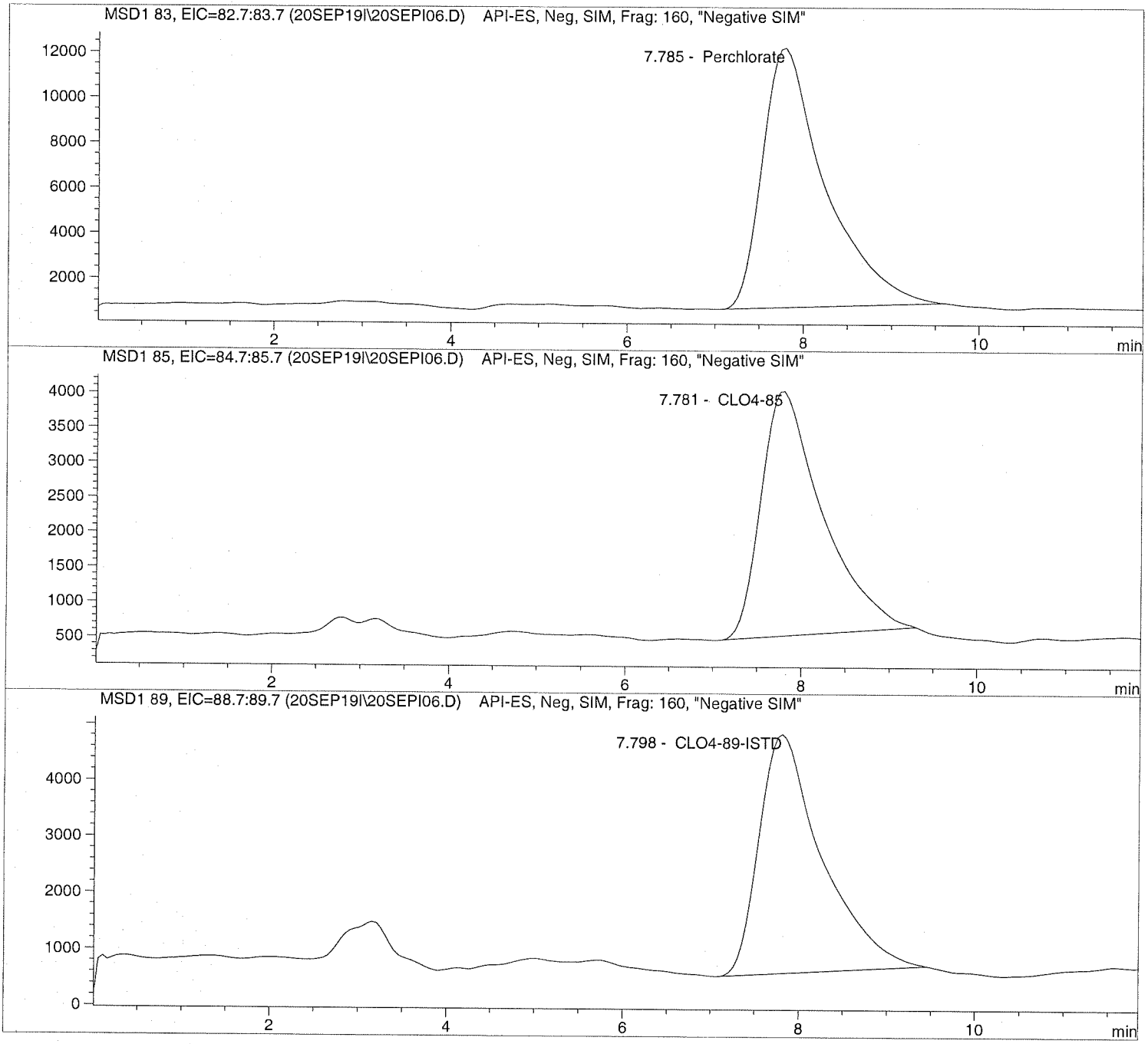
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI06.D Sample Name: CLO4@ 10.ug/L

Injection Date:	9/20/2019 10:05:36	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

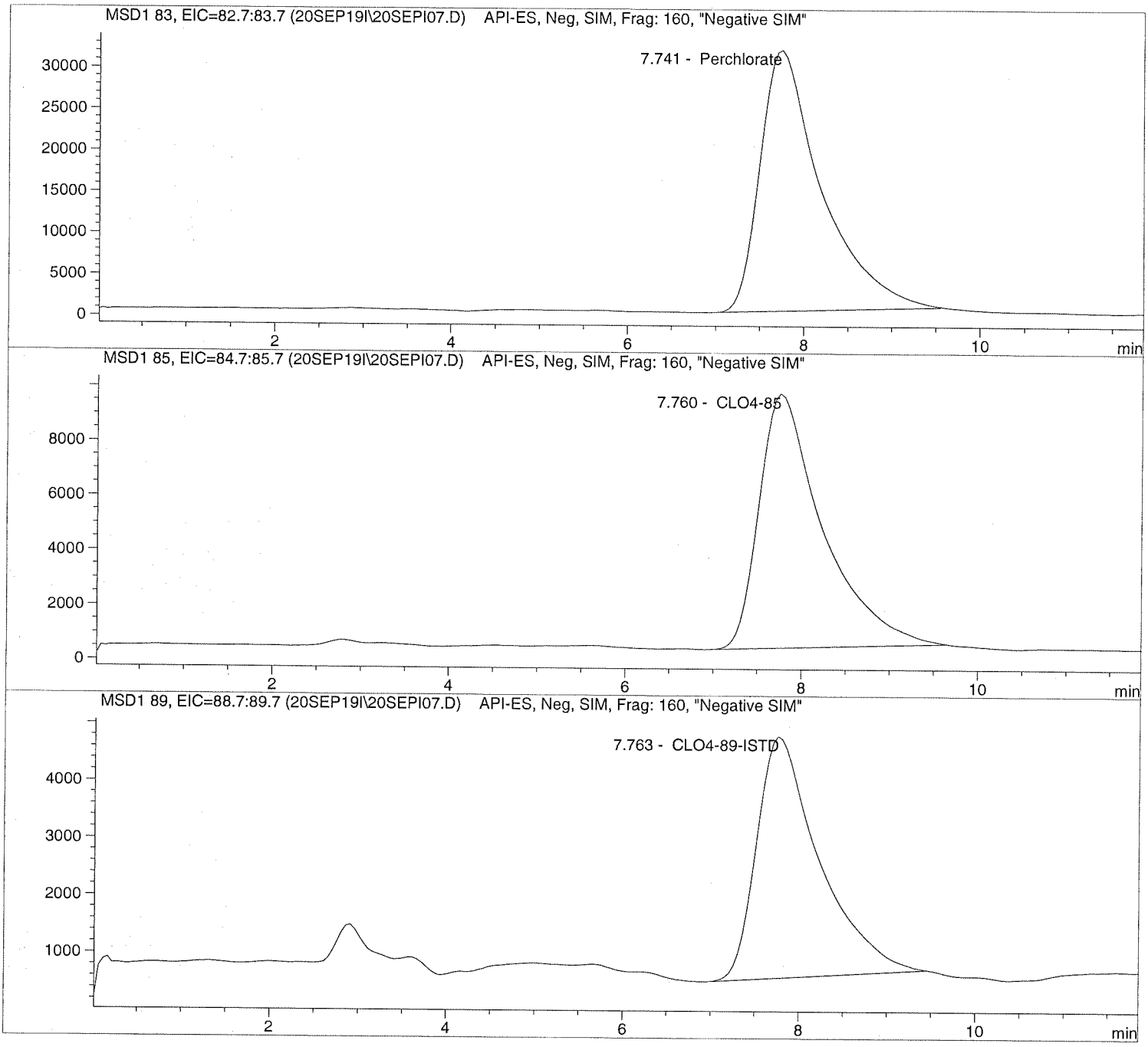
*** End of Report ***

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

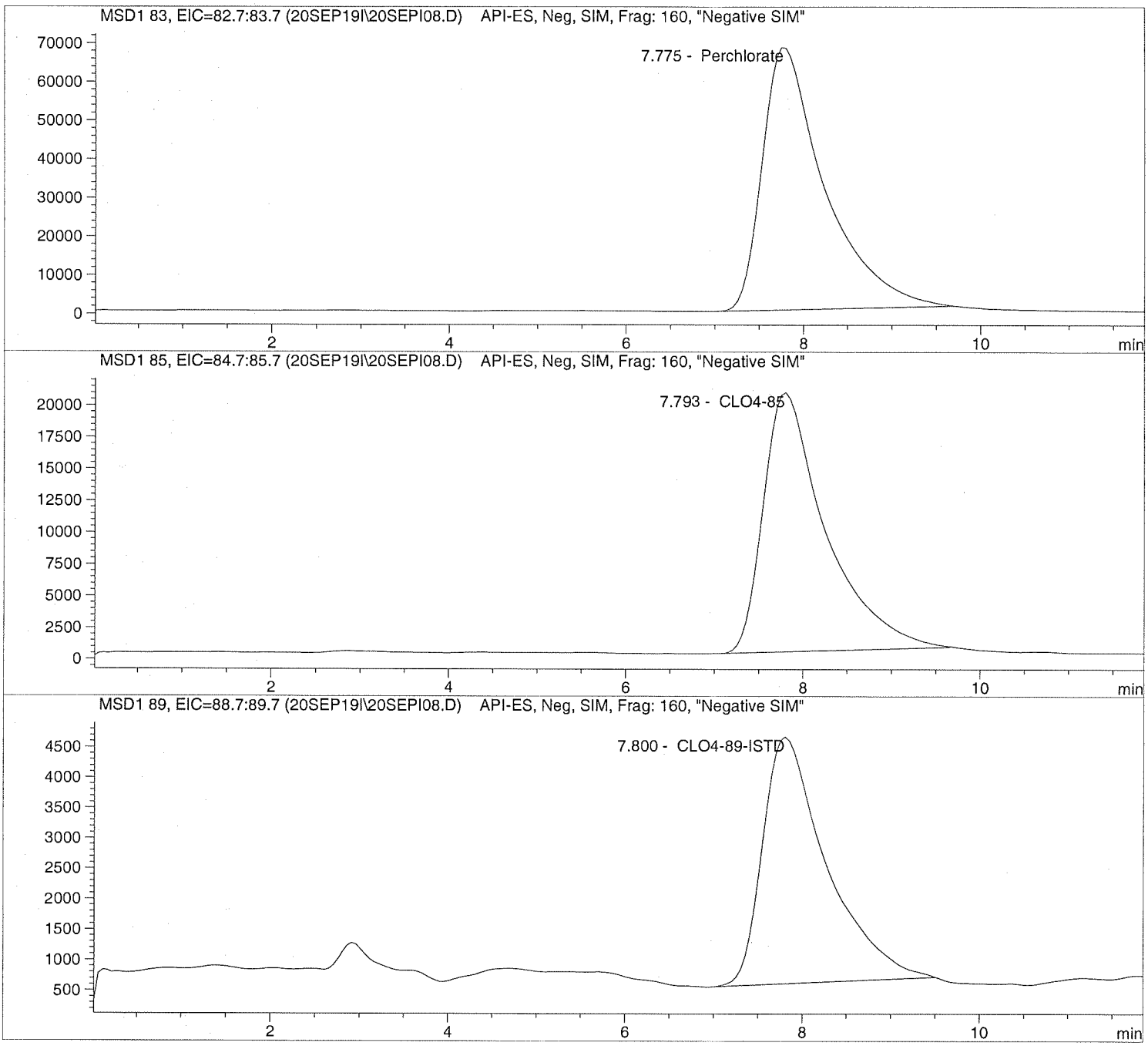
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\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

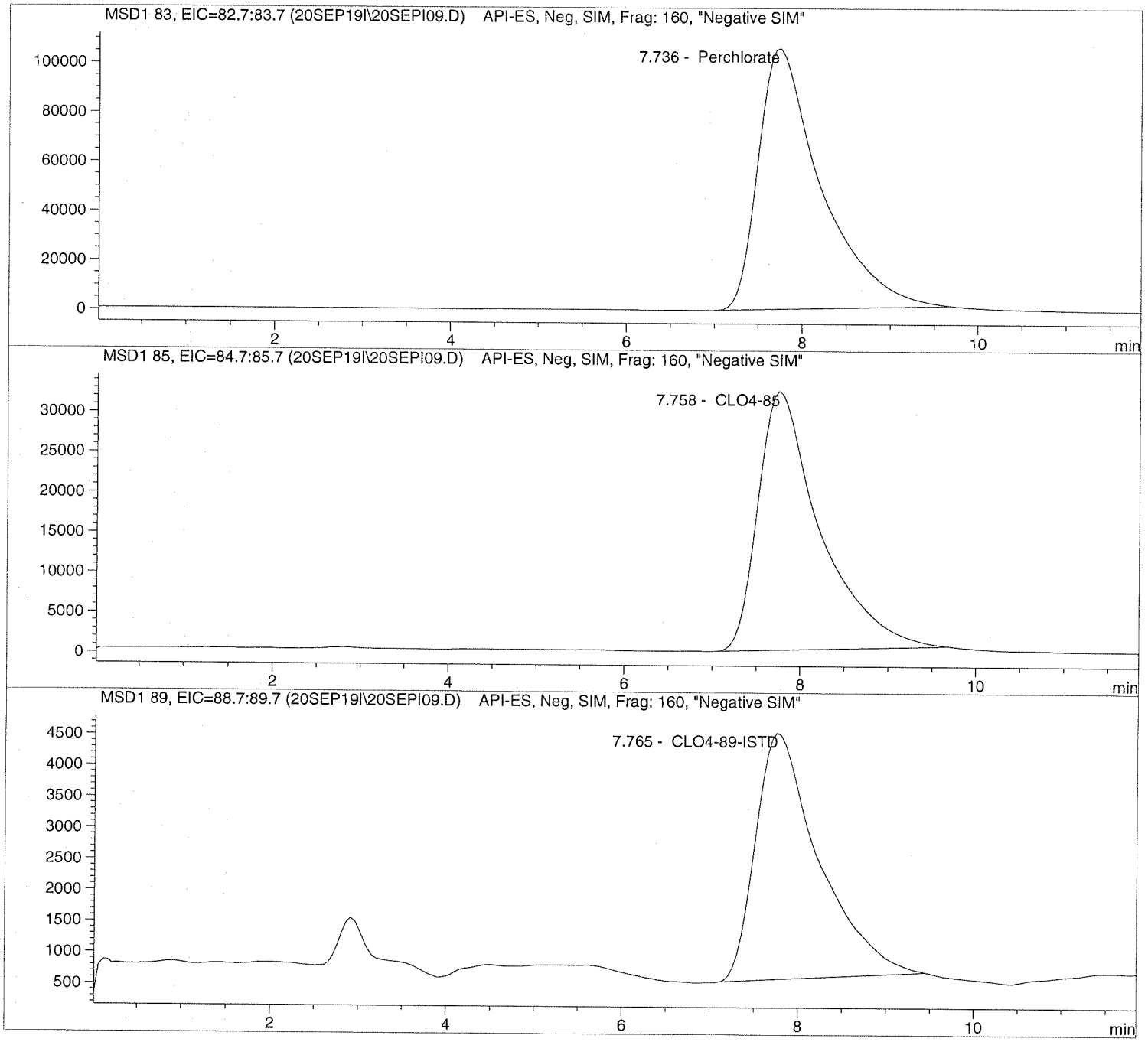
*** End of Report ***

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

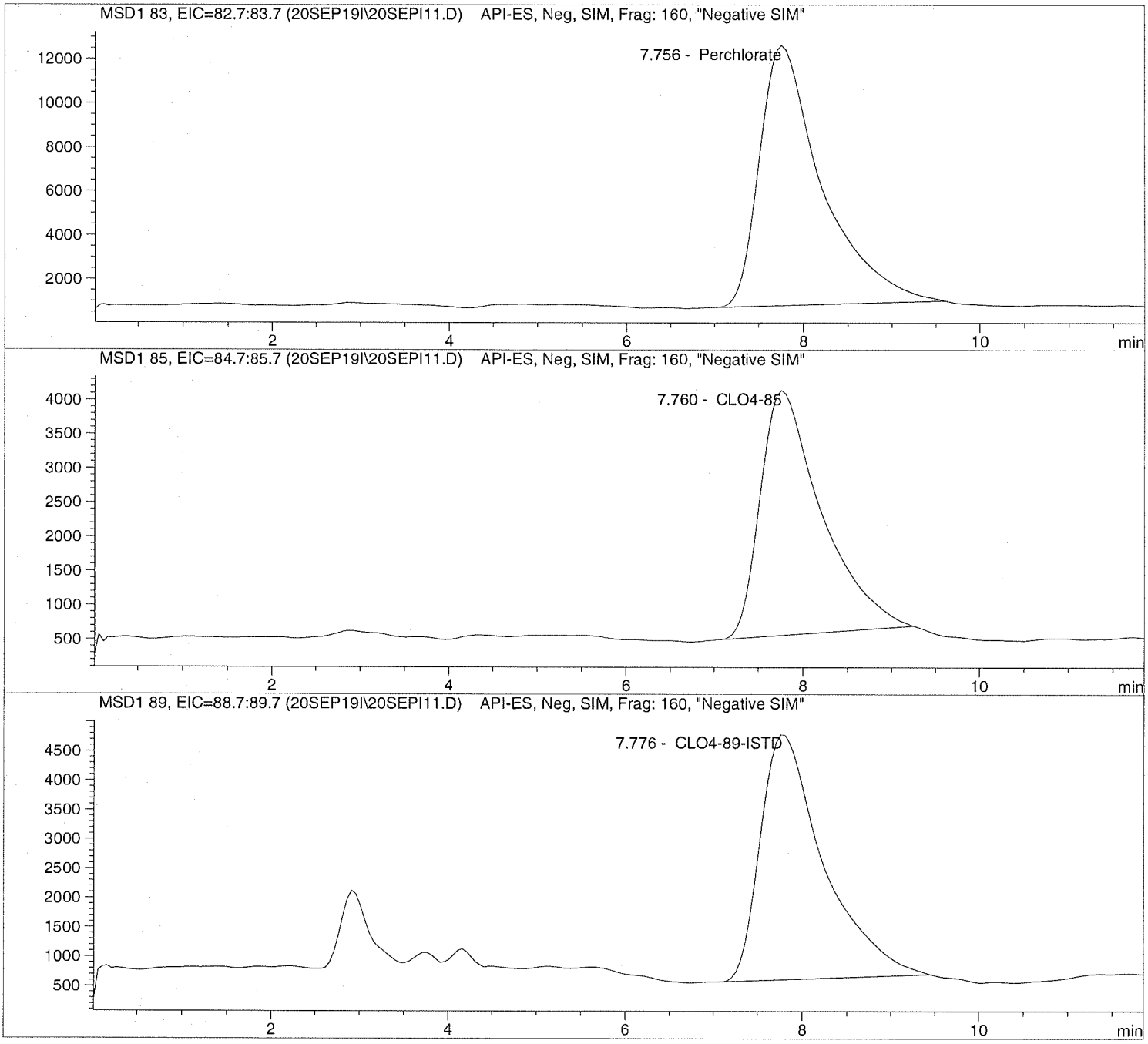
*** End of Report ***

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

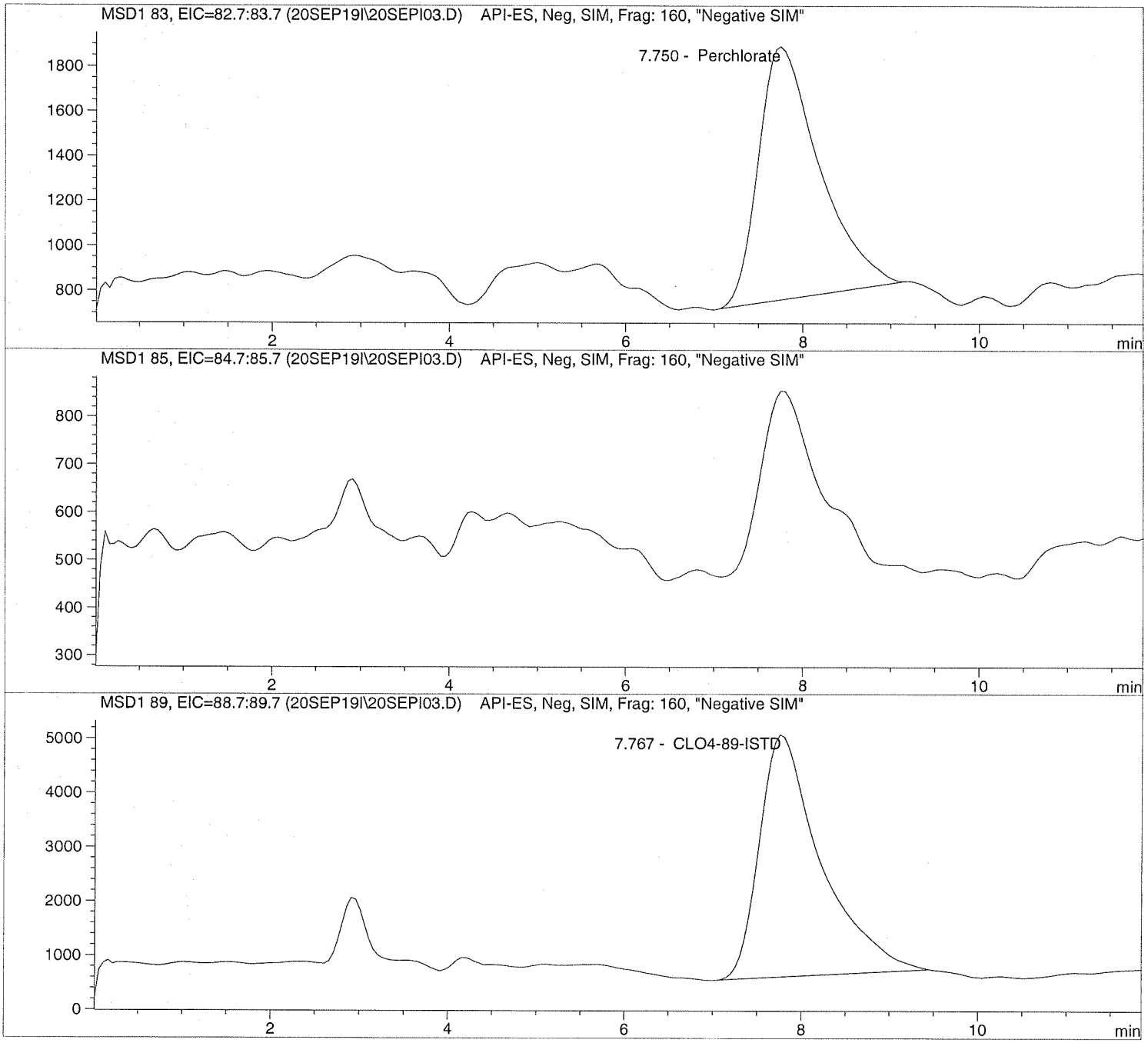
Unmodified

Data file: C:\HPCHEM\1\DATA\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

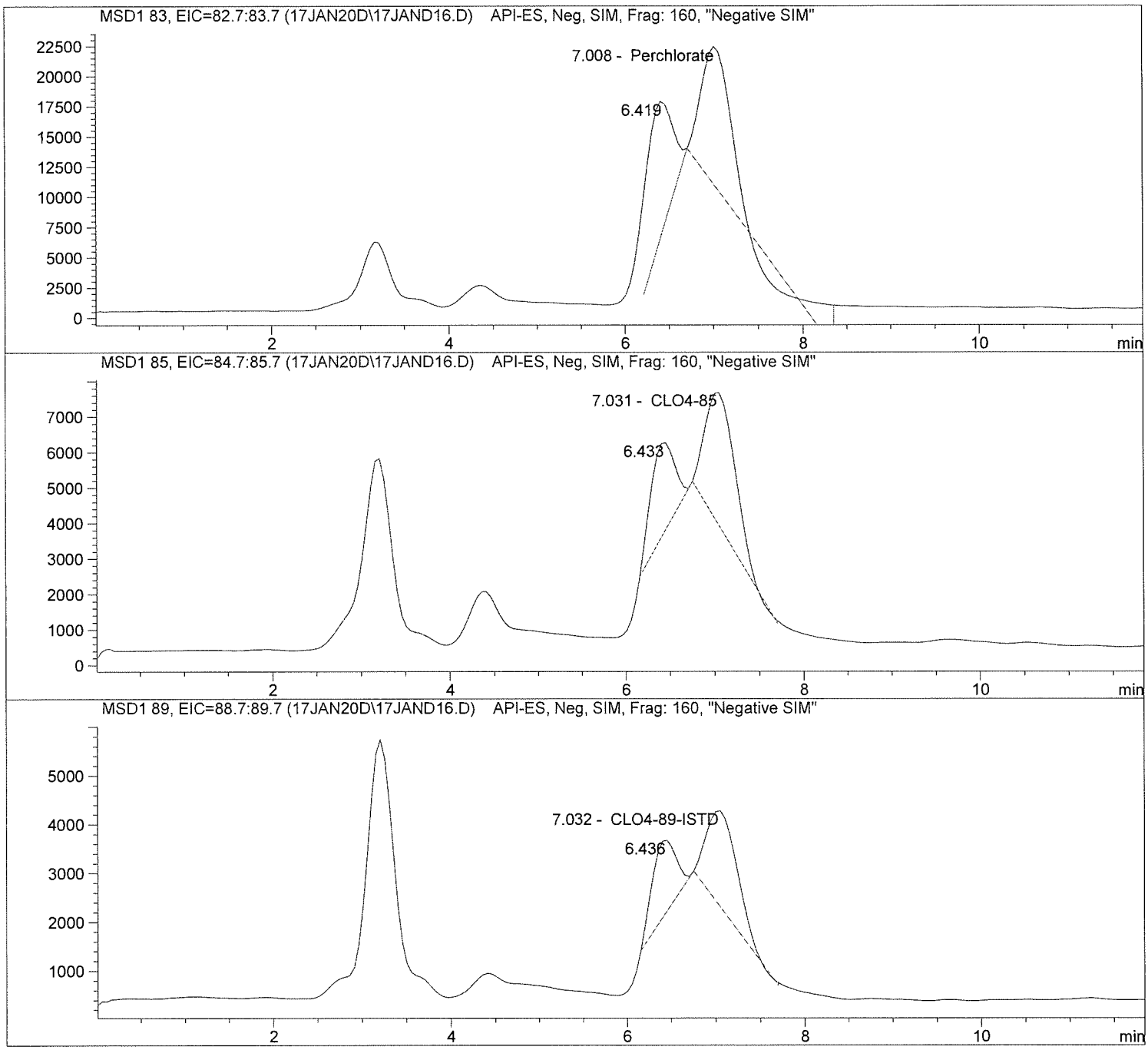
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND16.D Sample Name: 2004548008

Injection Date:	2/17/2020 12:16:47	Seq Line:	16
Sample Name:	2004548008	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: 2/17/2020 15:42:52

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND16.D Sample Name: 2004548008

Injection Date:	2/17/2020 12:16:47	Seq Line:	16
Sample Name:	2004548008	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: 2/17/2020 15:42:52

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
6.419	PB	209415.0	0.0000	
7.008	VBA	265970.0	19.8263	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.433	PB	48374.9	0.0000	
7.031	VBA	86453.2	20.9963	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.436	PB	28797.6	0.0000	
7.032	VBA	46829.2	5.0000	CLO4-89-ISTD

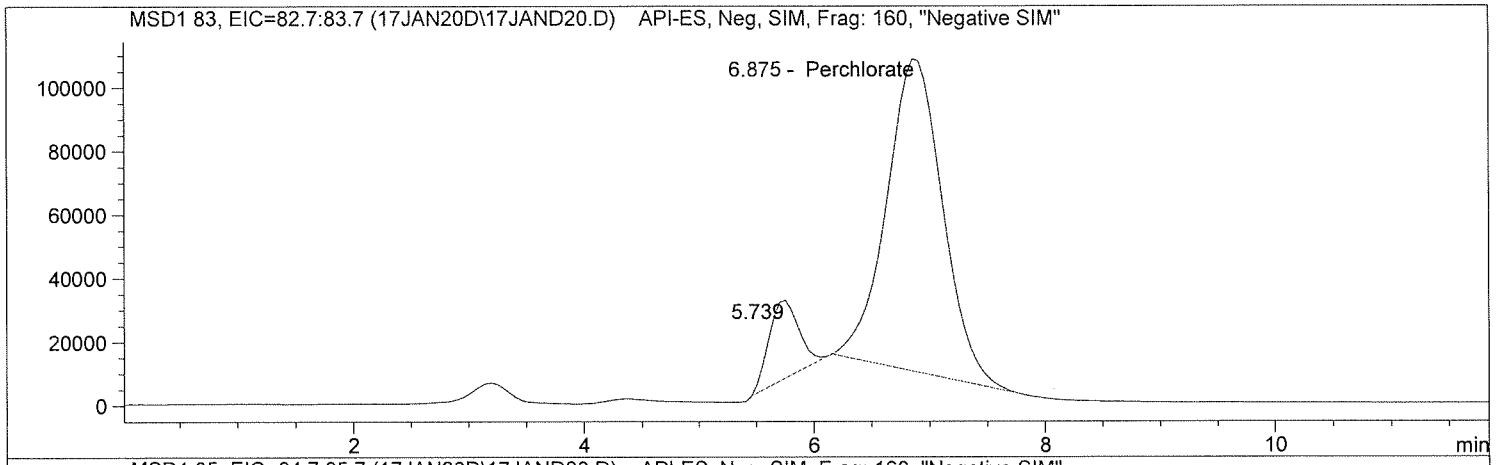
*** End of Report ***

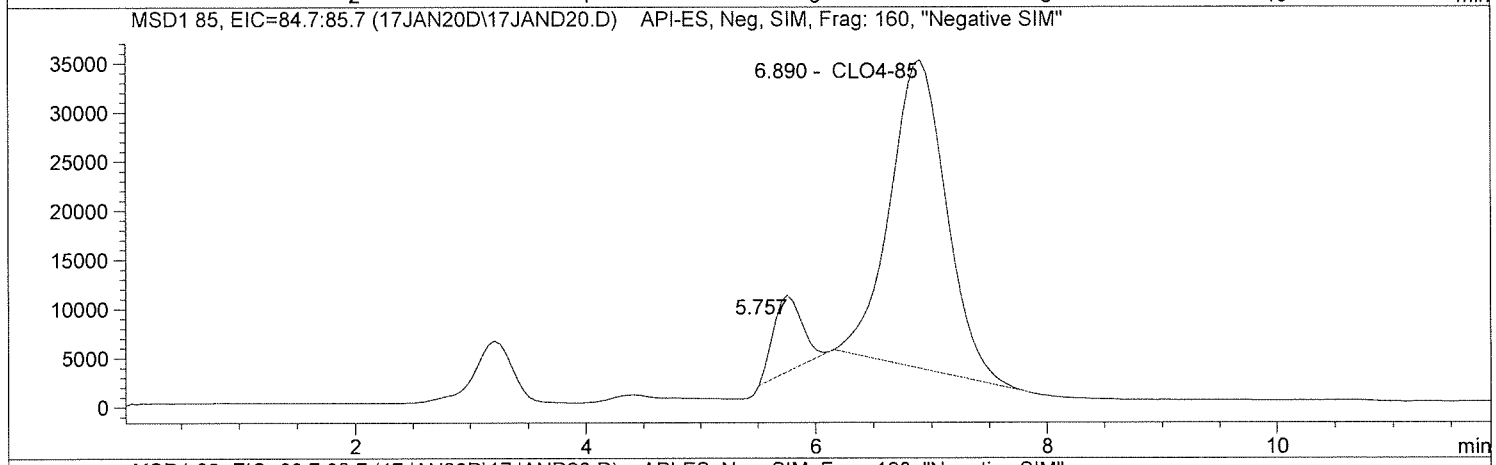
Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND20.D Sample Name: 2004548012

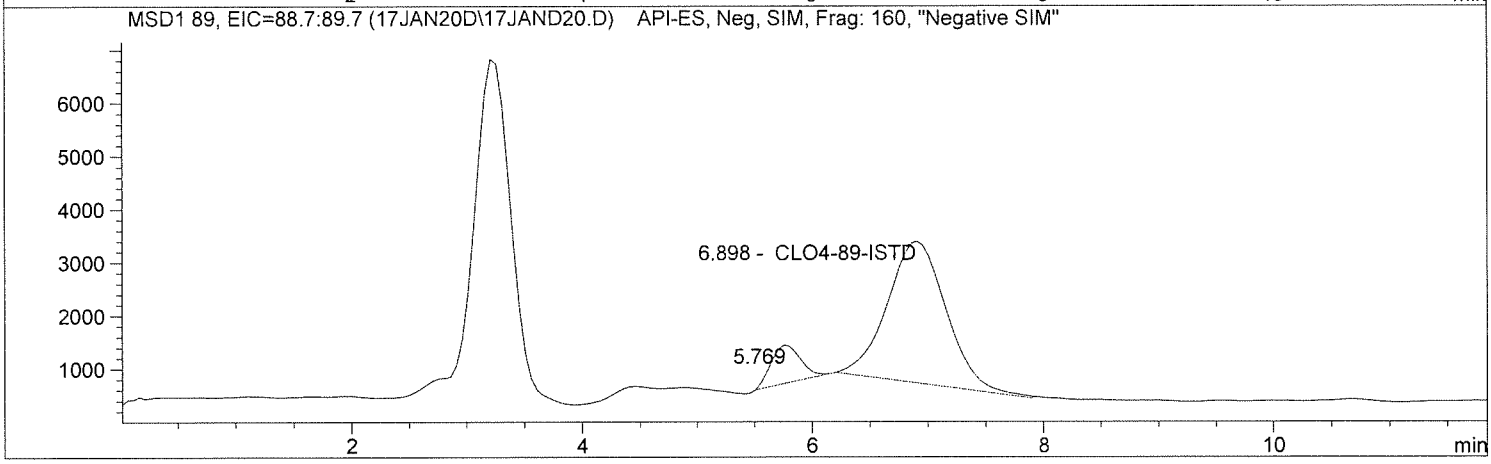
Injection Date:	2/17/2020 13:12:19	Seq Line:	20
Sample Name:	2004548012	Location:	Vial 89
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 2/17/2020 15:42:52

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND20.D Sample Name: 2004548012

Injection Date:	2/17/2020 13:12:19	Seq Line:	20
Sample Name:	2004548012	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: 2/17/2020 15:42:52

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
5.739	PB	449533.1	0.0000	
6.875	VBA	3313307.8	93.7006	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
5.757	PB	133767.0	0.0000	
6.890	VBA	1061136.6	98.5589	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
5.769	PB	12736.1	0.0000	
6.898	VBA	93711.6	5.0000	CLO4-89-ISTD

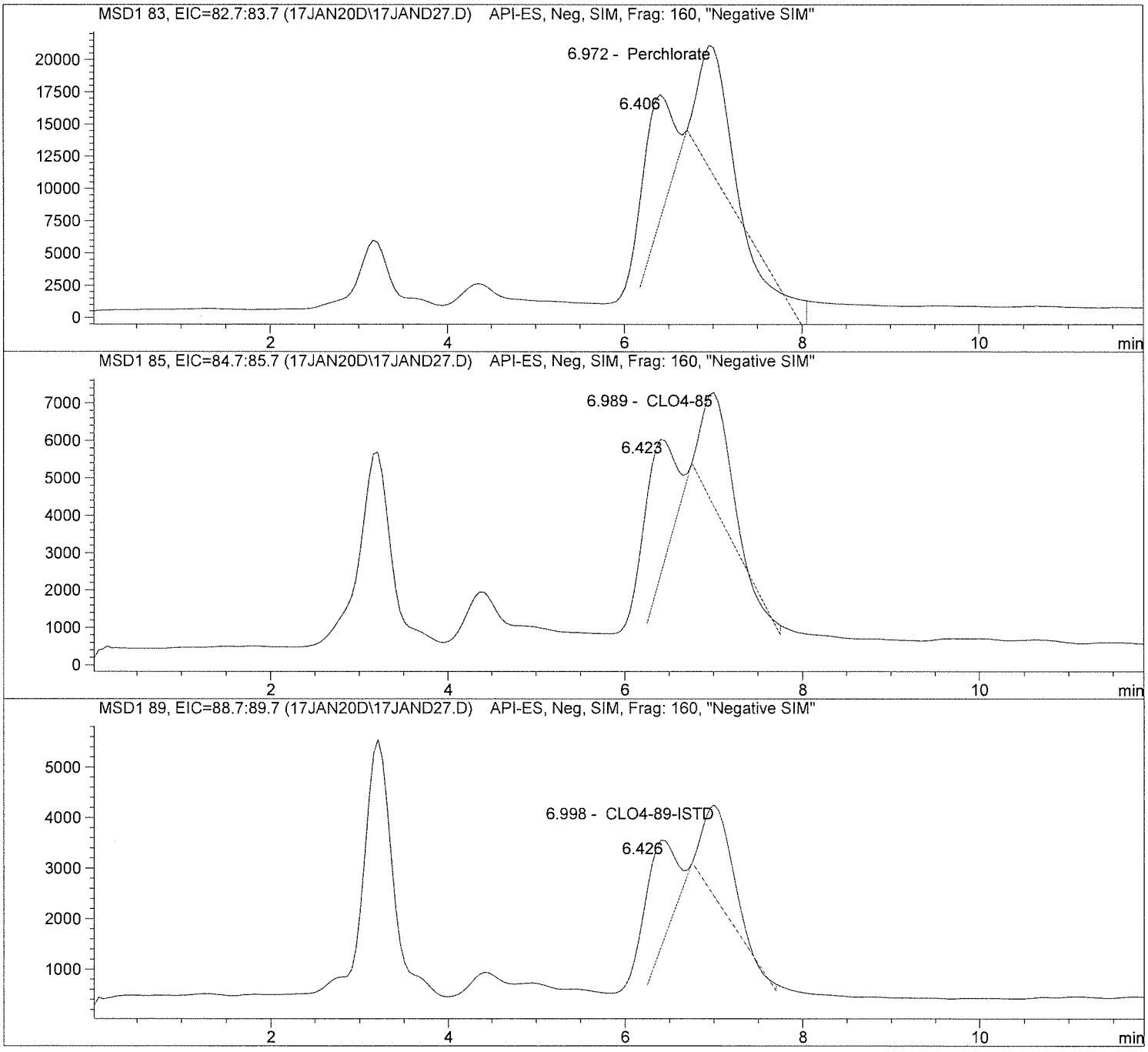
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND27.D Sample Name: 2004548008 RE

Injection Date:	2/17/2020 15:50:22	Seq Line:	27
Sample Name:	2004548008 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: 2/17/2020 15:42:52

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND27.D Sample Name: 2004548008 RE

Injection Date:	2/17/2020 15:50:22	Seq Line:	27
Sample Name:	2004548008 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: 2/17/2020 15:42:52

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
6.406	PB	201025.8	0.0000	
6.972	VBA	206483.3	17.6236	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.423	PB	66713.4	0.0000	
6.989	VBA	62789.6	17.5220	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.426	PB	39075.6	0.0000	
6.998	VBA	41273.5	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

February 20, 2020

Marcia Olive
Bhate Environmental Associates, Inc.
445 Union Blvd Ste 129
Lakewood, CO 80228

Work Order: **HS20020473**

Laboratory Results for: **Longhorn GW Treatment Plant Weekly Samples**

Dear Marcia,

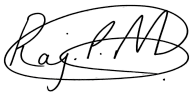
ALS Environmental received 2 sample(s) on Feb 12, 2020 for the analysis presented in the following report.

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: 20-Feb-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Weekly Samples
Work Order: HS20020473

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS20020473-01	LH18/24-SP650_021120	Water		11-Feb-2020 14:00	12-Feb-2020 09:05	☐
HS20020473-02	LH18/24-SP650_021120_BIX	Water		11-Feb-2020 14:00	12-Feb-2020 09:05	☐

ALS Houston, US Date: 20-Feb-20

Client: Bhate Environmental Associates, Inc. **CASE NARRATIVE**
Project: Longhorn GW Treatment Plant Weekly Samples
Work Order: HS20020473

Work Order Comments

- The analysis for Perchlorate was subcontracted to ALS Salt Lake City, UT. Final report attached.

  The analysis for TOC was subcontracted to ALS Kelso WA. Final report attached.

WetChemistry by Method E350.3

Batch ID: R356480

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

WetChemistry by Method E365.3

Batch ID: R356186

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

ALS Houston, US Date: 20-Feb-20

Client: Bhate Environmental Associates, Inc.
ANALYTICAL REPORT
Project: Longhorn GW Treatment Plant Weekly Samples
WorkOrder:HS20020473
Sample ID: LH18/24-SP650_021120
Lab ID:HS20020473-01
Collection Date: 11-Feb-2020 14:00
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
AMMONIA AS N BY E350.3(ISE)		**Method:E350.3**						Analyst: RG
Nitrogen, Ammonia (As N)	**3.6**	a	**0.20**	**0.10**	**0.20**	**mg/L**	1	18-Feb-2020 12:00
ORTHO PHOSPHATE (PO4) AS P BY E365.3		**Method:E365.3**						Analyst: MZD
Phosphorus, Total Orthophosphate (As P)	**0.970**	a	**0.100**	**0.250**	**0.250**	**mg/L**	10	12-Feb-2020 13:37
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	20-Feb-2020 18:08

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

ALS Houston, US Date: 20-Feb-20

Client:	Bhate Environmental Associates, Inc.	**ANALYTICAL REPORT**
Project:	Longhorn GW Treatment Plant Weekly Samples	WorkOrder:HS20020473
Sample ID:	LH18/24-SP650_021120_BIX	Lab ID:HS20020473-02
Collection Date:	11-Feb-2020 14:00	Matrix:Water

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	19-Feb-2020 09:28

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

ALS Houston, US Date: 20-Feb-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Weekly Samples
WorkOrder: HS20020473

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R356186 (0)	**Test Name :** ORTHO PHOSPHATE (PO4) AS P BY E365.3				**Matrix:** Water	
HS20020473-01	LH18/24-SP650_021120	11 Feb 2020 14:00			12 Feb 2020 13:37	10
Batch ID: R356480 (0)	**Test Name :** AMMONIA AS N BY E350.3(ISE)				**Matrix:** Water	
HS20020473-01	LH18/24-SP650_021120	11 Feb 2020 14:00			18 Feb 2020 12:00	1
Batch ID: R356523 (0)	**Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)				**Matrix:** Water	
HS20020473-02	LH18/24-SP650_021120_BIX	11 Feb 2020 14:00			19 Feb 2020 09:28	1
Batch ID: R356680 (0)	**Test Name :** SUBCONTRACT ANALYSIS - TOC ANALYSIS				**Matrix:** Water	
HS20020473-01	LH18/24-SP650_021120	11 Feb 2020 14:00			20 Feb 2020 18:08	1

ALS Houston, US Date: 20-Feb-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Weekly Samples
WorkOrder: HS20020473

QC BATCH REPORT

Batch ID: R356186 (0) **Instrument:** UV-2450 **Method:** ORTHO PHOSPHATE (PO4) AS P BY E365.3

MBLK Sample ID: **MBLK-356186** Units: **mg/L** Analysis Date: **12-Feb-2020 13:37**
Client ID: Run ID: **UV-2450_356186** SeqNo: **5470681** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total Orthophosphate (As P)	0.0250	0.0250								U

LCS Sample ID: **LCS-356186** Units: **mg/L** Analysis Date: **12-Feb-2020 13:37**
Client ID: Run ID: **UV-2450_356186** SeqNo: **5470682** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total Orthophosphate (As P)	0.223	0.0250	0.25	0	89.2	85 - 115				

MS Sample ID: **HS20020473-01MS** Units: **mg/L** Analysis Date: **12-Feb-2020 13:37**
Client ID: **LH18/24-SP650_021120** Run ID: **UV-2450_356186** SeqNo: **5470684** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total Orthophosphate (As P)	3.28	0.250	2.5	0.97	92.4	80 - 120				

MSD Sample ID: **HS20020473-01MSD** Units: **mg/L** Analysis Date: **12-Feb-2020 13:37**
Client ID: **LH18/24-SP650_021120** Run ID: **UV-2450_356186** SeqNo: **5470685** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total Orthophosphate (As P)	3.25	0.250	2.5	0.97	91.2	80 - 120	3.28	0.919	20	

The following samples were analyzed in this batch: HS20020473-01

ALS Houston, US Date: 20-Feb-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Weekly Samples
WorkOrder: HS20020473

QC BATCH REPORT

Batch ID: R356480 (0) **Instrument: WetChem_HS** **Method: AMMONIA AS N BY E350.3(ISE)**

MBLK Sample ID: **MBLK-R356480** Units: **mg/L** Analysis Date: **18-Feb-2020 12:00**
Client ID: Run ID: **WetChem_HS_356480** SeqNo: **5478648** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Ammonia (As N)	0.10	0.20								U

LCS Sample ID: **LCS-R356480** Units: **mg/L** Analysis Date: **18-Feb-2020 12:00**
Client ID: Run ID: **WetChem_HS_356480** SeqNo: **5478647** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Ammonia (As N)	10.2	0.20	10	0	102	80 - 120				

LCSD Sample ID: **LCSD-R356480** Units: **mg/L** Analysis Date: **18-Feb-2020 12:00**
Client ID: Run ID: **WetChem_HS_356480** SeqNo: **5478646** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Ammonia (As N)	10.18	0.20	10	0	102	80 - 120	10.2	0.157	20	

MS Sample ID: **HS20020436-01MS** Units: **mg/L** Analysis Date: **18-Feb-2020 12:00**
Client ID: Run ID: **WetChem_HS_356480** SeqNo: **5477188** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Ammonia (As N)	11.96	0.20	10	1.919	100	80 - 120				

MSD Sample ID: **HS20020436-01MSD** Units: **mg/L** Analysis Date: **18-Feb-2020 12:00**
Client ID: Run ID: **WetChem_HS_356480** SeqNo: **5477187** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Ammonia (As N)	12.24	0.20	10	1.919	103	80 - 120	11.96	2.32	20	

The following samples were analyzed in this batch: HS20020473-01

ALS Houston, US Date: 20-Feb-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Weekly Samples
WorkOrder: **HS20020473**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	19-028-0	27-Mar-2020
California	2919, 2019-2020	30-Apr-2020
Dept of Defense	ANAB L2231 V009	22-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	624-2020	31-Dec-2020
North Dakota	R-193 2019-2020	30-Apr-2020
Oklahoma	2019-067	31-Aug-2020
Texas	T104704231-19-25	30-Apr-2020

ALS Houston, US Date: 20-Feb-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Weekly Samples
Work Order: HS20020473

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS20020473-01	LH18/24-SP650_021120	Login	2/12/2020 11:04:29 AM	PMG	WET354
HS20020473-01	LH18/24-SP650_021120	Login	2/12/2020 11:04:29 AM	PMG	WET354
HS20020473-01	LH18/24-SP650_021120	Login	2/12/2020 11:04:29 AM	PMG	Sub
HS20020473-02	LH18/24-SP650_021120_BIX	Login	2/12/2020 11:04:29 AM	PMG	Sub

ALS Houston, US Date: 20-Feb-20

Sample Receipt Checklist

Client Name: Bhate Environmental
Work Order: HS20020473
Date/Time Received: **12-Feb-2020 09:05**
Received by: **AC**

Checklist completed by: *Paresh M. Giga* eSignature 12-Feb-2020 Date
Reviewed by: *RJ Modashia* eSignature 12-Feb-2020 Date

Matrices: **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):	0.9c U/C	IR25	
Cooler(s)/Kit(s):	45571		
Date/Time sample(s) sent to storage:	2/12/2020 11:15		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

CHAIN OF CUSTODY

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

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

Project No. NWO1312.0150.0 16.0001

Job: GROUNDWATER TREATMENT PLANT WEEKLY SAMPLES

Prepared By: Scott Beesinger

P.O. Number

HS20020473
Bhate Environmental Associates, Inc.
Longhorn GW Treatment Plant Weekly Samples

Field Sample I.D.	Sample Matrix	Date / Time	MS / MSD	No. OF CONTAINERS	Analyses: AMMONIA-N	TOTAL ORGANIC CARBON	ORTHO-PHOSPHATE	PERCHLORATE							Remarks (Preservatives, etc.)	Lab I.D.#
LH18/24-SP650_021120	Water	02/11/20 / 14:00		3	X	X									H2SO4	
LH18/24-SP650_021120	Water	02/11/20 / 14:00		1			X								NONE	
LH18/24–SP650_021120_BIX	Water	02/11/20 / 14:00		1				X							NONE	

Additional Remarks: **Standard TAT on all parameters**

Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
Scott Beesinger	02/11/20	14:30	AC	2/12/2020	09:05						

For Lab Use Only

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

Remarks: u/c 0.9 IR#25 CF0.0 45571

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

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

45571

CUSTODY SEAL

Date: 2/11/20 Time: 1430
Name: Scott Beesinger
Company: BHATE

Seal Broken By: SM
Date: 02/12/20

45571

Must Deliver Next Business
Time and Tempature Sensitive!

45571

ORIGIN ID:SGRA (303) 597-2450
SCOTT BEESINGER
BHATE ENVIRONMENTAL ASSOCIATES
1203-B EAST GRAND AVE.
PMB202
MARSHALL, TX 75670
UNITED STATES US

SHIP DATE: 09JAN20
ACTWGT: 1.00 LB MAN
CAD: 3001307CAFE3211
DIMS: 19x16x13 IN

TO CLIENT SERVICES
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON TX 77099
(281) 530-5656
REF: LONGHORN - RJ

RMA:

FedEx Express

FedEx
TRK# 0221 1251 0293 5906

WED - 12 FEB 10:30A
PRIORITY OVERNIGHT

AB SGRA

77099
TX-US
IAH

FTD 1079314 11FEB20 GGGA 56AC2/049E/05A2

Case Narrative

Method: 6850
Analysis: Perchlorate
Analysis SOP: LC-MS-CLO4
ALS WO ID(s): 2004545; 2004546; 2004547; 2004548

Client: ALS Laboratories (Houston, TX)
Matrix: Water
ELMS Batch (HBN): 2350 (257242)

General Set Information: There were nineteen 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. 50µL 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 0.45µm Syringe filters.

Holding Times: Holding times were met for all analyses.

Dilutions: Field sample 2004545001 was analyzed and reported from a 1:1,000 dilution. Field sample 2004548012 was re-analyzed and reported from a 1:10 dilution. The reporting limits have been adjusted accordingly.

Method QC data: The method blank (LMB 695966) was less than 1/2 the CRDL. The recovery for the LCS (695963) was within acceptable parameters.

MS/MSD Analysis: MS/MSD was performed on samples 2004548015/16 (Client ID: 04WW11-200204). 3.0µL of Working Standard Solution Horizon ID 49947 was added to 10.0mL of sample preparation. The spike target was 3.µg/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 µg/L. Results were calculated in µg/L by the equation (A)x(B),

where: A = Analyte concentration from the standard curve (µg/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 – 695964) is reported from the analysis of the Laboratory Control Sample (LCS – 695963) at a level of 3.0µg/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 17JAND16/20/27. Field sample 2004548008 was re-analyzed at a 1:5 dilution and undiluted to confirm the positive result and split peak chromatography.

Thomas Bosch February 18, 2020
Analyst Date

ANALYTICAL REPORT

Report Date: February 18, 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: **34-2004547**
Project ID: HS20020473
Purchase Order: HS20020473
Project Manager Kevin W. Griffiths

Client Sample ID	Lab ID	Collect Date	Receive Date	Sampling Site
LH18/24-SP650_021120_BIX Water	2004547001	02/11/20	02/13/20	HS20020473-02

ANALYTICAL REPORT

Workorder: 34-2004547
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: **LH18/24-SP650_021120_BIX Water**
Lab ID: 2004547001
Matrix: Water

Sampling Site: HS20020473-02
Media: 125 mL Nalgene
Sampling Parameter: NA

Collected: 02/11/2020
Received: 02/13/2020

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable

Analysis: EPA 6850, DoD QSM Water
Batch: ELMS/2350 (HBN: 257242)
Analyzed: 02/17/2020 10:11

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

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 02/18/2020 09:40	/S/ Stephen Brose 02/18/2020 13:55

Laboratory Contact Information

ALS Environmental
960 W Levoy Drive
Salt Lake City, Utah 84123

Phone: (801) 266-7700
Email: alslt.lab@ALSGlobal.com
Web: www.alsslc.com

ANALYTICAL REPORT

Workorder: 34-2004547
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.
The following was provided by the client: Sample ID, Collection Date, Sampling Location, Media Type, Sampling Parameter.
Collection Date, Media Type, and Sampling Parameter can potentially affect the validity of the results.
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

Analysis Information

Workorder: 2004547

Limits:	Client SOW/Contract Specified	**Preparation:**	NA	**Analysis:**	EPA 6850, DoD QSM
Basis:	DoD QSM	**Batch:**	NA	**Batch:**	ELMS/2350 (HBN: 257242)
		Prepared By:	NA	**Analyzed By:**	Thomas Bosch

Blank

LMB: 695966
Analyzed: 02/17/2020 09:30
Units: ug/L

Analyte	Result	MDL	RL
Perchlorate	ND	1	2.00

Laboratory Control Sample

LCS: 695963
Analyzed: 02/17/2020 09:02
Dilution: 1
Units: ug/L

Analyte	Result	Target	% Rec	QC Limits	
Perchlorate	2.99	3.00	99.8	78.8	123.8

Matrix Spike - Matrix Spike Duplicate

Sample: 2004548009	**MS:** 2004548015	**MSD:** 2004548016
Analyzed: 02/17/2020 12:30	**Analyzed:** 02/17/2020 14:54	**Analyzed:** 02/17/2020 15:08
Dilution: 1	**Dilution:** 1	**Dilution:** 1
Units: ug/L	**Units:** ug/L	**Units:** ug/L

Analyte	Result	Result	Target	% Rec	QC Limits		Result	% Rec	RPD	QC Limits	
Perchlorate	ND	3.2	3	107	78.8	123.8	3.1	105	3.17	0.0	20.0

QC Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Analyst	Peer Review
/S/ Thomas Bosch	/S/ Stephen Brose
02/18/2020 09:45	02/18/2020 13:55

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



2004547

10450 Stancliff Rd, Ste 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

2004547

Subcontract Chain of Custody

18698/#2

SAMPLING STATE: **Dept of Defense** **COC ID:** **13319**

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:	
Email:	

INVOICE INFORMATION:

Company:	ALS Houston
Contact:	Accounts Payable
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Reference:	HS20020473
TSR:	Danielle Winnings

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS20020473-02**	**LH18/24-SP650_021120_BIX**	**Water**	**11 Feb 2020 14:00**
	SUB_Perch-6850			20 Feb 2020

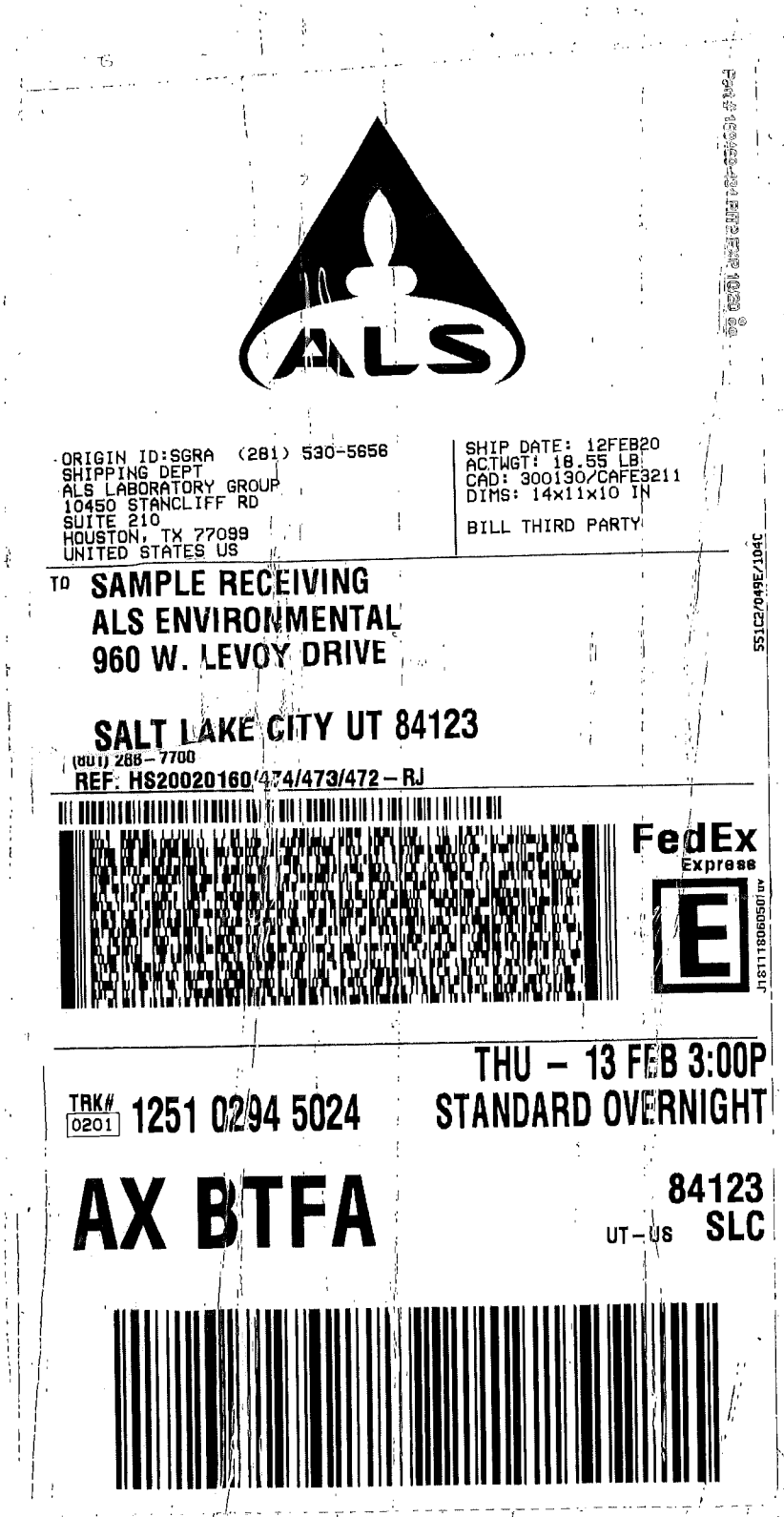
Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.

QC Level: DOD IV (DoD Data Package)

Relinquished By: NA Date/Time: 2.12.20 18:00

Received By: Date/Time: 02-13-20 9:46

Cooler ID(s): Temperature(s):



ORIGIN ID:SGRA (281) 530-5656
SHIPPING DEPT
ALS LABORATORY GROUP
10450 STANCLIFF RD
SUITE 210
HOUSTON, TX 77099
UNITED STATES US

SHIP DATE: 12FEB20
ACTWGT: 18.55 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) 266-7700
REF: HS20020160/474/473/472-RJ

FedEx Express

THU - 13 FEB 3:00P
STANDARD OVERNIGHT

TRK# 0201 1251 0294 5024

AX BTFA

84123
UT-US SLC

551C2/049E/104C

J18111806050U

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: 02-13-20 9:46

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	Good	2 °C	4		°C	7		°C
2		°C	5		°C	8		°C
3		°C	6		°C	9		°C

Taken By: [signature] (Signature) T. Vantassell (Printed Name) 02-13-20 (Date)

CLIENT-RELATED INFORMATION

☐ Missing Cooler	☐ Missing Samples/Bottles	☐ Incorrect Preservation	☐ Insufficient Sample Volume
☐ Cooler Conditions	☐ Broken/Leaking Samples	☐ pH Criteria Not Met	☐ Chain of Custody Problems
☐ Missing Paperwork	☐ Incorrect Bottle Type	☐ Residual Chlorine Present	☐ Other:
☐ Missing/Incorrect Bottle Labels	☐ Cooler Temperatures Out of Range	☐ 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: _____ (Printed Name) Returned to Sample Receipt by: _____ (Signature) Date: _____

00969479

ALS Environmental

CHAIN-OF-CUSTODY

Project / Job / Task: HS20020473-02	***Split:***	**Workorder ID:** 2004547	**Level:** ENV_LVL4
Client: ALS Environmental (Houston)		**Account:** 8101	**Type:** 125Poly
Comments:			**Preservatives**

Item	Collect Date/Time	Sample ID	Lab ID	QC	Matrix	Containers ID(s)	Containers Count	Requested Analysis: EPA 6850, DoD QSM
1	02/11/2020 14:00	LH18/24-SP650_021120_BIX Water	2004547001		Water	A	1	A

COOL

24 of 170

ORIGINAL FIELD SAMPLE CHAIN-OF-CUSTODY

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location
VanTassell, Tami	02/13/2020 09:46	ALS Sample Receiving	Sample Login
Tami VanTassell R.33.1	02-13-20 15:30 02.14.20/12:25	15C T. Rosch	Storage CLOA analysis

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

Batch Worklist

Batch: ELMS/ 2350
Rule: EPA 6850, DoD QSM Water

Created: 2/17/2020 07:43
Analyst: T. Bosch

Instrument:
Status: WP

HBN: 257242

Workorder: 2004545 [ENV_LVL4]
Workorder: 2004546 [ENV_LVL4]
Workorder: 2004547 [ENV_LVL4]
Workorder: 2004548 [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	695962	CCV for HBN 257242 [ELMS/2350]				CCV	3		E685041C3Q	5311		2/26/2020	
2	695963	LCS for HBN 257242 [ELMS/2350]				LCS	3		E6850Q413Q	5311		2/26/2020	
3	695964	RLVS for HBN 257242 [ELMS/2350				RLVS	3		E685041C3Q	5311		2/26/2020	
4	695965	ICS for HBN 257242 [ELMS/2350]				ICS	3		E6850..D3Q	5311		2/26/2020	
5	695966	LMB for HBN 257242 [ELMS/2350]				LMB	3		E6850Q413Q	5311		2/26/2020	
6	2004545001	LH18/24-SP140_021120				SAMPLE	3	2004545001-A	E6850Q41.3	5480	3/10/2020	2/26/2020	
7	2004546001	LH18/24-SP650_021120_BIX Water				SAMPLE	3	2004546001-A	E6850Q41.3	5480	3/10/2020	2/26/2020	
8	2004547001	LH18/24-SP650_021120_BIX Water				SAMPLE	3	2004547001-A	E6850Q41.3	5480	3/10/2020	2/26/2020	
9	2004548001	LHSMW01-200203				SAMPLE	3	2004548001-A	E6850Q41.3	5480	3/2/2020	2/26/2020	
10	2004548002	04WW08-200203				SAMPLE	3	2004548002-A	E6850Q41.3	5480	3/2/2020	2/26/2020	
11	2004548003	04WW04-200203				SAMPLE	3	2004548003-A	E6850Q41.3	5480	3/2/2020	2/26/2020	
12	2004548004	04WW06-200203				SAMPLE	3	2004548004-A	E6850Q41.3	5480	3/2/2020	2/26/2020	
13	2004548005	LHSMW02-200203				SAMPLE	3	2004548005-A	E6850Q41.3	5480	3/2/2020	2/26/2020	
14	2004548006	LHSMW02-200203-FD				SAMPLE	3	2004548006-A	E6850Q41.3	5480	3/2/2020	2/26/2020	
15	2004548007	04WW02-200203				SAMPLE	3	2004548007-A	E6850Q41.3	5480	3/2/2020	2/26/2020	
16	695967	CCV for HBN 257242 [ELMS/2350]				CCV	3		E685041C3Q	5311		2/26/2020	
17	2004548008	04WW01-200204				SAMPLE	3	2004548008-A	E6850Q41.3	5480	3/3/2020	2/26/2020	
18	2004548009	04WW11-200204				SAMPLE	3	2004548009-A	E6850Q41.3	5480	3/3/2020	2/26/2020	
19	2004548010	04WW05-200204				SAMPLE	3	2004548010-A	E6850Q41.3	5480	3/3/2020	2/26/2020	
20	2004548011	04WW10-200204				SAMPLE	3	2004548011-A	E6850Q41.3	5480	3/3/2020	2/26/2020	
21	2004548012	04WW07-200204				SAMPLE	3	2004548012-A	E6850Q41.3	5480	3/3/2020	2/26/2020	
22	2004548013	04WW09-200204				SAMPLE	3	2004548013-A	E6850Q41.3	5480	3/3/2020	2/26/2020	
23	2004548014	04WW09-200204-FD				SAMPLE	3	2004548014-A	E6850Q41.3	5480	3/3/2020	2/26/2020	
24	2004548015	04WW11-200204 MS				MS	3	2004548015-A	E6850Q41.3	5480	3/3/2020	2/26/2020	
25	2004548016	04WW11-200204 MSD				MSD	3	2004548016-A	E6850Q41.3	5480	3/3/2020	2/26/2020	
26	695968	CCV for HBN 257242 [ELMS/2350]				CCV	3		E685041C3Q	5311		2/26/2020	

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Batch Worklist

Pos	Lab ID	Sample ID	Prep Initial	Prep Final	Dust Weight	Type	Mx	Container	Procedure	Mgr	Expire Date	Due Date	Run Date
27	696082	CCV for HBN 257242 [ELMS/2350]				CCV	3		E685041C3Q	5311		2/26/2020	

00969481

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Analytical Documentation

Analyst Write-up

ALS Work Order #'s & Sample #( )'s: 2004545 (001); 2004546 (001); 2004547 (001); 2004548 (001-16)
ELMS Batch/HBN ID: 2350 (256242)
Prep Date: 02/14/2020 Analysis Date: 02/17/2020 Analyst: Tom Bosch
Analyte: **Perchlorate** Matrix: **Water** Method: **6850**
Sequence: \\HPCHEM\1\SEQUENCE\CLO4\2020\FEB\17FEB20D.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 695963; Target = 3.0µg/L. ASTM type II water was used for LMB 695966.

MS/MSD: The Matrix Spike and duplicate (MS/MSD) was performed on samples 2004548015/16 (Client ID: 04WW11-200204). 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 2004545001 was analyzed and reported from a 1:1,000 dilution. Field sample 2004548012 was re-analyzed and reported from a 1:10 dilution. The reporting limits have been adjusted accordingly. Field sample 2004548008 was re-analyzed at a 1:5 dilution and undiluted to confirm the positive result and split peak chromatography.
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\2020\FEB\HBN# or through NuGenesis\Tree\PrintData\LCMS\DefaultView.
4) Notebook: \\alsltws013\ORGANIC\BOSCH\LCMS\Perchlorates\Waters\2020\DOD\256242-DoD-ALS-Hstn LCMS4 or through \\ALSLTWS013\DATAREVIEW\HBN#
5) The Reporting Limit Verification Standard (RLVS – 695964) is reported from the analysis of the Laboratory Control Sample (LCS – 695963) 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 17JAND16/20/27.

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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 **Batch(es)/SDG:** ELMS: 23350 HBN: 257242 **Sample Set IDs if Applicable:** 2004545/2004546/2004547/2004548	**Analyst Initials**	**Reviewer Initials**
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
MFG: ALS/SLC
MFG Lot: TNB: 05/06/2019
Pipette ID: Not Provided
Created By: Thomas Bosch
Create Date: 05/06/2019 03:05PM
Amount: 10 mL
Expires: 03/31/2020
Usable: Yes
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

S 43659

AccuTrace™ Reference Standard

Catalog No: IC-PER-10X-1
Description: Perchlorate Standard
Element: Perchlorate (ClO_4)
SRM: Ind. Std.
Lot: 218065075
Matrix: Water
Hazards: *Refer to SDS for complete safety information*

Signal Word: None

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

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

ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

ISO Guide 34 Reference Material

Product Number: ICC-013
Lot Number: CP-0860

S 36748

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.

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER
ANAB ACCREDITED ACCREDITED TESTING LABORATORY

ISO 9001 Registered Quality System – TUV USA

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ULTRA SCIENTIFIC
Analytical Solutions

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

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

ANAB ACCREDITED ISO/IEC 17025 TESTING LABORATORY

ISO 9001 Registered Quality System – TUV USA

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Cambridge Isotope Laboratories, Inc.

Certificate of Analysis

S 47863

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:	≥ 98%
MW*: ** For isotopically labeled compounds, MW listed is for the fully enriched product.*	130.44
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.

$NaCl^{18}O_4$

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 ± 1.0 µg/mL (k=2)
Chemical Purity of Neat Material(s)	98%
LC/MS for Concentration	105.4 ± 1.1 µg/mL (k=2)



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

00969500

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
*	695962 CCV@25	Vial 71	1	Control	1	1.92768e6	7.930	24.86639
*	695963 LCS@3.	Vial 72	1	Control	2	2.01219e5	7.529	2.99456
*	695964 ICS@3.0	Vial 73	1	Control	3	1.44924e5	7.156	2.76338
*	695966 LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
*	2004545001 100	Vial 75	1	Sample	5	9.91954e6	7.281	1.06828e4
*	2004546001	Vial 76	1	Sample	6	0.00000	0.000	0.00000
*	2004547001	Vial 77	1	Sample	7	0.00000	0.000	0.00000
*	2004548001	Vial 78	1	Sample	8	0.00000	0.000	0.00000
*	2004548002	Vial 79	1	Sample	9	0.00000	0.000	0.00000
*	2004548003	Vial 80	1	Sample	10	0.00000	0.000	0.00000
*	2004548004	Vial 81	1	Sample	11	0.00000	0.000	0.00000
*	2004548005	Vial 82	1	Sample	12	0.00000	0.000	0.00000
*	2004548006	Vial 83	1	Sample	13	0.00000	0.000	0.00000
*	2004548007	Vial 84	1	Sample	14	0.00000	0.000	0.00000
*	695967 CCV@25	Vial 71	1	Control	15	1.72959e6	7.246	25.26416
*	2004548008	Vial 85	1	Sample	16	7.48879e5	7.008	18.97843
*	2004548009	Vial 86	1	Sample	17	0.00000	0.000	0.00000
*	2004548010	Vial 87	1	Sample	18	0.00000	0.000	0.00000
*	2004548011	Vial 88	1	Sample	19	0.00000	0.000	0.00000
*	2004548012	Vial 89	1	Sample	20	4.27720e6	6.875	94.65050
*	2004548013	Vial 90	1	Sample	21	1.18569e6	6.905	17.51257
*	2004548014	Vial 91	1	Sample	22	1.20862e6	6.879	21.88966
*	2004548015 MS	Vial 92	1	Sample	23	2.05915e5	6.973	3.19687
*	2004548016 MSD	Vial 93	1	Sample	24	1.99352e5	7.026	3.13852
*	2004545001 1K	Vial 94	1	Sample	25	6.98274e5	7.287	1.06347e4
*	695968 CCV@25	Vial 71	1	Control	26	1.54321e6	7.193	25.75234
*	2004548008 RE	Vial 85	1	Sample	27	6.97532e5	6.972	18.60668
*	2004548012 10X	Vial 95	1	Sample	28	5.64190e5	7.108	86.45192
*	2004548008 5X	Vial 96	1	Sample	29	2.64237e5	7.093	17.29449
*	696082 CCV@25	Vial 71	1	Control	30	1.61866e6	7.208	26.26917

TB 2.18.20

N.R. – NOT REPORTED (RERUN + DILUTION) TB 2.18.20

#	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
*	695962 CCV@25	Vial 71	1	Control	1	2.65029e5	7.950	5.00000
*	695963 LCS@3.	Vial 72	1	Control	2	2.47234e5	7.555	5.00000
*	695964 ICS@3.0	Vial 73	1	Control	3	1.92731e5	7.177	5.00000
*	695966 LMB	Vial 74	1	Control	4	2.29809e5	7.346	5.00000
*	2004545001 100	Vial 75	1	Sample	5	2.35908e5	7.306	500.00000
*	2004546001	Vial 76	1	Sample	6	2.19401e5	7.052	5.00000
*	2004547001	Vial 77	1	Sample	7	2.15048e5	7.060	5.00000
*	2004548001	Vial 78	1	Sample	8	2.54205e5	7.021	5.00000
*	2004548002	Vial 79	1	Sample	9	1.96395e5	6.630	5.00000
*	2004548003	Vial 80	1	Sample	10	2.66482e5	7.157	5.00000
*	2004548004	Vial 81	1	Sample	11	2.45154e5	7.031	5.00000
*	2004548005	Vial 82	1	Sample	12	2.58211e5	6.986	5.00000
*	2004548006	Vial 83	1	Sample	13	2.44279e5	6.981	5.00000
*	2004548007	Vial 84	1	Sample	14	2.65820e5	7.133	5.00000
*	695967 CCV@25	Vial 71	1	Control	15	2.33668e5	7.257	5.00000
*	2004548008	Vial 85	1	Sample	16	1.38230e5	7.032	5.00000
*	2004548009	Vial 86	1	Sample	17	2.27262e5	6.903	5.00000
*	2004548010	Vial 87	1	Sample	18	2.50415e5	6.920	5.00000
*	2004548011	Vial 88	1	Sample	19	2.67412e5	6.947	5.00000
*	2004548012	Vial 89	1	Sample	20	1.19387e5	6.898	5.00000
*	2004548013	Vial 90	1	Sample	21	2.38618e5	6.920	5.00000
*	2004548014	Vial 91	1	Sample	22	1.91102e5	6.901	5.00000
*	2004548015 MS	Vial 92	1	Sample	23	2.37178e5	7.001	5.00000

Batch Report: C:\HPCHEM\1\DATA\17JAN20D\17FEB20S.B

#*	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
*	2004548016 MSD	Vial 93	1	Sample	24	2.33840e5	7.035	5.00000
*	2004545001 1K	Vial 94	1	Sample	25	2.37891e5	7.310	5000.00000
*	695968 CCV@25	Vial 71	1	Control	26	2.04125e5	7.215	5.00000
*	2004548008 RE	Vial 85	1	Sample	27	1.31527e5	6.998	5.00000
*	2004548012 10X	Vial 95	1	Sample	28	2.38166e5	7.128	50.00000
*	2004548008 5X	Vial 96	1	Sample	29	2.81500e5	7.121	25.00000
*	696082 CCV@25	Vial 71	1	Control	30	2.09447e5	7.223	5.00000

#*	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
*	695962 CCV@25	Vial 71	1	Control	1	5.76713e5	7.946	24.43478
*	695963 LCS@3.	Vial 72	1	Control	2	6.49552e4	7.544	3.08073
*	695964 ICS@3.0	Vial 73	1	Control	3	4.99792e4	7.163	3.03921
*	695966 LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
*	2004545001 100	Vial 75	1	Sample	5	2.92982e6	7.295	1.05759e4
*	2004546001	Vial 76	1	Sample	6	0.00000	0.000	0.00000
*	2004547001	Vial 77	1	Sample	7	0.00000	0.000	0.00000
*	2004548001	Vial 78	1	Sample	8	0.00000	0.000	0.00000
*	2004548002	Vial 79	1	Sample	9	0.00000	0.000	0.00000
*	2004548003	Vial 80	1	Sample	10	0.00000	0.000	0.00000
*	2004548004	Vial 81	1	Sample	11	0.00000	0.000	0.00000
*	2004548005	Vial 82	1	Sample	12	0.00000	0.000	0.00000
*	2004548006	Vial 83	1	Sample	13	0.00000	0.000	0.00000
*	2004548007	Vial 84	1	Sample	14	0.00000	0.000	0.00000
*	695967 CCV@25	Vial 71	1	Control	15	5.12273e5	7.259	24.60220
*	2004548008	Vial 85	1	Sample	16	2.46751e5	7.031	20.35009
*	2004548009	Vial 86	1	Sample	17	0.00000	0.000	0.00000
*	2004548010	Vial 87	1	Sample	18	0.00000	0.000	0.00000
*	2004548011	Vial 88	1	Sample	19	0.00000	0.000	0.00000
*	2004548012	Vial 89	1	Sample	20	1.38274e6	6.890	100.27945
*	2004548013	Vial 90	1	Sample	21	3.97137e5	6.920	19.06294
*	2004548014	Vial 91	1	Sample	22	4.02089e5	6.893	23.69193
*	2004548015 MS	Vial 92	1	Sample	23	7.45778e4	6.989	3.70934
*	2004548016 MSD	Vial 93	1	Sample	24	7.01320e4	7.029	3.53314
*	2004545001 1K	Vial 94	1	Sample	25	2.11343e5	7.302	1.04716e4
*	695968 CCV@25	Vial 71	1	Control	26	4.53507e5	7.209	24.90409
*	2004548008 RE	Vial 85	1	Sample	27	2.26847e5	6.989	19.70833
*	2004548012 10X	Vial 95	1	Sample	28	1.80717e5	7.130	89.77314
*	2004548008 5X	Vial 96	1	Sample	29	8.81854e4	7.119	18.47589
*	696082 CCV@25	Vial 71	1	Control	30	4.74563e5	7.222	25.35553

*** End of Report ***

Sequence Table:

Method and Injection Info Part:

Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
1	Vial 71	695962 CCV@25	CLO4-AQN	1	Ctrl Samp		
2	Vial 72	695963 LCS@3.	CLO4-AQN	1	Ctrl Samp		
3	Vial 73	695964 ICS@3.0	CLO4-AQN	1	Ctrl Samp		
4	Vial 74	695966 LMB	CLO4-AQN	1	Ctrl Samp		
5	Vial 75	2004545001 100	CLO4-AQN	1	Sample		
6	Vial 76	2004546001	CLO4-AQN	1	Sample		
7	Vial 77	2004547001	CLO4-AQN	1	Sample		
8	Vial 78	2004548001	CLO4-AQN	1	Sample		
9	Vial 79	2004548002	CLO4-AQN	1	Sample		
10	Vial 80	2004548003	CLO4-AQN	1	Sample		
11	Vial 81	2004548004	CLO4-AQN	1	Sample		
12	Vial 82	2004548005	CLO4-AQN	1	Sample		
13	Vial 83	2004548006	CLO4-AQN	1	Sample		
14	Vial 84	2004548007	CLO4-AQN	1	Sample		
15	Vial 71	695967 CCV@25	CLO4-AQN	1	Ctrl Samp		
16	Vial 85	2004548008	CLO4-AQN	1	Sample		
17	Vial 86	2004548009	CLO4-AQN	1	Sample		
18	Vial 87	2004548010	CLO4-AQN	1	Sample		
19	Vial 88	2004548011	CLO4-AQN	1	Sample		
20	Vial 89	2004548012	CLO4-AQN	1	Sample		
21	Vial 90	2004548013	CLO4-AQN	1	Sample		
22	Vial 91	2004548014	CLO4-AQN	1	Sample		
23	Vial 92	2004548015 MS	CLO4-AQN	1	Sample		
24	Vial 93	2004548016 MSD	CLO4-AQN	1	Sample		
25	Vial 94	2004545001 1K	CLO4-AQN	1	Sample		
26	Vial 71	695968 CCV@25	CLO4-AQN	1	Ctrl Samp		
27	Vial 85	2004548008 RE	CLO4-AQN	1	Sample		
28	Vial 95	2004548012 10X	CLO4-AQN	1	Sample		
29	Vial 96	2004548008 5X	CLO4-AQN	1	Sample		
30	Vial 71	696082 CCV@25	CLO4-AQN	1	Ctrl Samp		

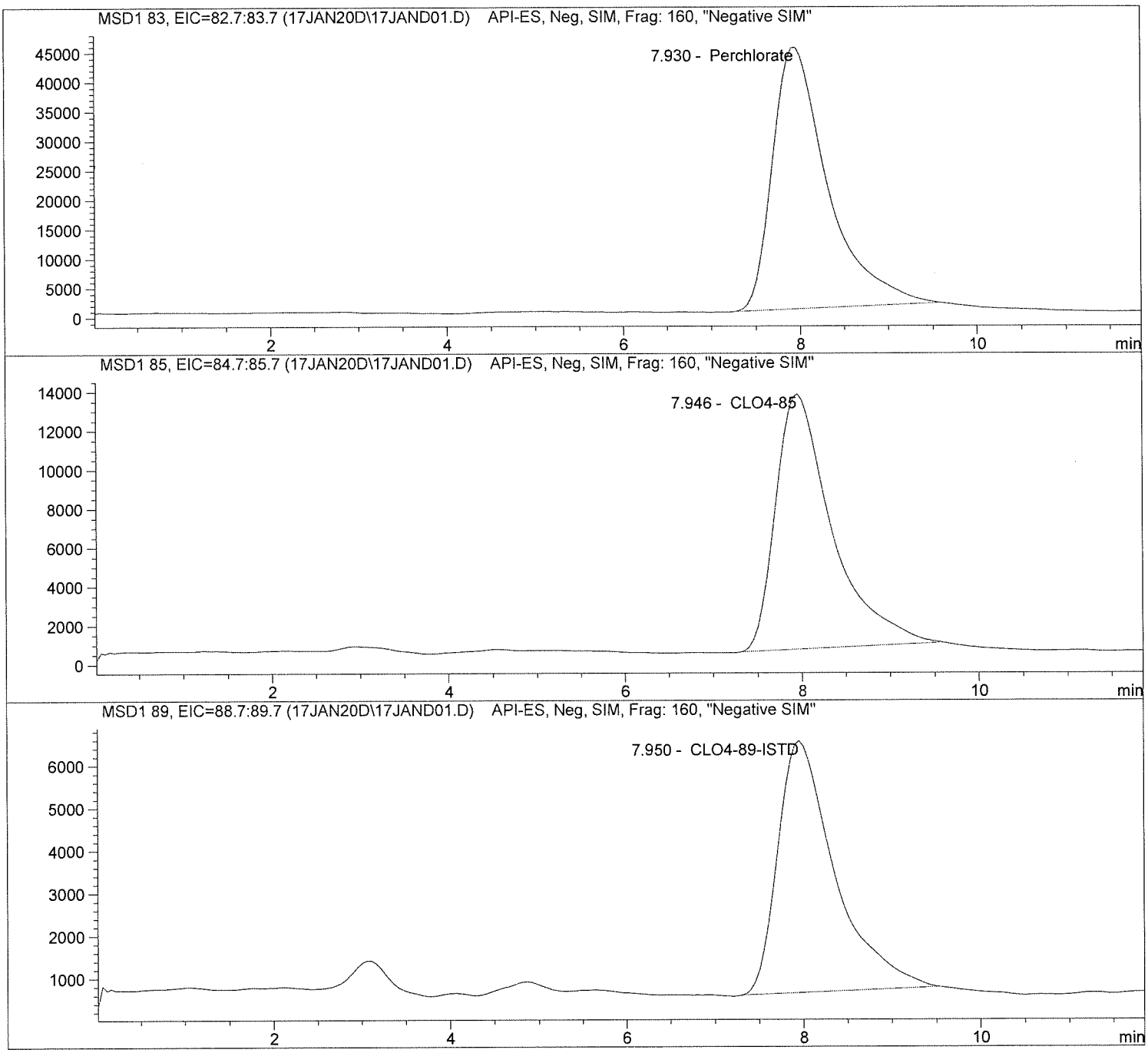
TB 2.18.20

Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND01.D Sample Name: 695962 CCV@25

Injection Date:	2/17/2020 08:48:29	Seq Line:	1
Sample Name:	695962 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: 2/17/2020 15:42:52

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND01.D Sample Name: 695962 CCV@25

Injection Date:	2/17/2020 08:48:29	Seq Line:	1
Sample Name:	695962 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:	2/17/2020 15:42:52

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
7.930	PBA	1927676.2	24.8664	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.946	PBA	576713.4	24.4348	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.950	PBA	265029.5	5.0000	CLO4-89-ISTD

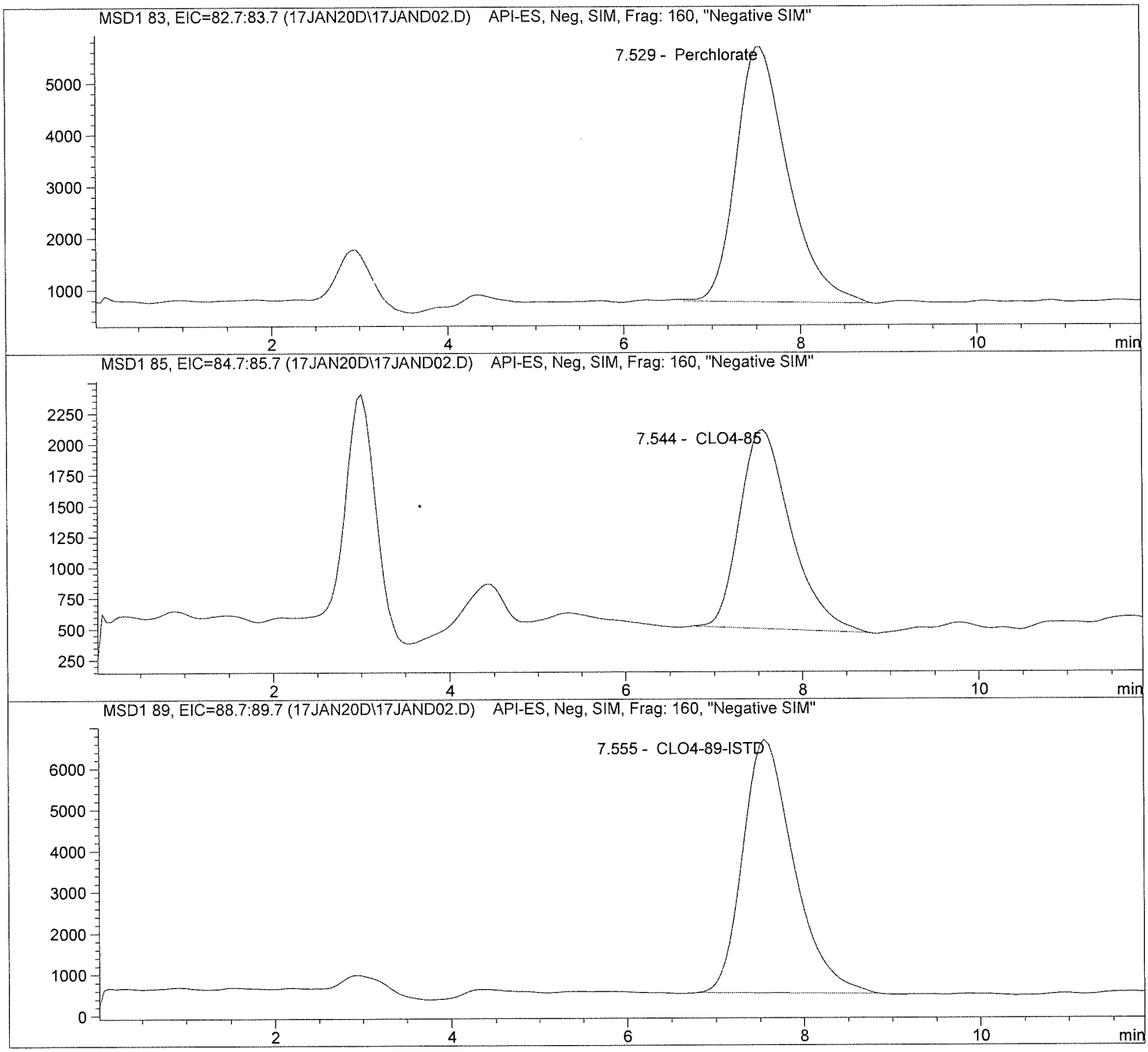
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND02.D Sample Name: 695963 LCS@3.

Injection Date:	2/17/2020 09:02:20	Seq Line:	2
Sample Name:	695963 LCS@3.	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: 2/17/2020 15:42:52

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND02.D Sample Name: 695963 LCS@3.

Injection Date:	2/17/2020 09:02:20	Seq Line:	2
Sample Name:	695963 LCS@3.	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: 2/17/2020 15:42:52

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
7.529	BBA	201219.2	2.9946	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.544	PBA	64955.2	3.0807	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.555	BBA	247234.1	5.0000	CLO4-89-ISTD

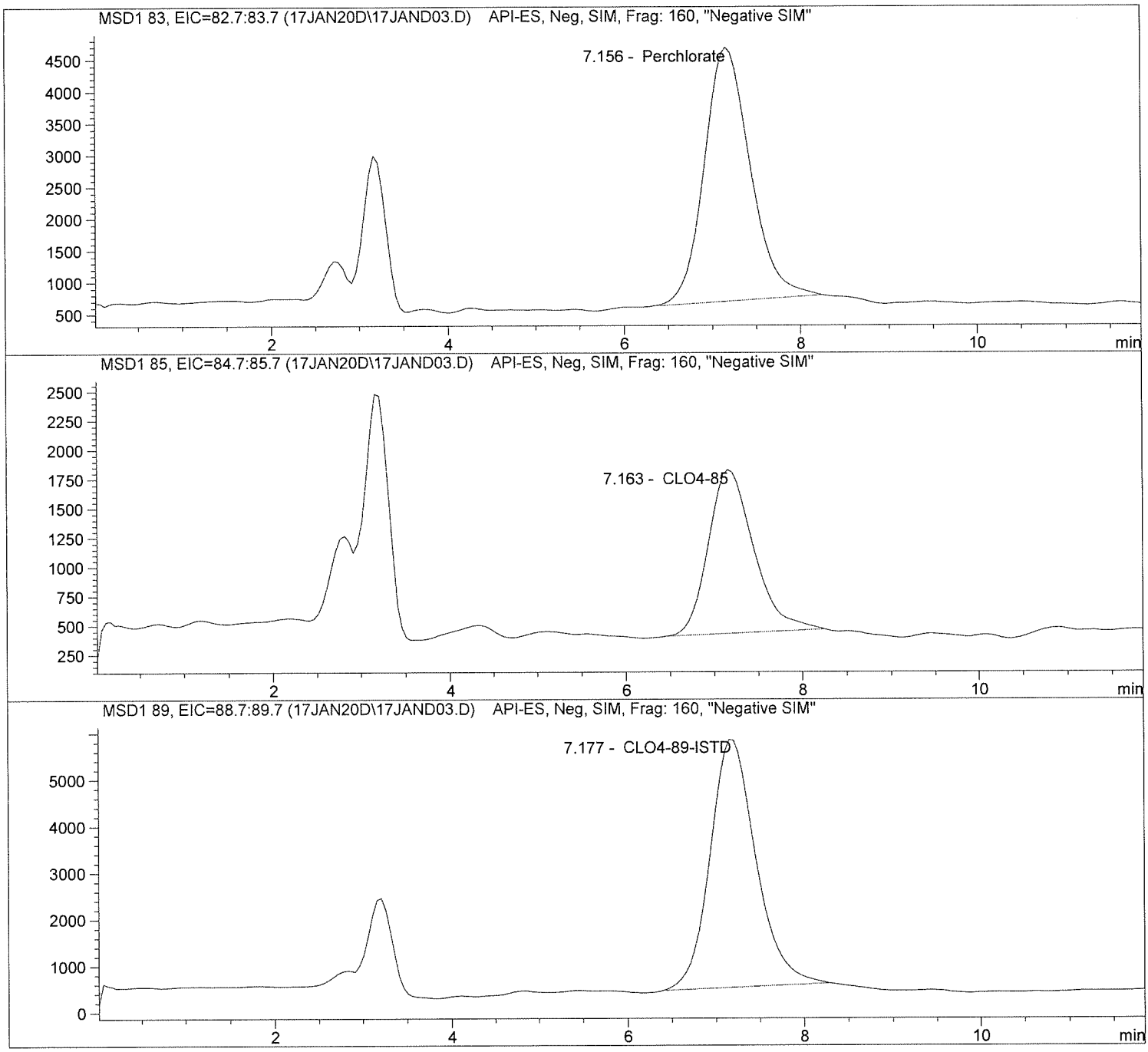
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND03.D Sample Name: 695964 ICS@3.0

Injection Date:	2/17/2020 09:16:11	Seq Line:	3
Sample Name:	695964 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: 2/17/2020 15:42:52

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND03.D Sample Name: 695964 ICS@3.0

Injection Date:	2/17/2020 09:16:11	Seq Line:	3
Sample Name:	695964 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: 2/17/2020 15:42:52

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
7.156	BBA	144924.0	2.7634	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.163	PBA	49979.2	3.0392	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.177	PBA	192730.7	5.0000	CLO4-89-ISTD

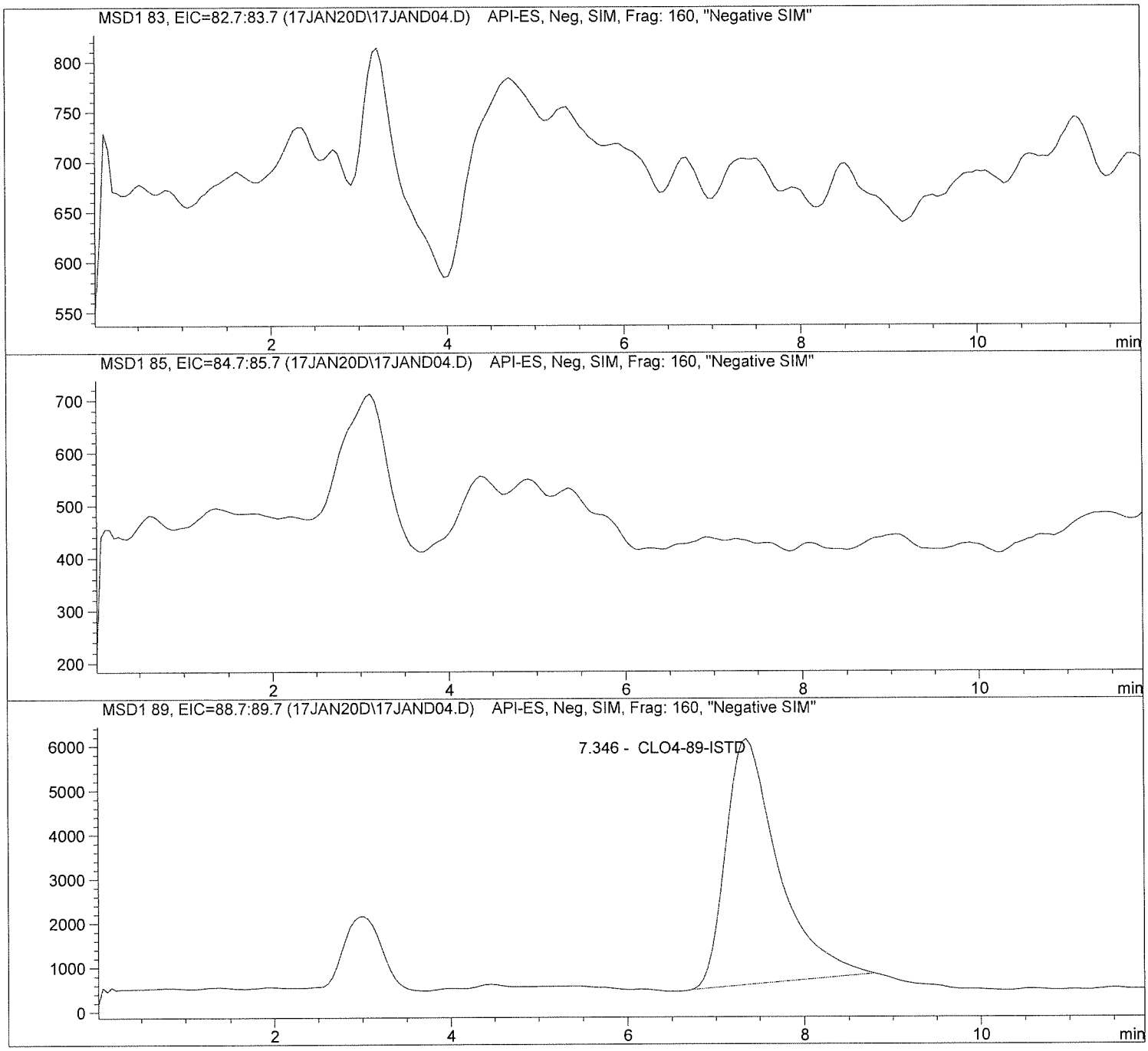
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND04.D Sample Name: 695966 LMB

Injection Date:	2/17/2020 09:30:08	Seq Line:	4
Sample Name:	695966 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: 2/17/2020 15:42:52

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND04.D Sample Name: 695966 LMB

Injection Date:	2/17/2020 09:30:08	Seq Line:	4
Sample Name:	695966 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:	2/17/2020 15:42:52

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
7.346	PBA	229809.2	5.0000	CLO4-89-ISTD

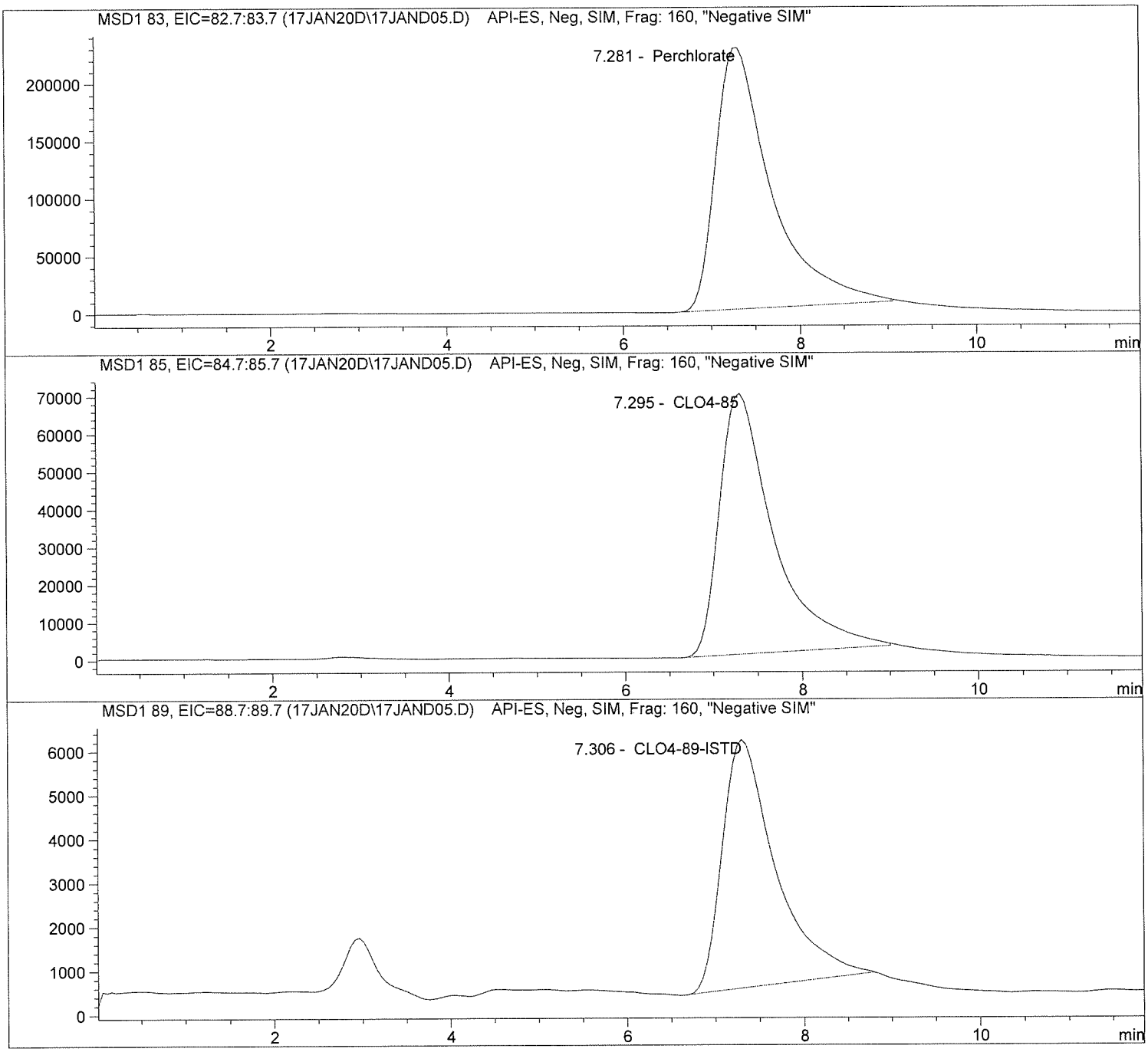
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND05.D Sample Name: 2004545001 100

Injection Date:	2/17/2020 09:44:01	Seq Line:	5
Sample Name:	2004545001 100	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: 2/17/2020 15:42:52

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND05.D Sample Name: 2004545001 100

Injection Date:	2/17/2020 09:44:01	Seq Line:	5
Sample Name:	2004545001 100	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:	2/17/2020 15:42:52

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
7.281	PBA	9919537.0	10682.7974	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.295	PBA	2929815.8	10575.9042	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.306	PBA	235908.1	500.0000	CLO4-89-ISTD

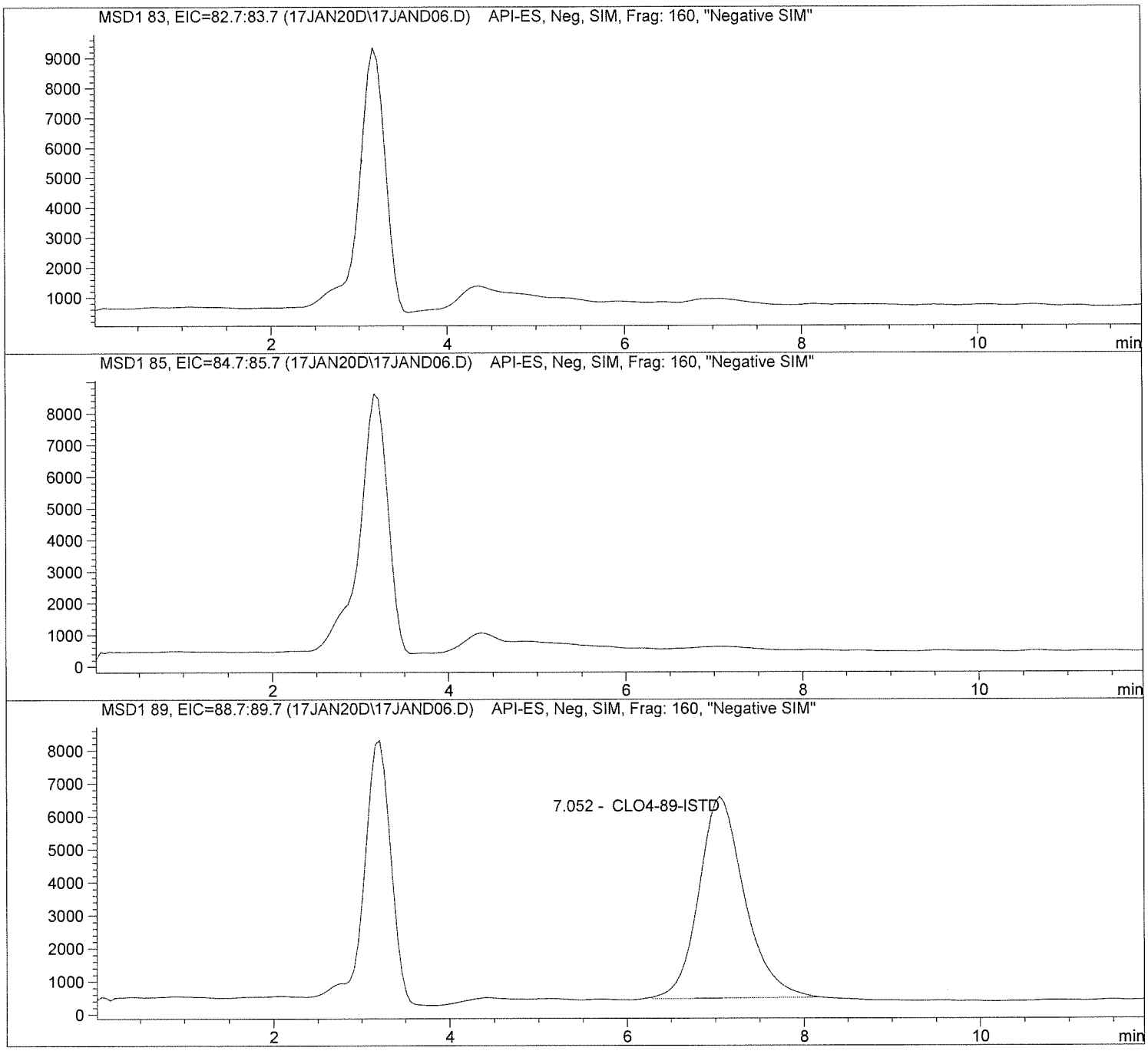
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND06.D Sample Name: 2004546001

Injection Date:	2/17/2020 09:57:56	Seq Line:	6
Sample Name:	2004546001	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: 2/17/2020 15:42:52

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND06.D Sample Name: 2004546001

Injection Date:	2/17/2020 09:57:56	Seq Line:	6
Sample Name:	2004546001	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:	2/17/2020 15:42:52

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
7.052	BBA	219400.8	5.0000	CLO4-89-ISTD

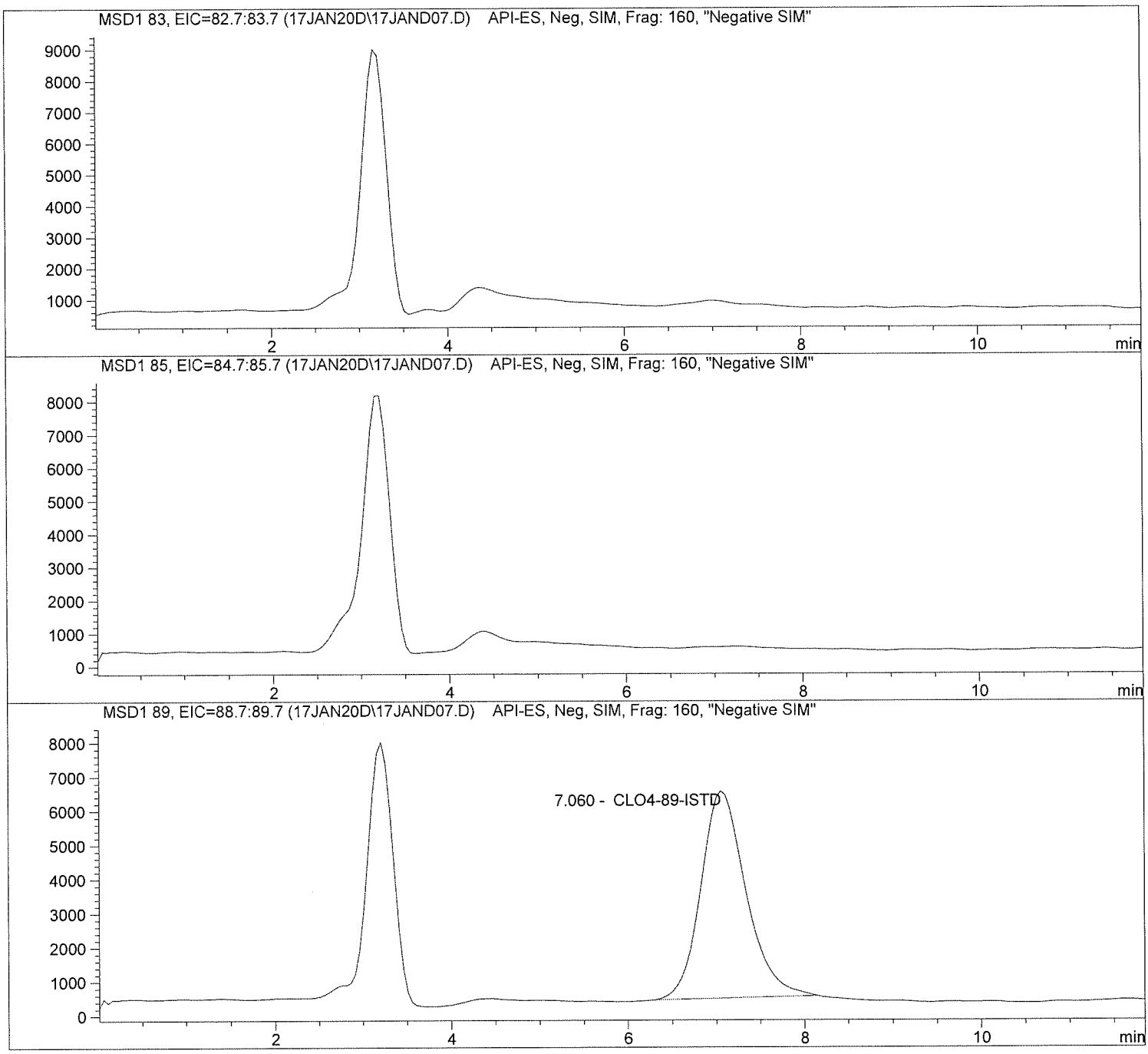
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND07.D Sample Name: 2004547001

Injection Date:	2/17/2020 10:11:50	Seq Line:	7
Sample Name:	2004547001	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: 2/17/2020 15:42:52

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND07.D Sample Name: 2004547001

Injection Date:	2/17/2020 10:11:50	Seq Line:	7
Sample Name:	2004547001	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: 2/17/2020 15:42:52

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	215048.0	5.0000	CLO4-89-ISTD

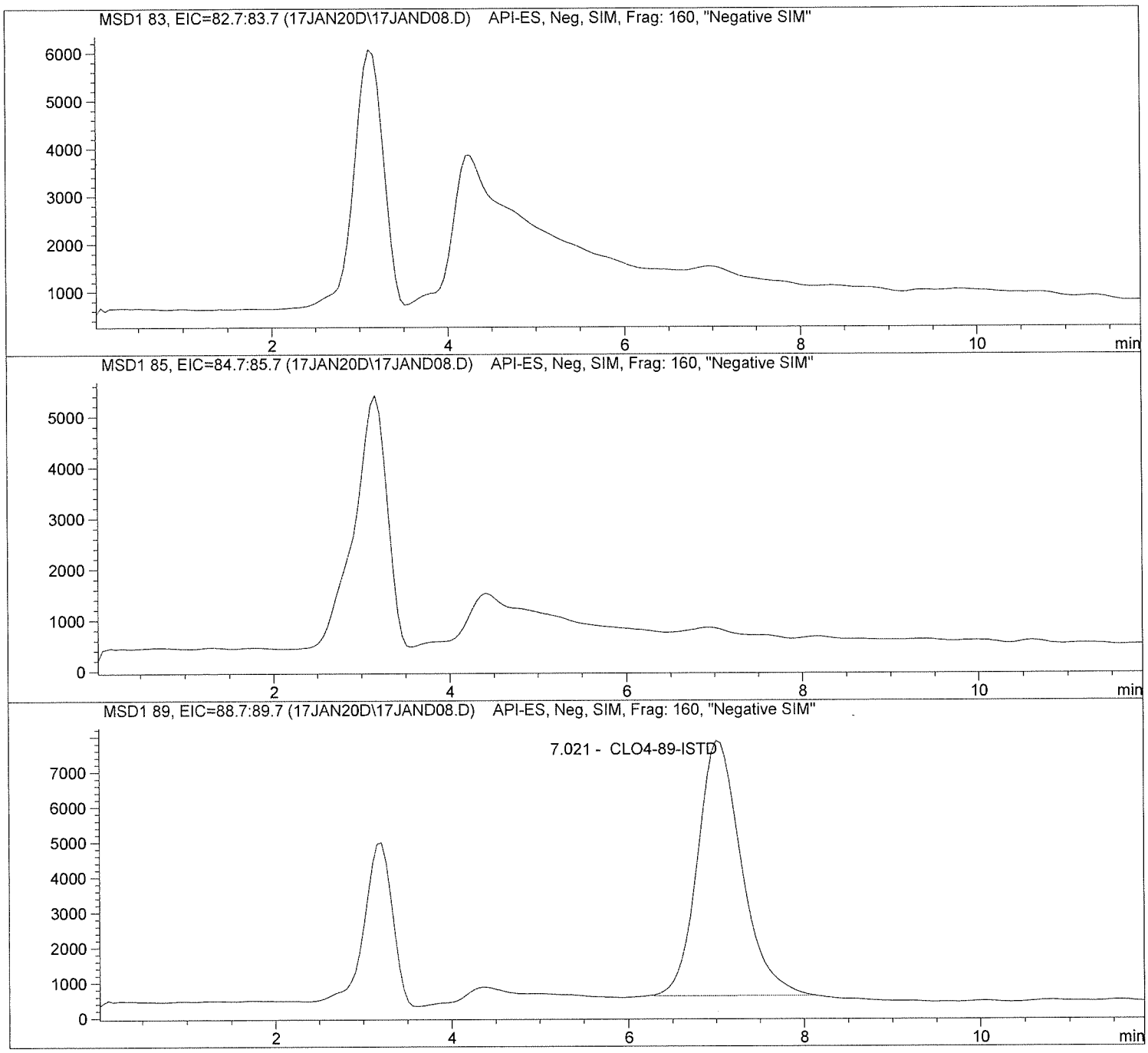
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND08.D Sample Name: 2004548001

Injection Date:	2/17/2020 10:25:44	Seq Line:	8
Sample Name:	2004548001	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: 2/17/2020 15:42:52

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND08.D Sample Name: 2004548001

Injection Date:	2/17/2020 10:25:44	Seq Line:	8
Sample Name:	2004548001	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: 2/17/2020 15:42:52

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
7.021	BBA	254205.5	5.0000	CLO4-89-ISTD

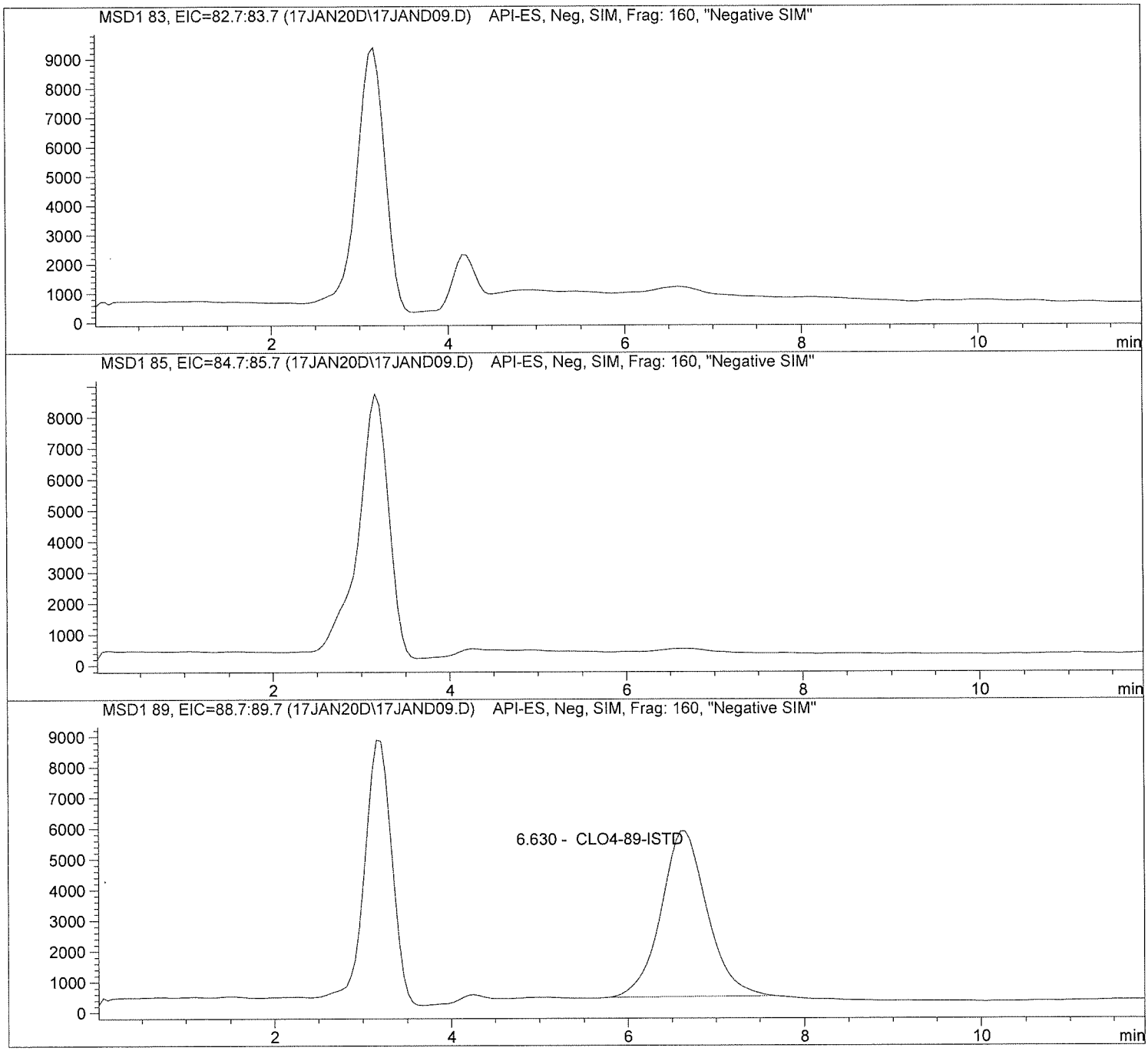
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND09.D Sample Name: 2004548002

Injection Date:	2/17/2020 10:39:36	Seq Line:	9
Sample Name:	2004548002	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: 2/17/2020 15:42:52

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND09.D Sample Name: 2004548002

Injection Date:	2/17/2020 10:39:36	Seq Line:	9
Sample Name:	2004548002	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: 2/17/2020 15:42:52

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
6.630	PBA	196394.8	5.0000	CLO4-89-ISTD

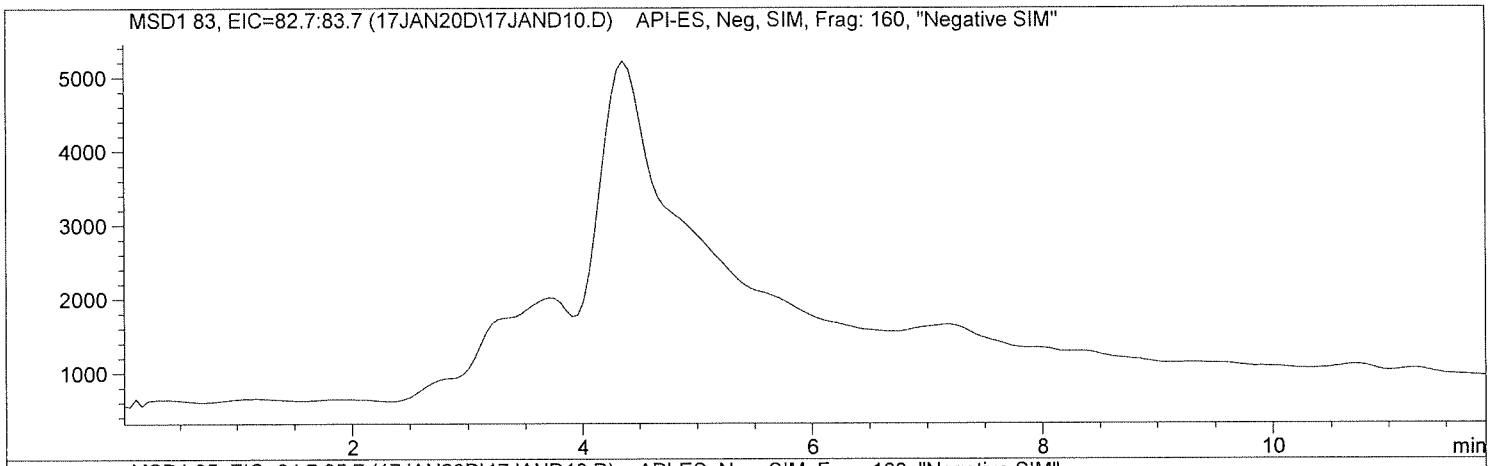
*** End of Report ***

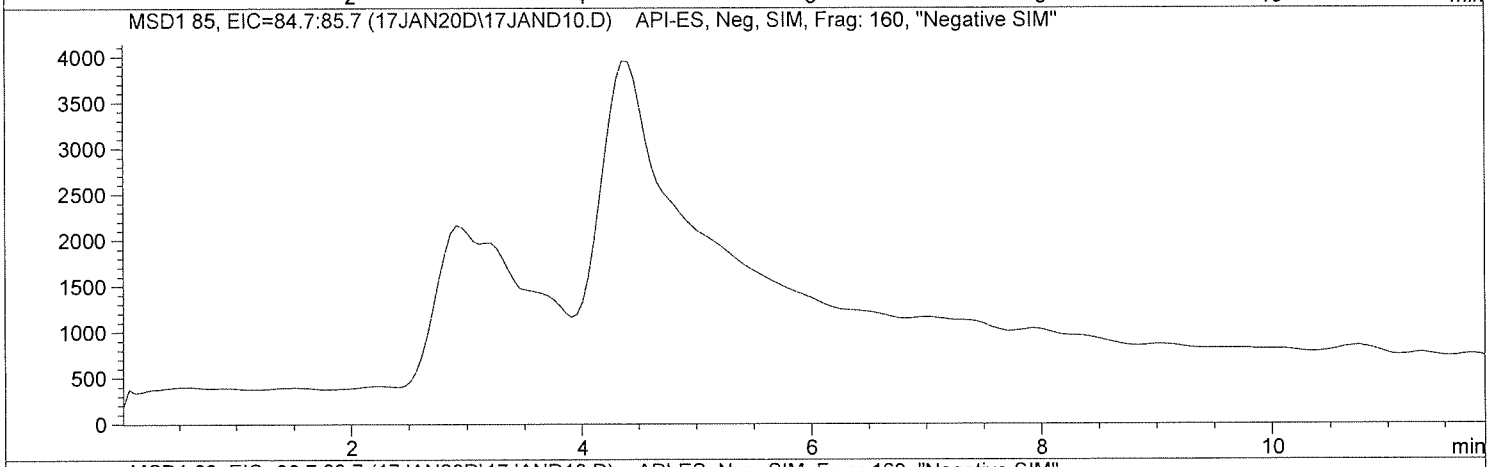
Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND10.D Sample Name: 2004548003

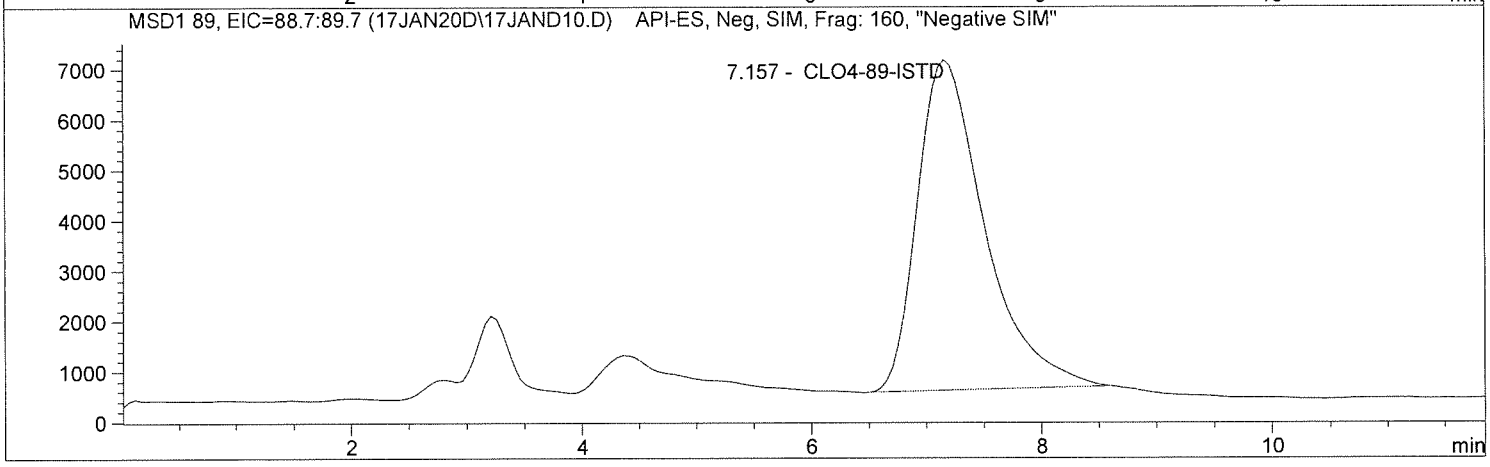
Injection Date:	2/17/2020 10:53:30	Seq Line:	10
Sample Name:	2004548003	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 2/17/2020 15:42:52

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND10.D Sample Name: 2004548003

Injection Date:	2/17/2020 10:53:30	Seq Line:	10
Sample Name:	2004548003	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: 2/17/2020 15:42:52

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
7.157	PBA	266482.4	5.0000	CLO4-89-ISTD

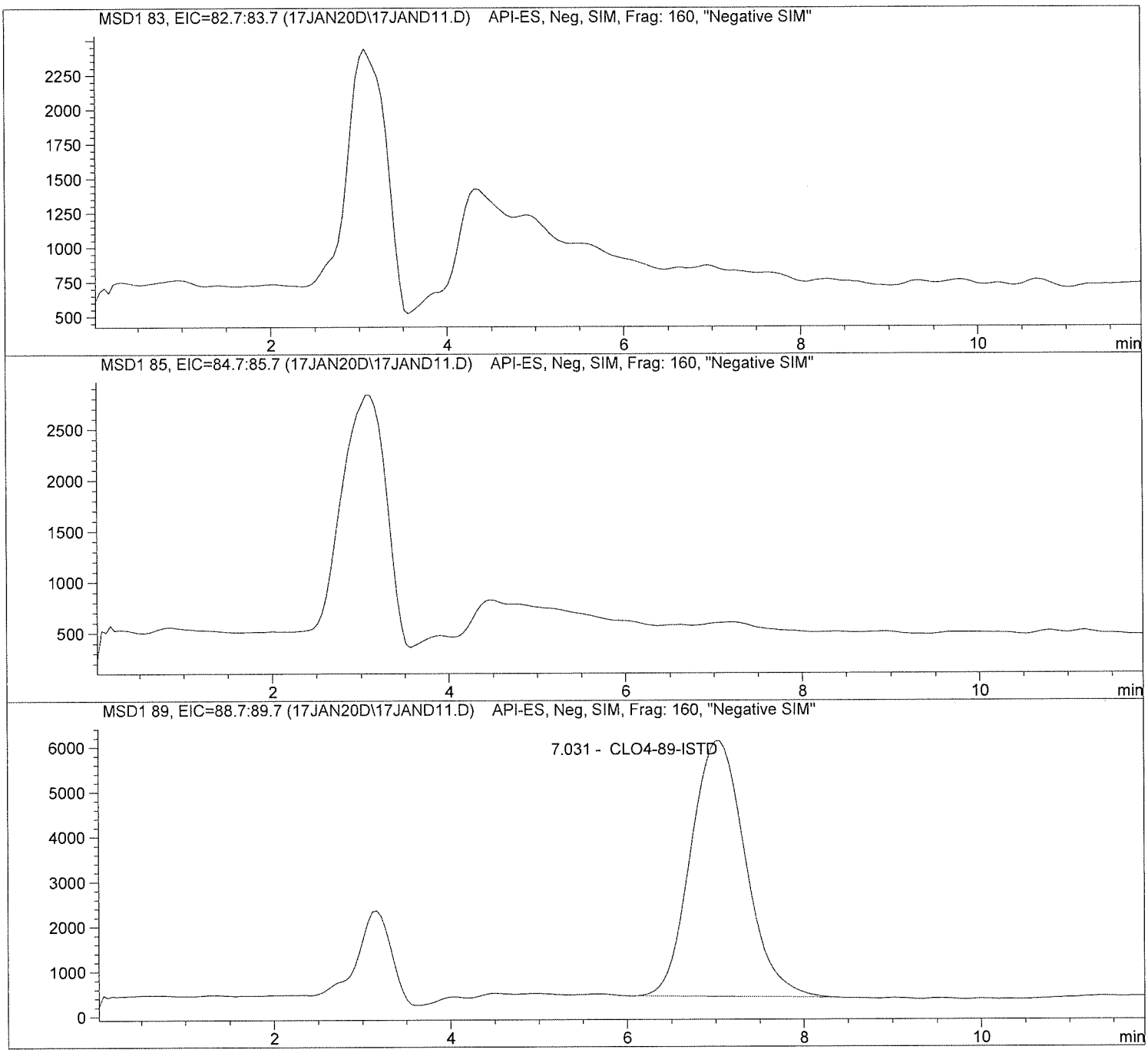
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND11.D Sample Name: 2004548004

Injection Date:	2/17/2020 11:07:22	Seq Line:	11
Sample Name:	2004548004	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: 2/17/2020 15:42:52

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND11.D Sample Name: 2004548004

Injection Date:	2/17/2020 11:07:22	Seq Line:	11
Sample Name:	2004548004	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:	2/17/2020 15:42:52

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
7.031	PBA	245153.6	5.0000	CLO4-89-ISTD

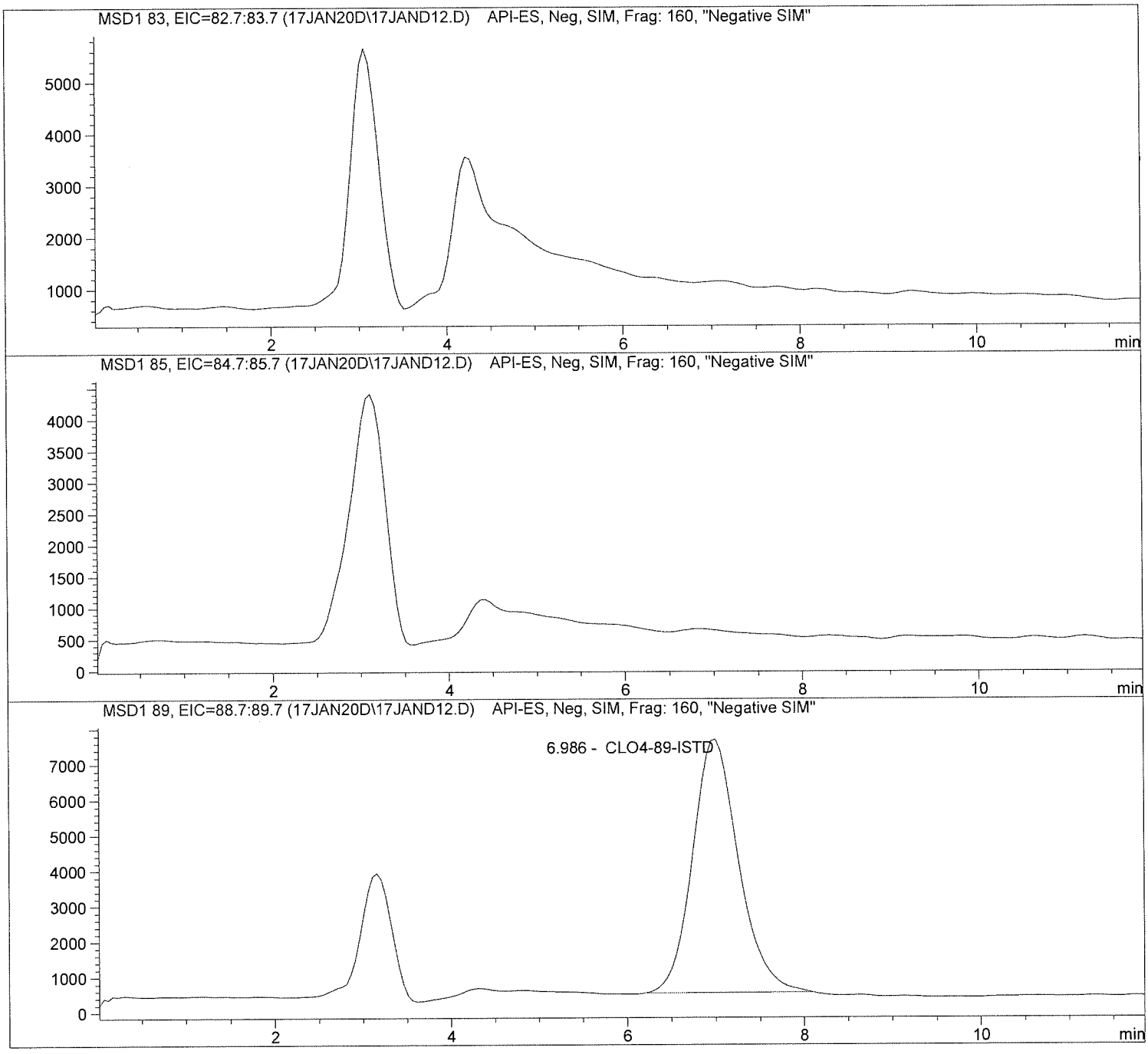
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND12.D Sample Name: 2004548005

Injection Date:	2/17/2020 11:21:13	Seq Line:	12
Sample Name:	2004548005	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: 2/17/2020 15:42:52

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND12.D Sample Name: 2004548005

Injection Date:	2/17/2020 11:21:13	Seq Line:	12
Sample Name:	2004548005	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: 2/17/2020 15:42:52

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
6.986	PBA	258211.1	5.0000	CLO4-89-ISTD

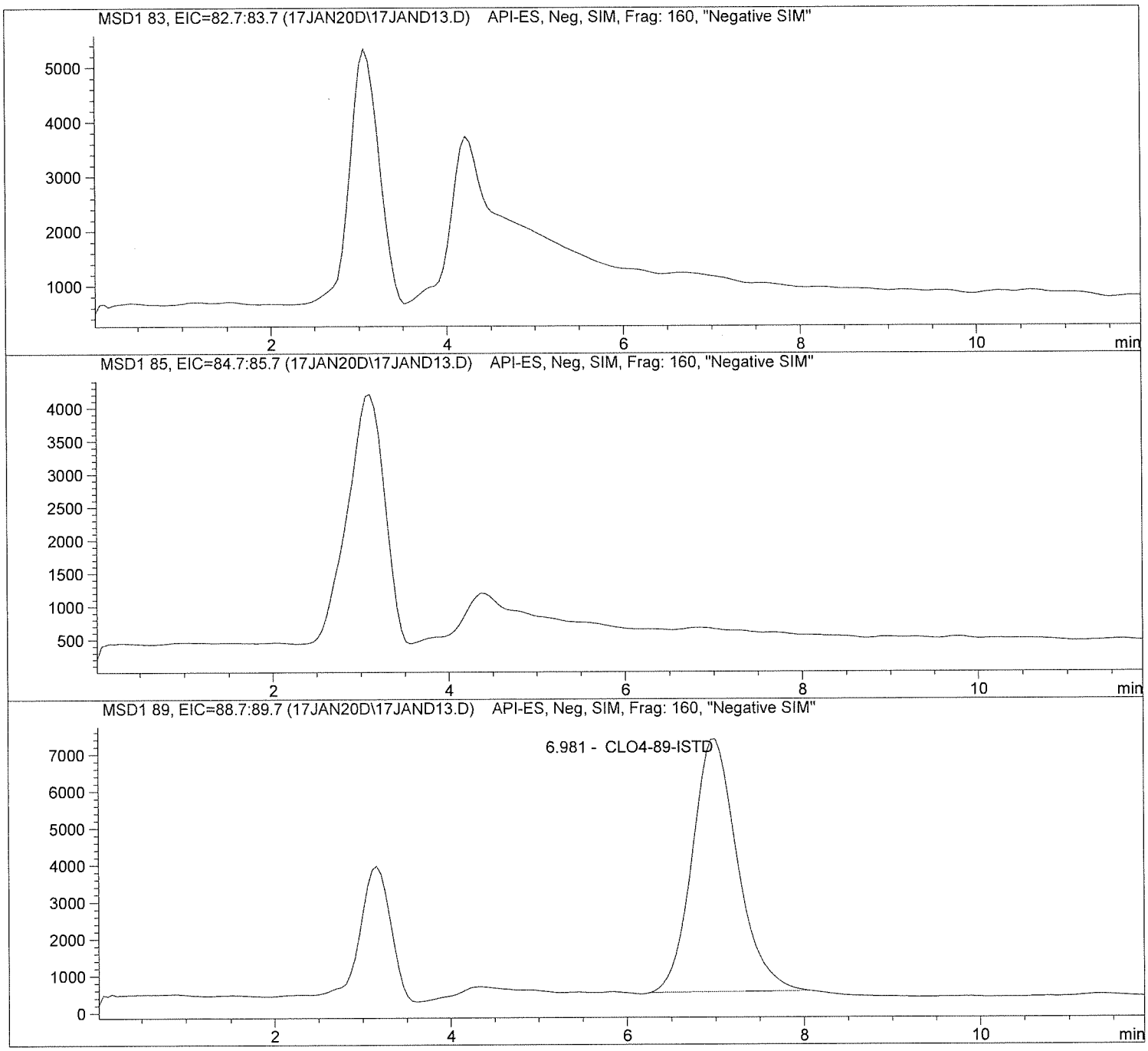
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND13.D Sample Name: 2004548006

Injection Date:	2/17/2020 11:35:03	Seq Line:	13
Sample Name:	2004548006	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: 2/17/2020 15:42:52

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND13.D Sample Name: 2004548006

Injection Date:	2/17/2020 11:35:03	Seq Line:	13
Sample Name:	2004548006	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: 2/17/2020 15:42:52

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
6.981	PBA	244278.8	5.0000	CLO4-89-ISTD

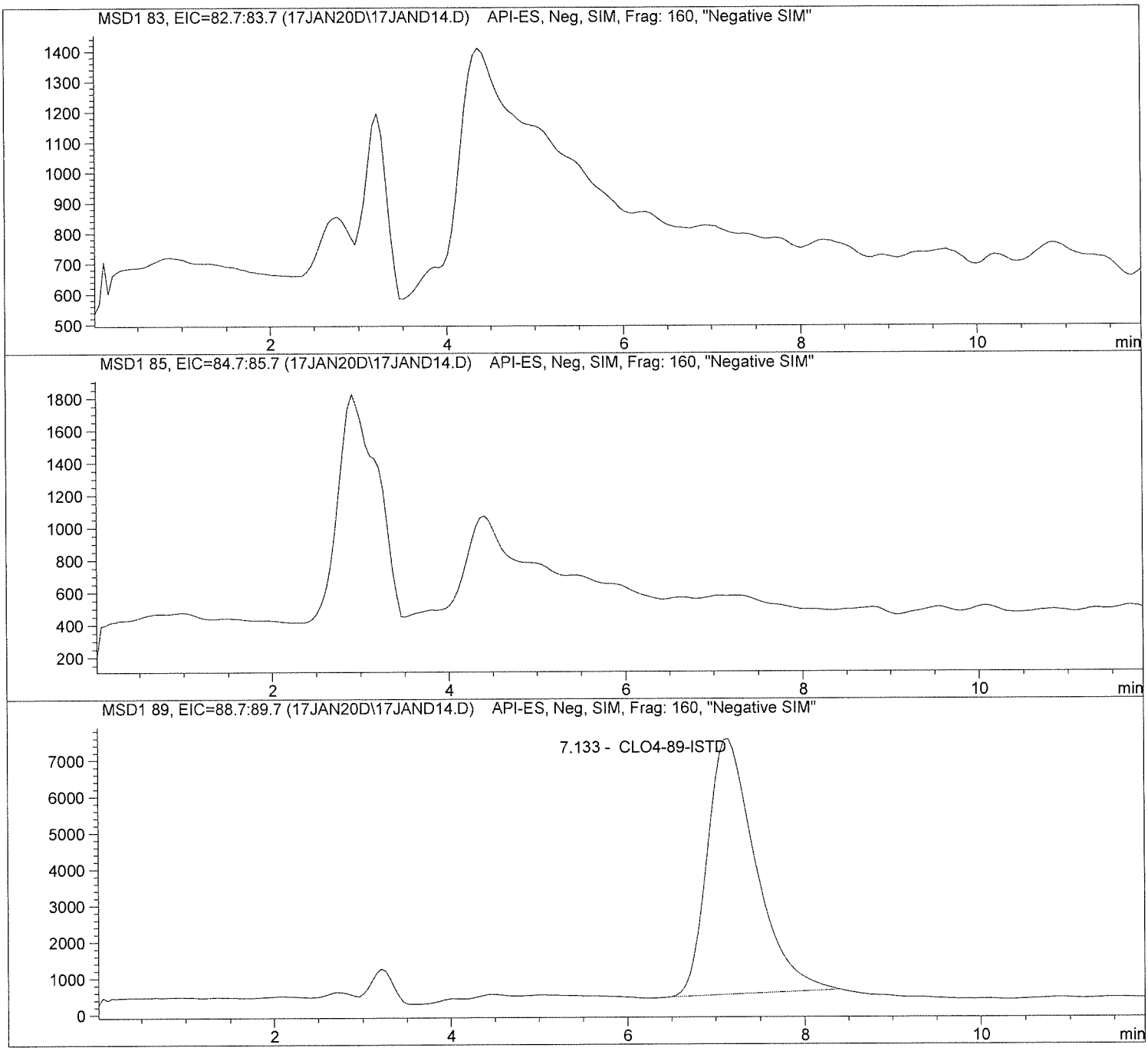
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND14.D Sample Name: 2004548007

Injection Date:	2/17/2020 11:49:00	Seq Line:	14
Sample Name:	2004548007	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: 2/17/2020 15:42:52

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND14.D Sample Name: 2004548007

Injection Date:	2/17/2020 11:49:00	Seq Line:	14
Sample Name:	2004548007	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: 2/17/2020 15:42:52

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
7.133	PBA	265819.8	5.0000	CLO4-89-ISTD

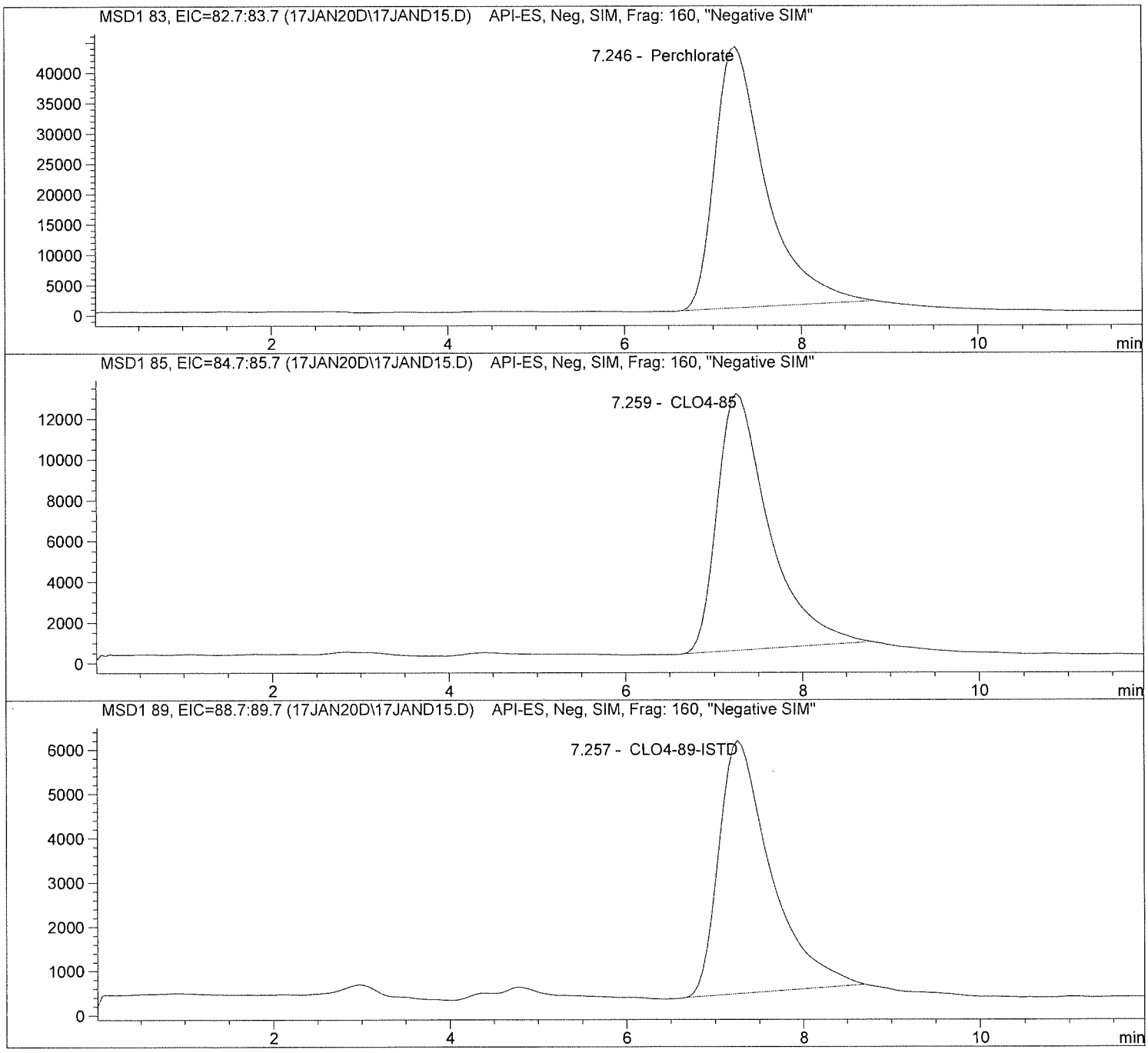
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND15.D Sample Name: 695967 CCV@25

Injection Date:	2/17/2020 12:02:52	Seq Line:	15
Sample Name:	695967 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: 2/17/2020 15:42:52

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND15.D Sample Name: 695967 CCV@25

Injection Date:	2/17/2020 12:02:52	Seq Line:	15
Sample Name:	695967 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:	2/17/2020 15:42:52

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
7.246	PBA	1729590.0	25.2642	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.259	PBA	512272.7	24.6022	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.257	PBA	233667.8	5.0000	CLO4-89-ISTD

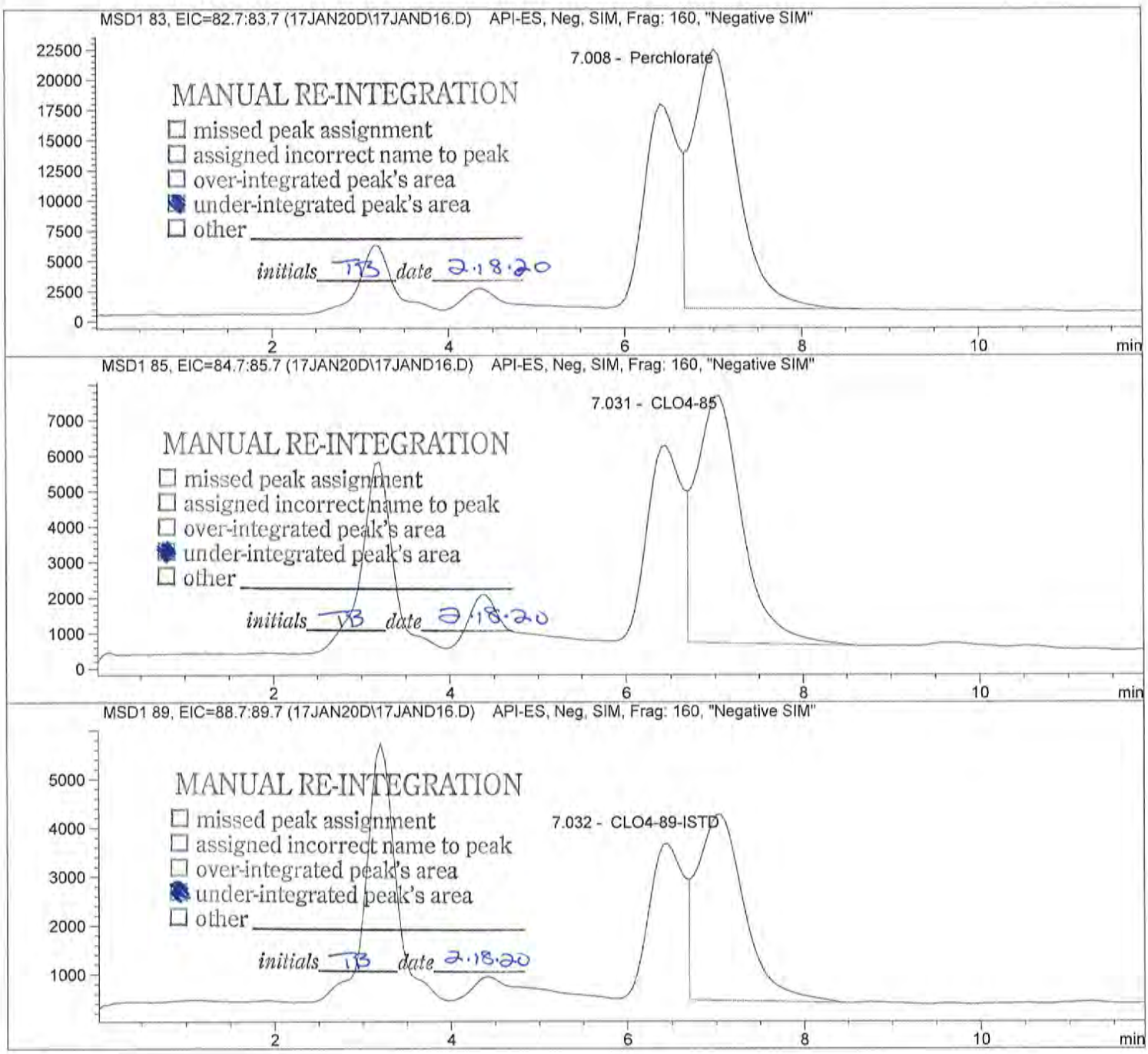
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND16.D Sample Name: 2004548008

Injection Date:	2/17/2020 12:16:47	Seq Line:	16
Sample Name:	2004548008	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: 2/17/2020 15:42:52

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND16.D Sample Name: 2004548008

Injection Date:	2/17/2020 12:16:47	Seq Line:	16
Sample Name:	2004548008	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: 2/17/2020 15:42:52

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
7.008	FM	748879.1	18.9784	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.031	FM	246750.5	20.3501	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.032	FM	138229.9	5.0000	CLO4-89-ISTD

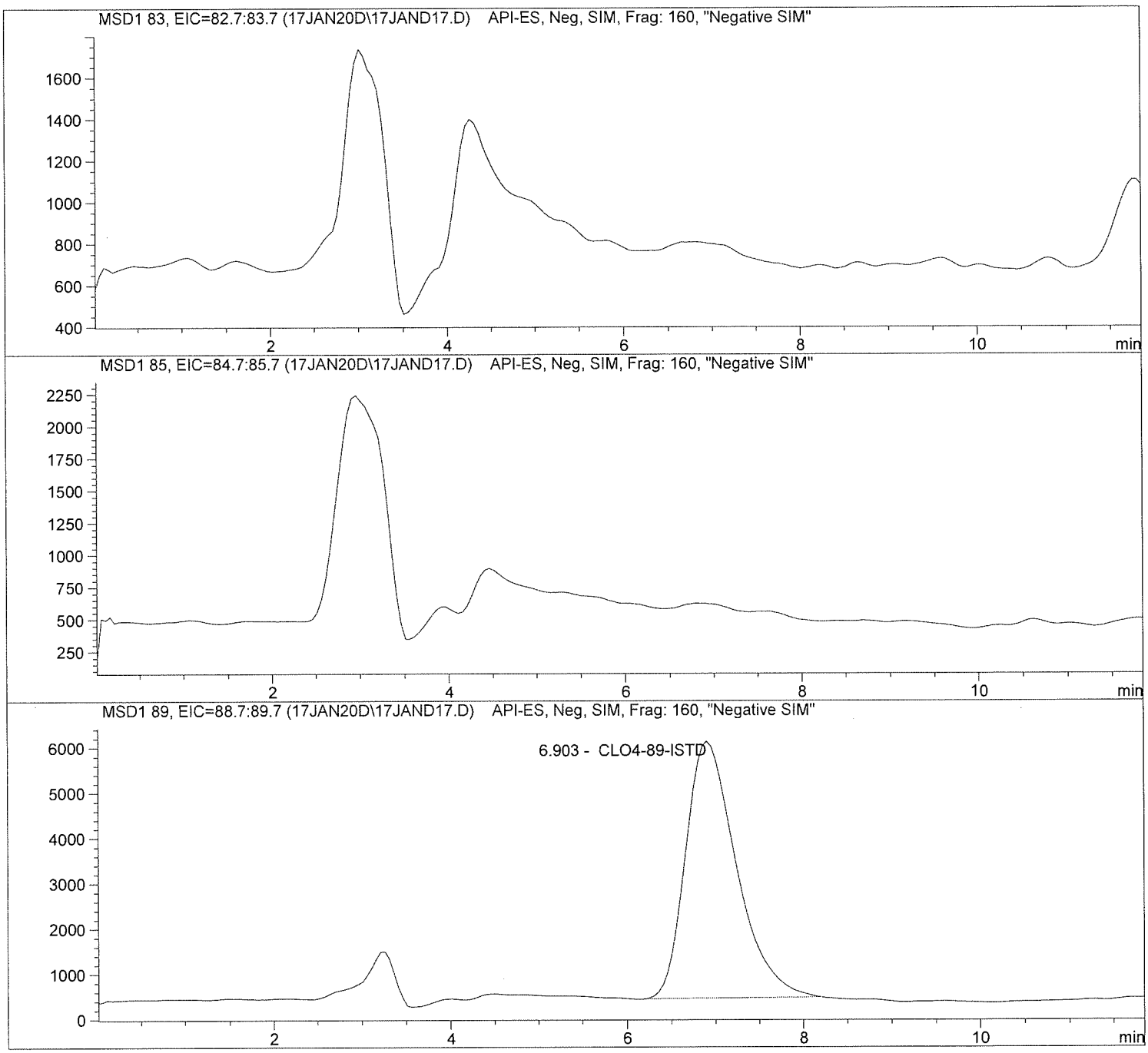
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND17.D Sample Name: 2004548009

Injection Date:	2/17/2020 12:30:39	Seq Line:	17
Sample Name:	2004548009	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: 2/17/2020 15:42:52

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND17.D Sample Name: 2004548009

Injection Date:	2/17/2020 12:30:39	Seq Line:	17
Sample Name:	2004548009	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: 2/17/2020 15:42:52

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
6.903	PBA	227261.6	5.0000	CLO4-89-ISTD

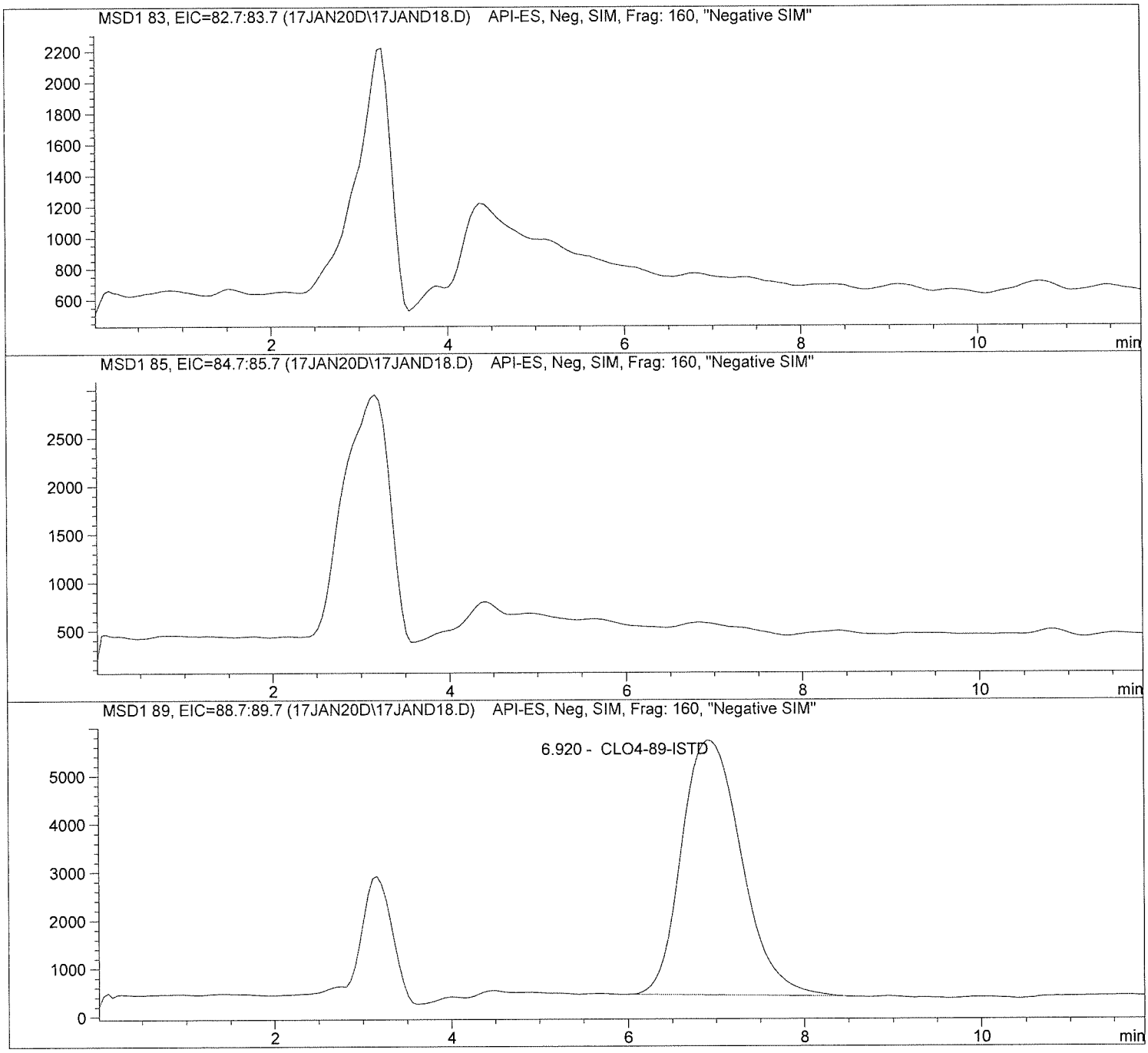
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND18.D Sample Name: 2004548010

Injection Date:	2/17/2020 12:44:31	Seq Line:	18
Sample Name:	2004548010	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: 2/17/2020 15:42:52

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND18.D Sample Name: 2004548010

Injection Date:	2/17/2020 12:44:31	Seq Line:	18
Sample Name:	2004548010	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: 2/17/2020 15:42:52

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
6.920	PBA	250414.9	5.0000	CLO4-89-ISTD

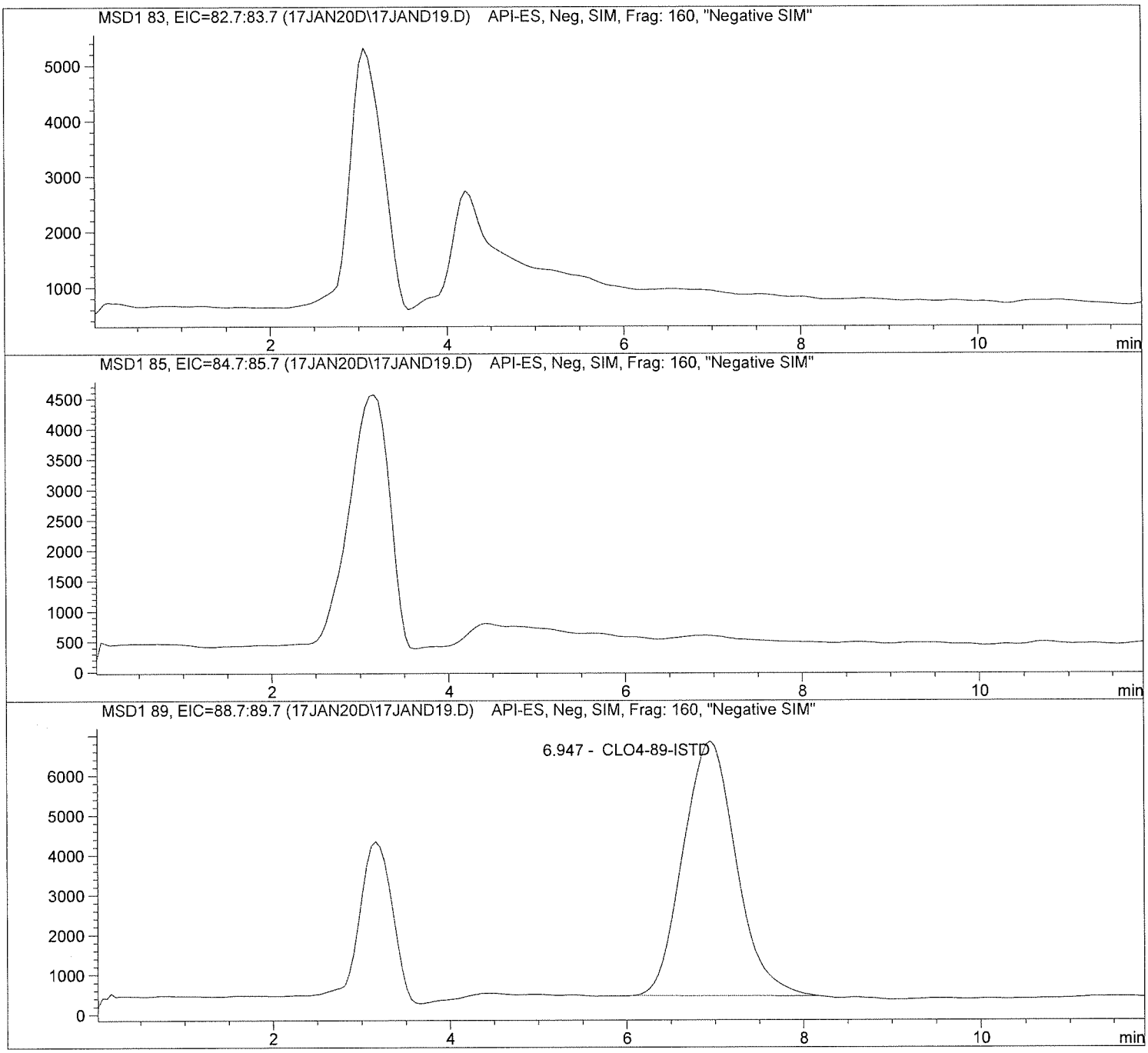
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND19.D Sample Name: 2004548011

Injection Date:	2/17/2020 12:58:22	Seq Line:	19
Sample Name:	2004548011	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: 2/17/2020 15:42:52

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND19.D Sample Name: 2004548011

Injection Date:	2/17/2020 12:58:22	Seq Line:	19
Sample Name:	2004548011	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: 2/17/2020 15:42:52

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
6.947	PBA	267411.8	5.0000	CLO4-89-ISTD

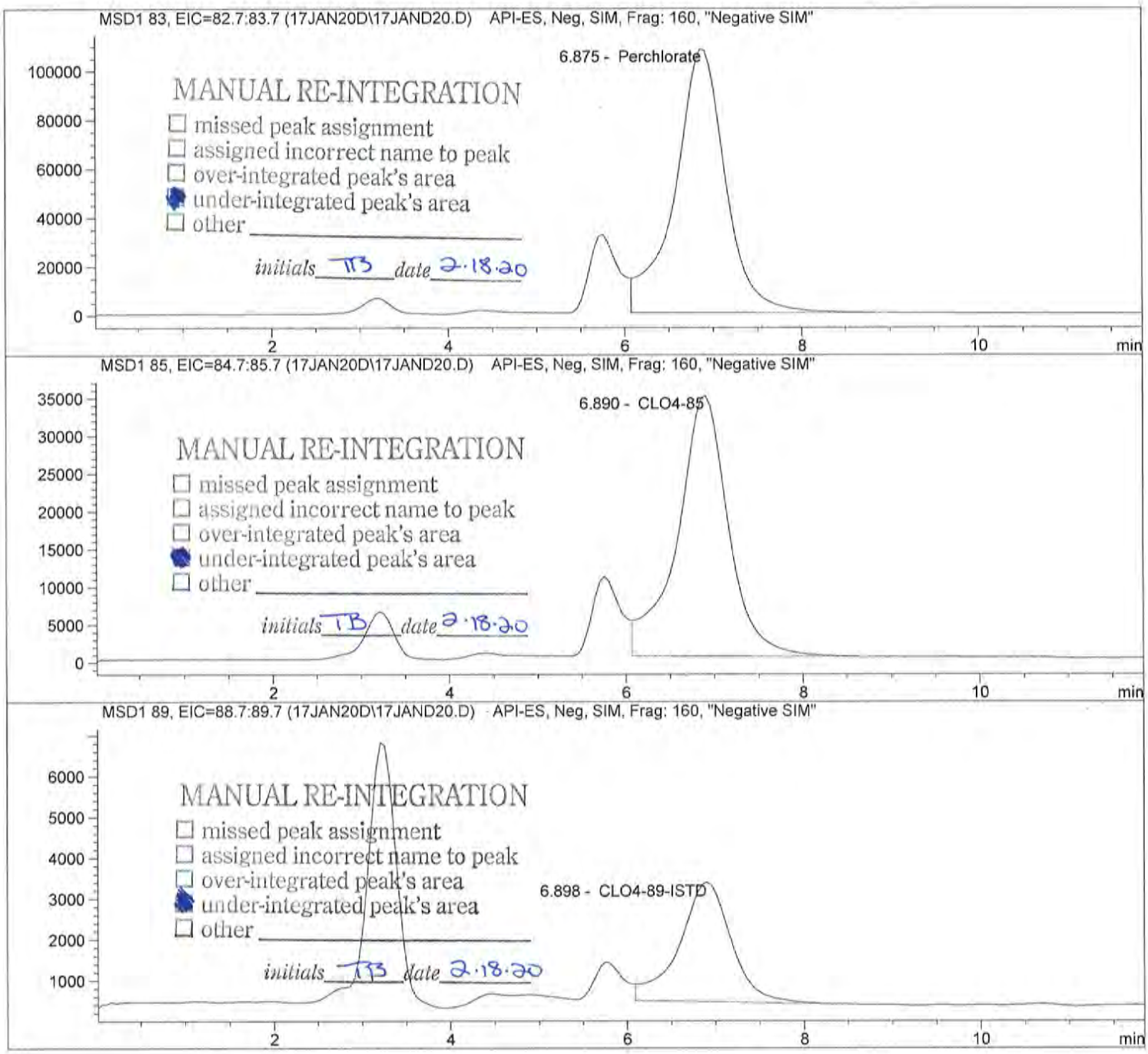
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND20.D Sample Name: 2004548012

Injection Date:	2/17/2020 13:12:19	Seq Line:	20
Sample Name:	2004548012	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: 2/17/2020 15:42:52

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND20.D Sample Name: 2004548012

Injection Date:	2/17/2020 13:12:19	Seq Line:	20
Sample Name:	2004548012	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: 2/17/2020 15:42:52

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
6.875	FM	4277198.5	94.6505	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.890	FM	1382737.4	100.2794	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.898	FM	119387.1	5.0000	CLO4-89-ISTD

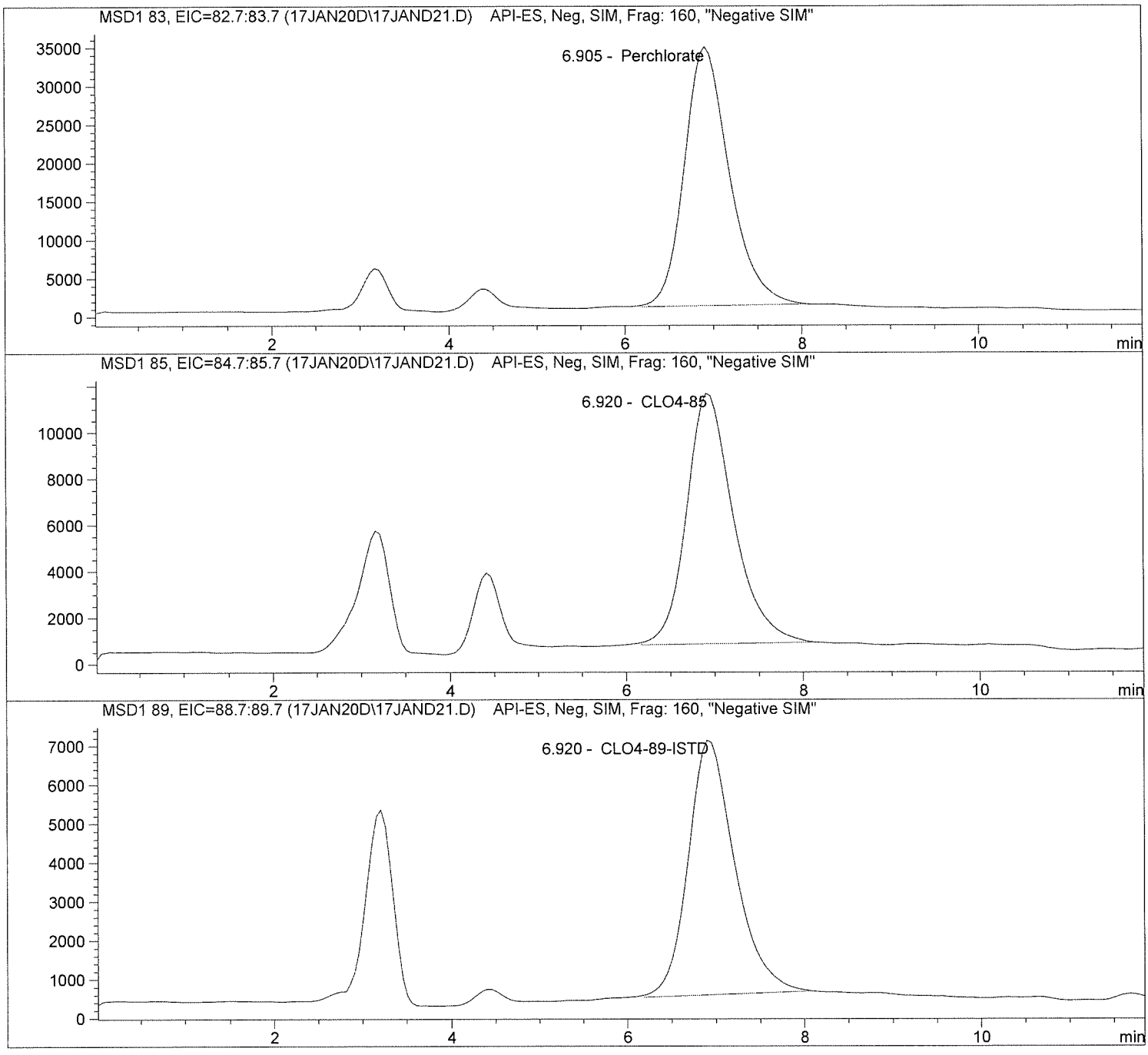
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND21.D Sample Name: 2004548013

Injection Date:	2/17/2020 13:26:12	Seq Line:	21
Sample Name:	2004548013	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: 2/17/2020 15:42:52

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND21.D Sample Name: 2004548013

Injection Date:	2/17/2020 13:26:12	Seq Line:	21
Sample Name:	2004548013	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: 2/17/2020 15:42:52

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
6.905	BBA	1185693.1	17.5126	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.920	BBA	397137.3	19.0629	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.920	BBA	238618.0	5.0000	CLO4-89-ISTD

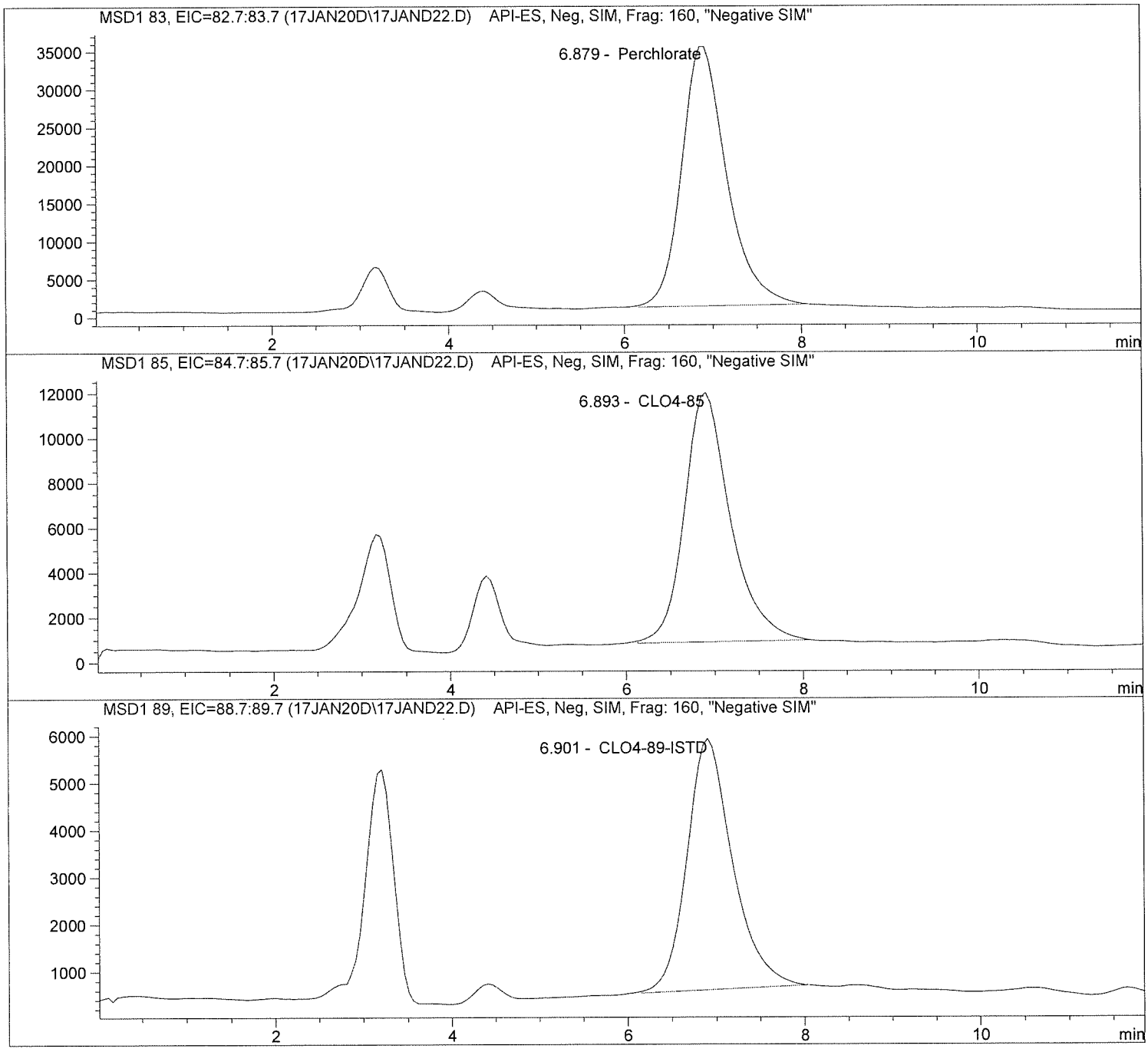
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND22.D Sample Name: 2004548014

Injection Date:	2/17/2020 13:40:06	Seq Line:	22
Sample Name:	2004548014	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: 2/17/2020 15:42:52

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND22.D Sample Name: 2004548014

Injection Date:	2/17/2020 13:40:06	Seq Line:	22
Sample Name:	2004548014	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: 2/17/2020 15:42:52

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
6.879	BBA	1208615.6	21.8897	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.893	BBA	402089.2	23.6919	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.901	BBA	191102.0	5.0000	CLO4-89-ISTD

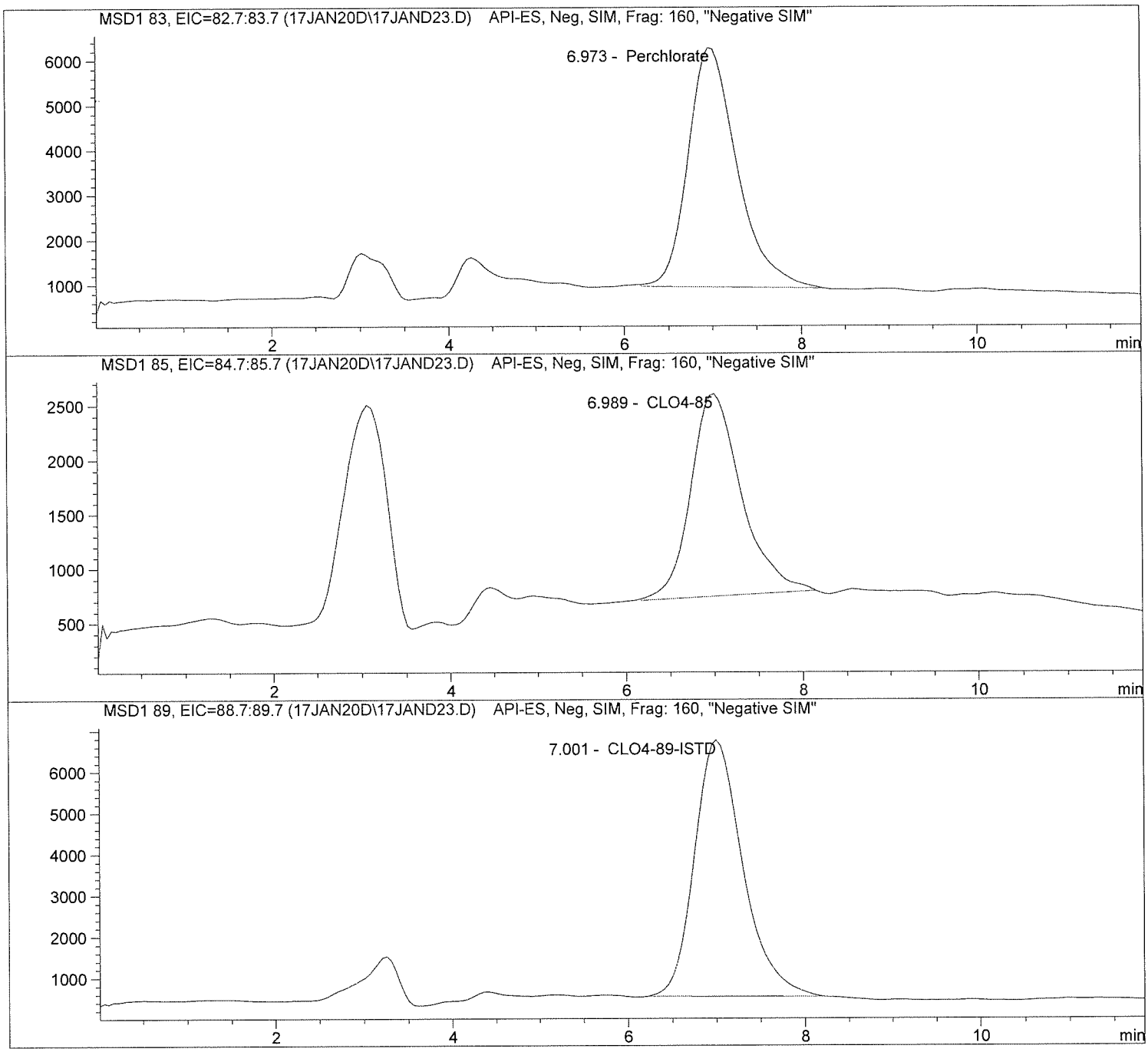
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND23.D Sample Name: 2004548015 MS

Injection Date:	2/17/2020 14:54:53	Seq Line:	23
Sample Name:	2004548015 MS	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: 2/17/2020 15:42:52

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND23.D Sample Name: 2004548015 MS

Injection Date:	2/17/2020 14:54:53	Seq Line:	23
Sample Name:	2004548015 MS	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: 2/17/2020 15:42:52

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	BBA	205914.9	3.1969	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.989	BBA	74577.8	3.7093	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.001	PBA	237178.4	5.0000	CLO4-89-ISTD

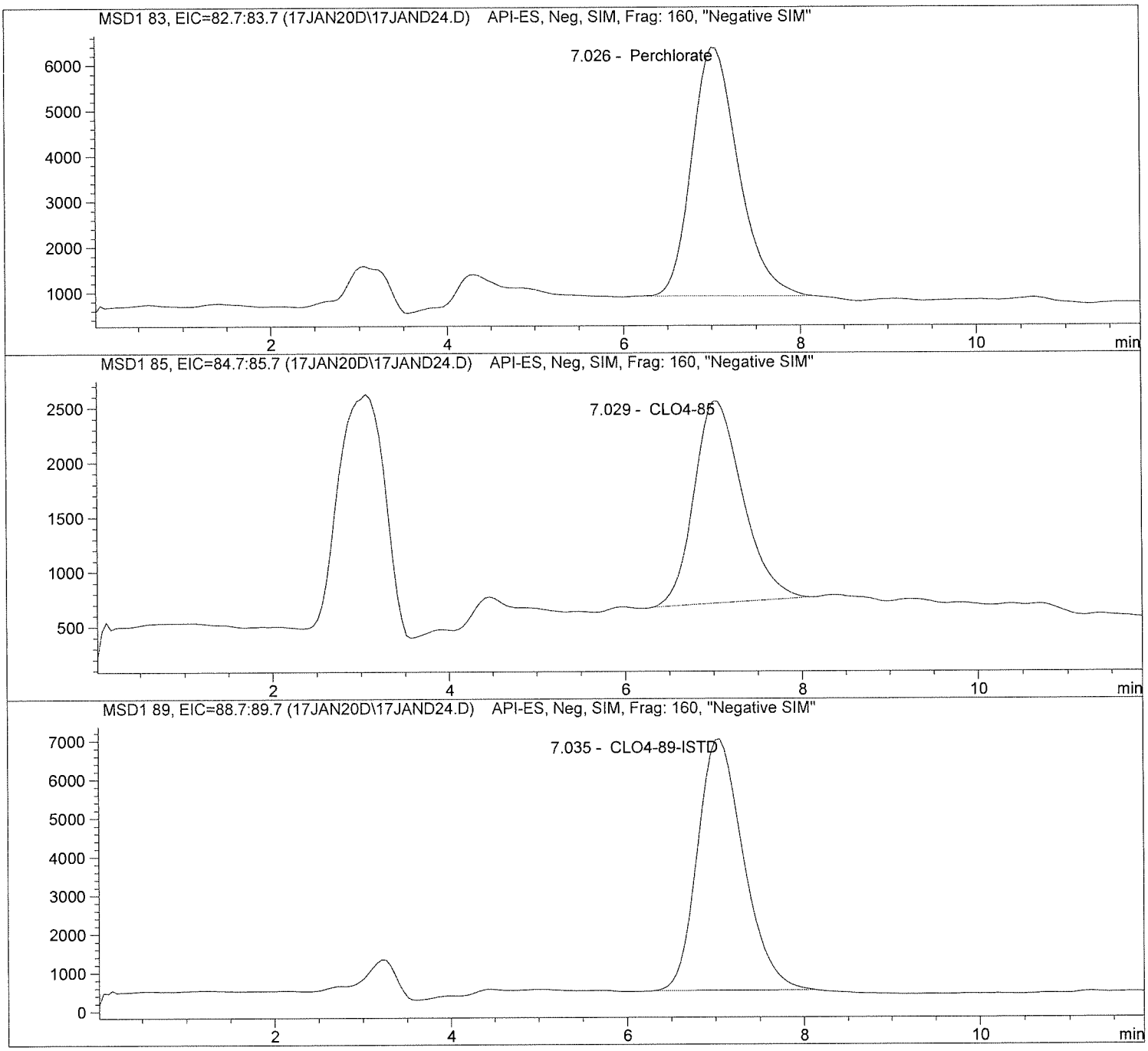
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND24.D Sample Name: 2004548016 MSD

Injection Date:	2/17/2020 15:08:46	Seq Line:	24
Sample Name:	2004548016 MSD	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: 2/17/2020 15:42:52

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND24.D Sample Name: 2004548016 MSD

Injection Date:	2/17/2020 15:08:46	Seq Line:	24
Sample Name:	2004548016 MSD	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: 2/17/2020 15:42:52

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
7.026	BBA	199352.0	3.1385	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.029	PBA	70132.0	3.5331	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.035	PBA	233840.1	5.0000	CLO4-89-ISTD

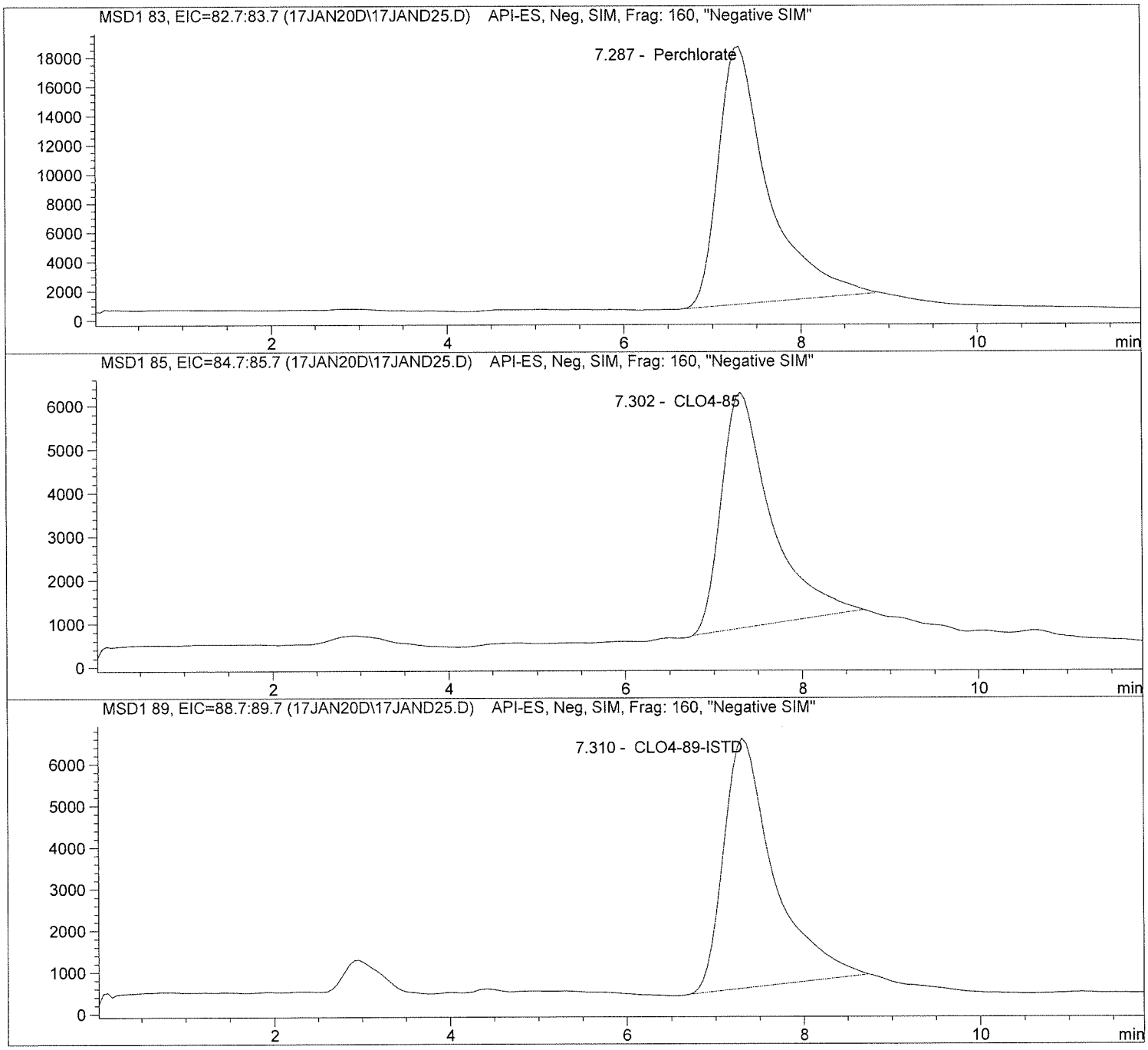
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND25.D Sample Name: 2004545001 1K

Injection Date:	2/17/2020 15:22:38	Seq Line:	25
Sample Name:	2004545001 1K	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: 2/17/2020 15:42:52

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND25.D Sample Name: 2004545001 1K

Injection Date:	2/17/2020 15:22:38	Seq Line:	25
Sample Name:	2004545001 1K	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: 2/17/2020 15:42:52

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
7.287	PBA	698274.0	10634.7156	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.302	PBA	211342.7	10471.5946	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.310	PBA	237890.8	5000.0000	CLO4-89-ISTD

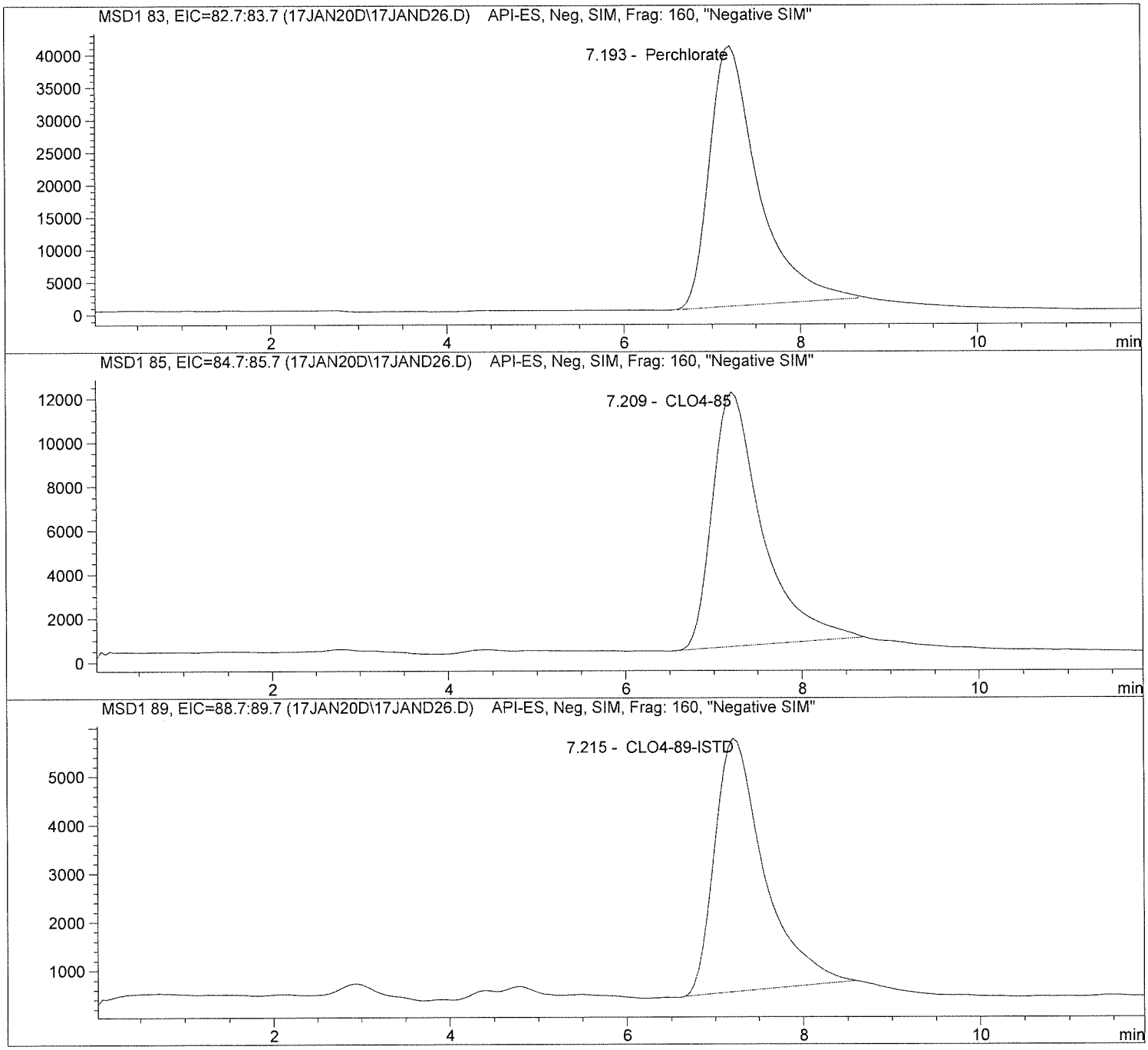
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND26.D Sample Name: 695968 CCV@25

Injection Date:	2/17/2020 15:36:30	Seq Line:	26
Sample Name:	695968 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: 2/17/2020 15:42:52

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND26.D Sample Name: 695968 CCV@25

Injection Date:	2/17/2020 15:36:30	Seq Line:	26
Sample Name:	695968 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:	2/17/2020 15:42:52

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
7.193	PBA	1543213.8	25.7523	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.209	PBA	453507.4	24.9041	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.215	PBA	204125.2	5.0000	CLO4-89-ISTD

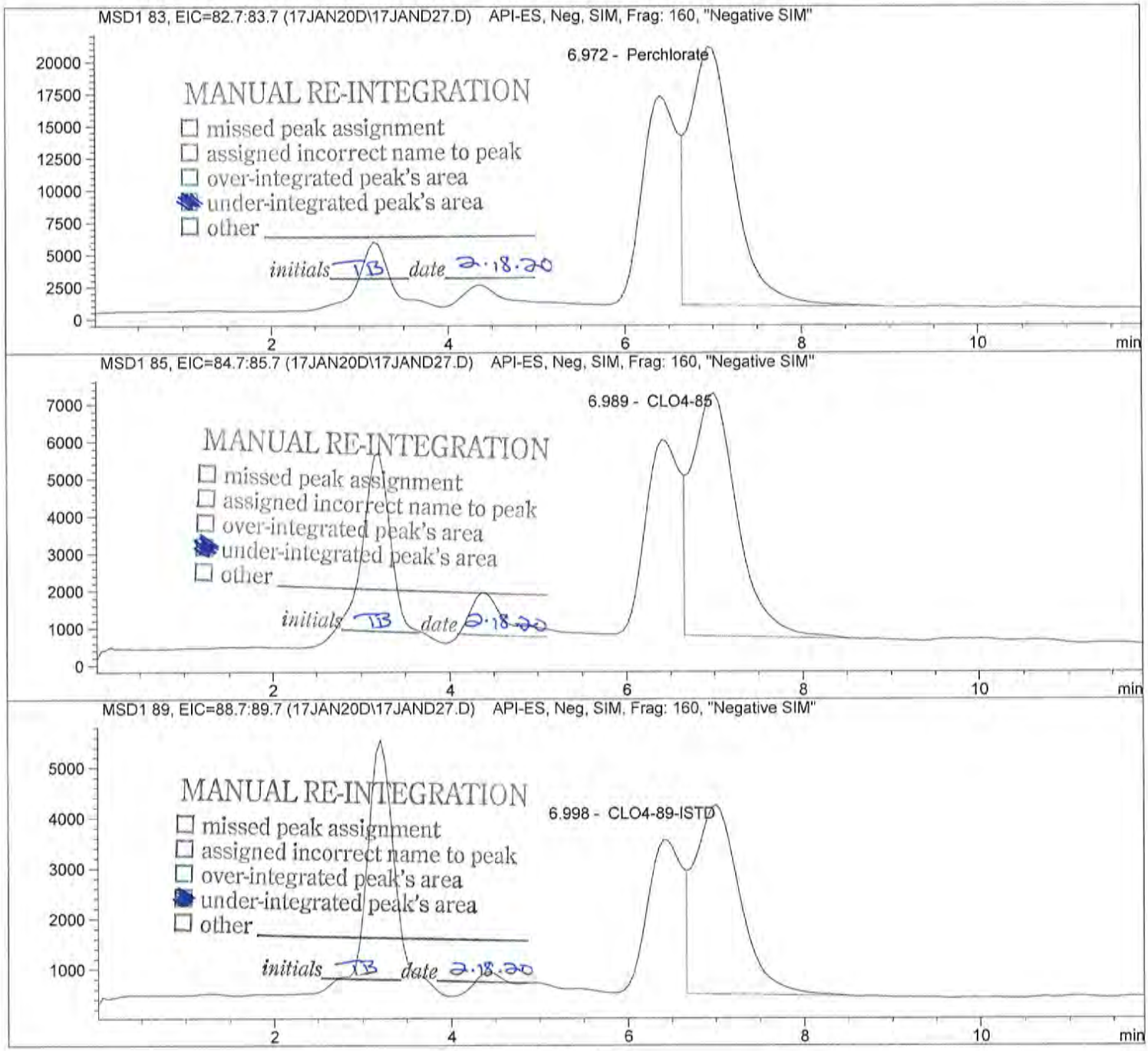
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND27.D Sample Name: 2004548008 RE

Injection Date:	2/17/2020 15:50:22	Seq Line:	27
Sample Name:	2004548008 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: 2/17/2020 15:42:52

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND27.D Sample Name: 2004548008 RE

Injection Date:	2/17/2020 15:50:22	Seq Line:	27
Sample Name:	2004548008 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: 2/17/2020 15:42:52

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
6.972	FM	697531.6	18.6067	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.989	FM	226846.6	19.7083	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.998	FM	131526.5	5.0000	CLO4-89-ISTD

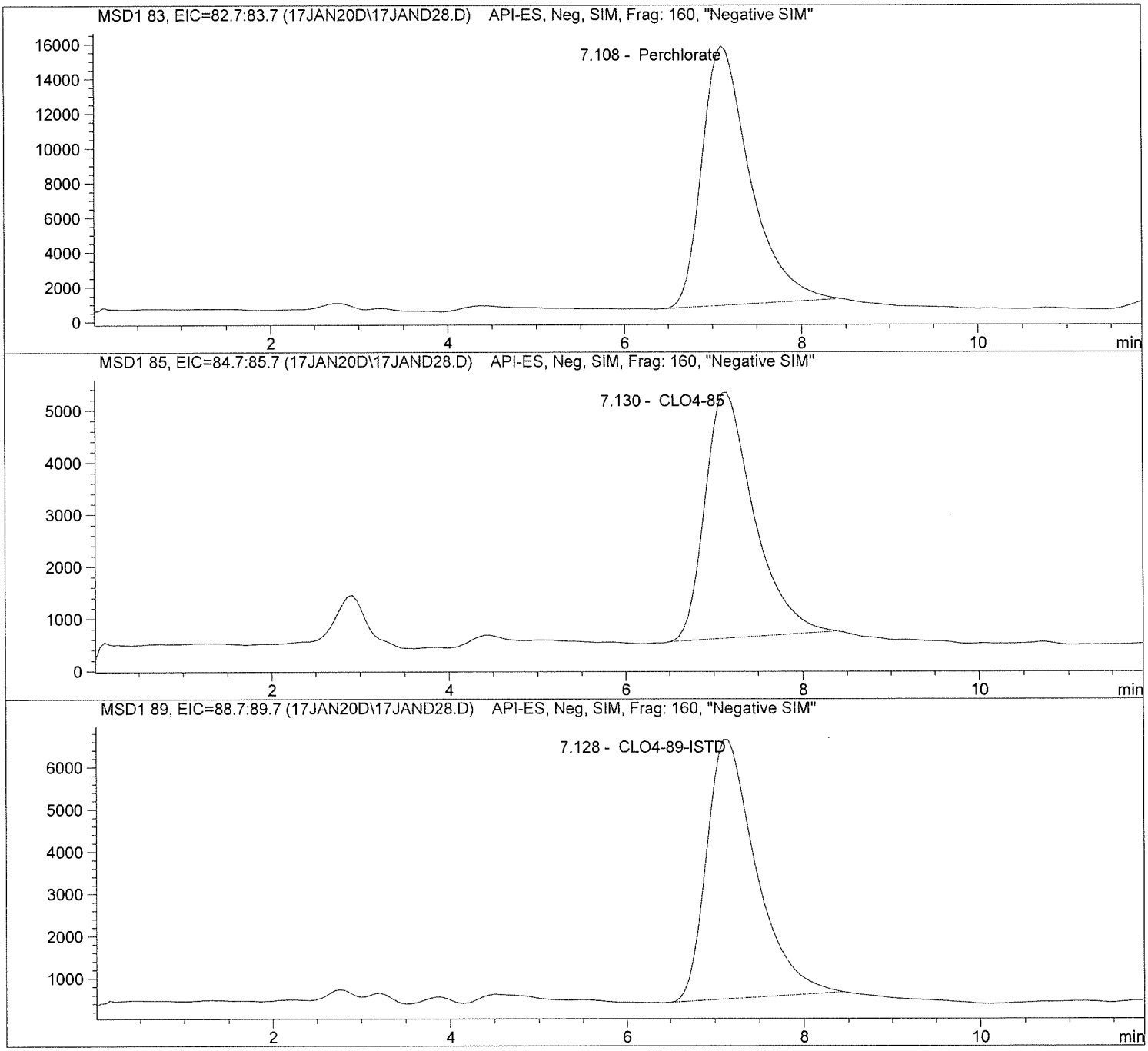
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND28.D Sample Name: 2004548012 10X

Injection Date:	2/17/2020 16:04:15	Seq Line:	28
Sample Name:	2004548012 10X	Location:	Vial 95
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 2/17/2020 15:42:52

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND28.D Sample Name: 2004548012 10X

Injection Date:	2/17/2020 16:04:15	Seq Line:	28
Sample Name:	2004548012 10X	Location:	Vial 95
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 2/17/2020 15:42:52

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
7.108	PBA	564189.9	86.4519	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.130	PBA	180716.6	89.7731	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.128	PBA	238166.1	50.0000	CLO4-89-ISTD

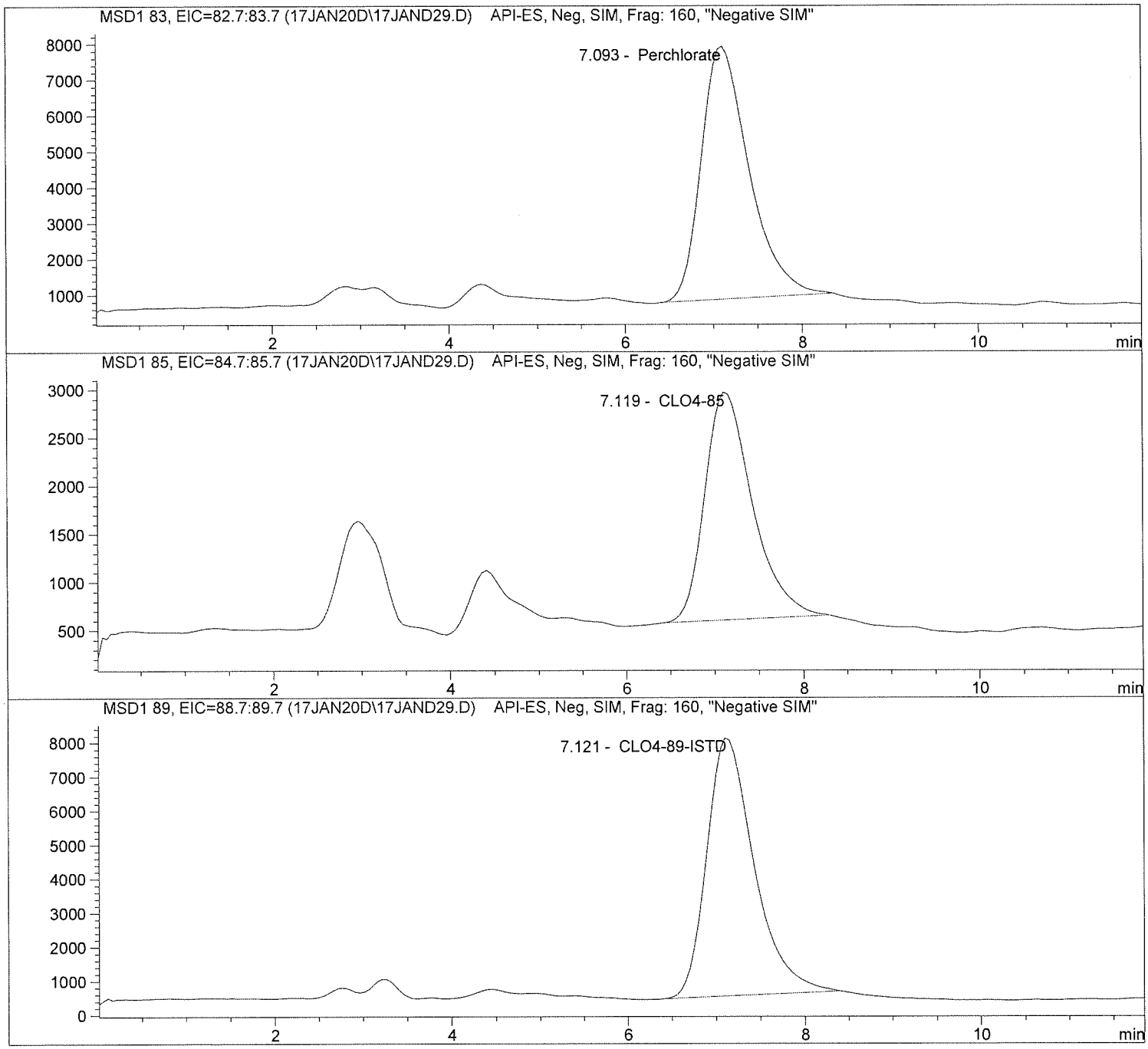
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND29.D Sample Name: 2004548008 5X

Injection Date:	2/17/2020 16:20:33	Seq Line:	29
Sample Name:	2004548008 5X	Location:	Vial 96
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 2/17/2020 15:42:52

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND29.D Sample Name: 2004548008 5X

Injection Date:	2/17/2020 16:20:33	Seq Line:	29
Sample Name:	2004548008 5X	Location:	Vial 96
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:	2/17/2020 15:42:52

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
7.093	PBA	264236.7	17.2945	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.119	BBA	88185.4	18.4759	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.121	PBA	281500.3	25.0000	CLO4-89-ISTD

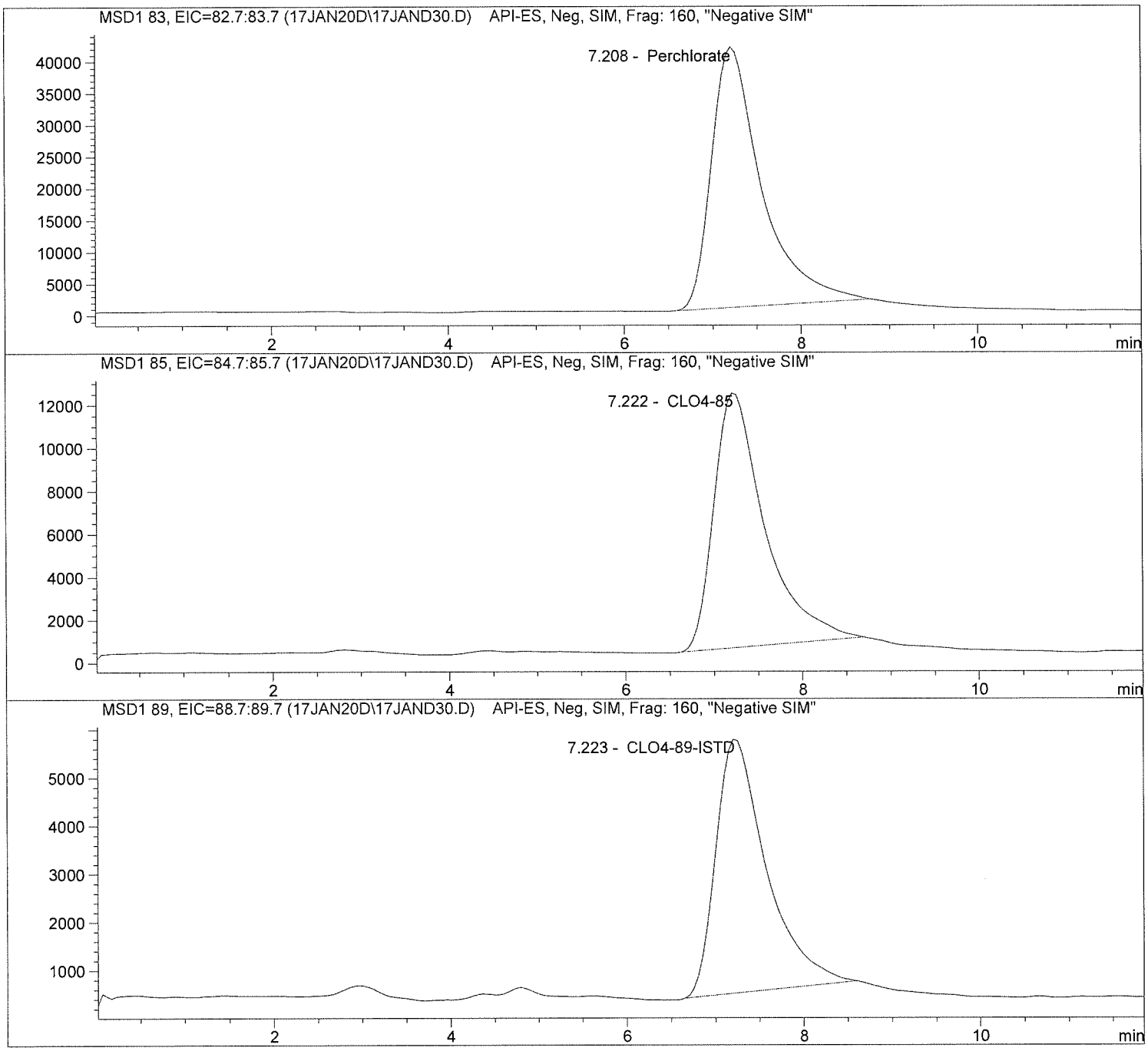
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND30.D Sample Name: 696082 CCV@25

Injection Date:	2/17/2020 16:34:25	Seq Line:	30
Sample Name:	696082 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: 2/17/2020 15:42:52

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND30.D Sample Name: 696082 CCV@25

Injection Date:	2/17/2020 16:34:25	Seq Line:	30
Sample Name:	696082 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: 2/17/2020 15:42:52

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
7.208	PBA	1618661.2	26.2692	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.222	PBA	474563.2	25.3555	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.223	PBA	209446.6	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
		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]	Sig	Lvl	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

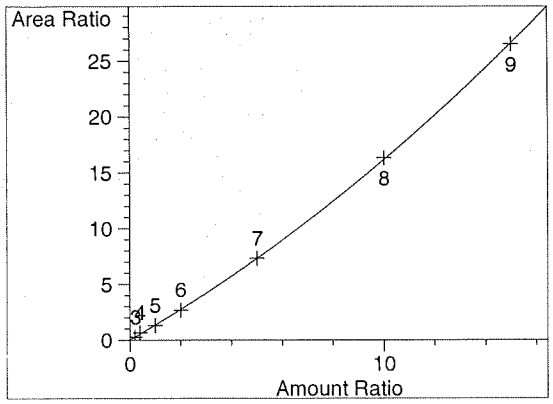
Compound: CLO4-89-ISTD
- Time Window : From 3.581 min To 11.896 min
- Curve Type : Linear
- Origin : Included
- Calibration Level Weights:/
  - Level 3 : 1
  - Level 4 : 1
  - Level 5 : 1
  - Level 6 : 1
  - Level 7 : 1
  - Level 8 : 1
  - Level 9 : 1

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

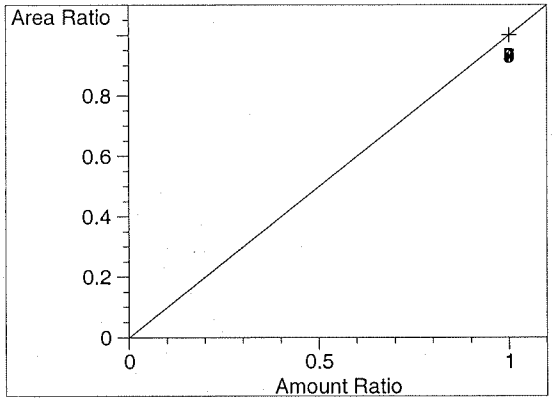
Peak Sum Table

No Entries in table

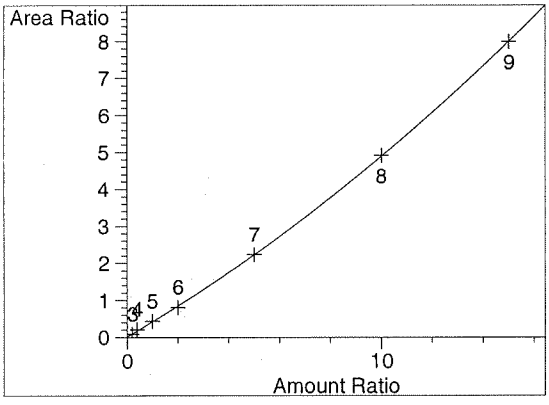
Calibration Curves



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:

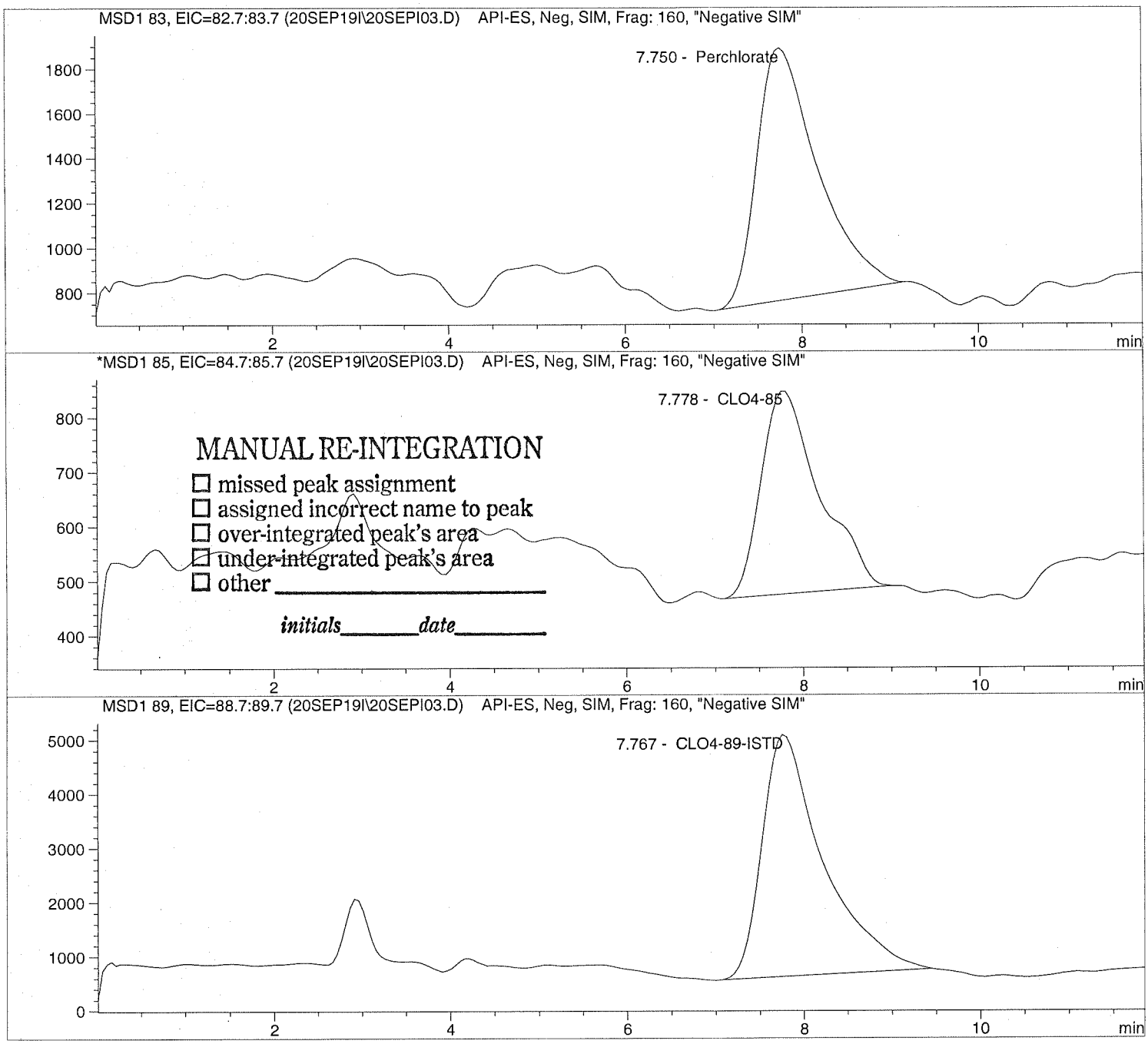
Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
1	Vial 71	CLO4@ 0.2ug/L	CLO4-AQN	1	Ctrl Samp		
2	Vial 72	CLO4@ 0.5ug/L	CLO4-AQN	1	Ctrl Samp		
3	Vial 73	CLO4@ 1.0ug/L	CLO4-AQN	1	Ctrl Samp		
4	Vial 74	CLO4@ 2.0ug/L	CLO4-AQN	1	Ctrl Samp		
5	Vial 75	CLO4@ 5.0ug/L	CLO4-AQN	1	Ctrl Samp		
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

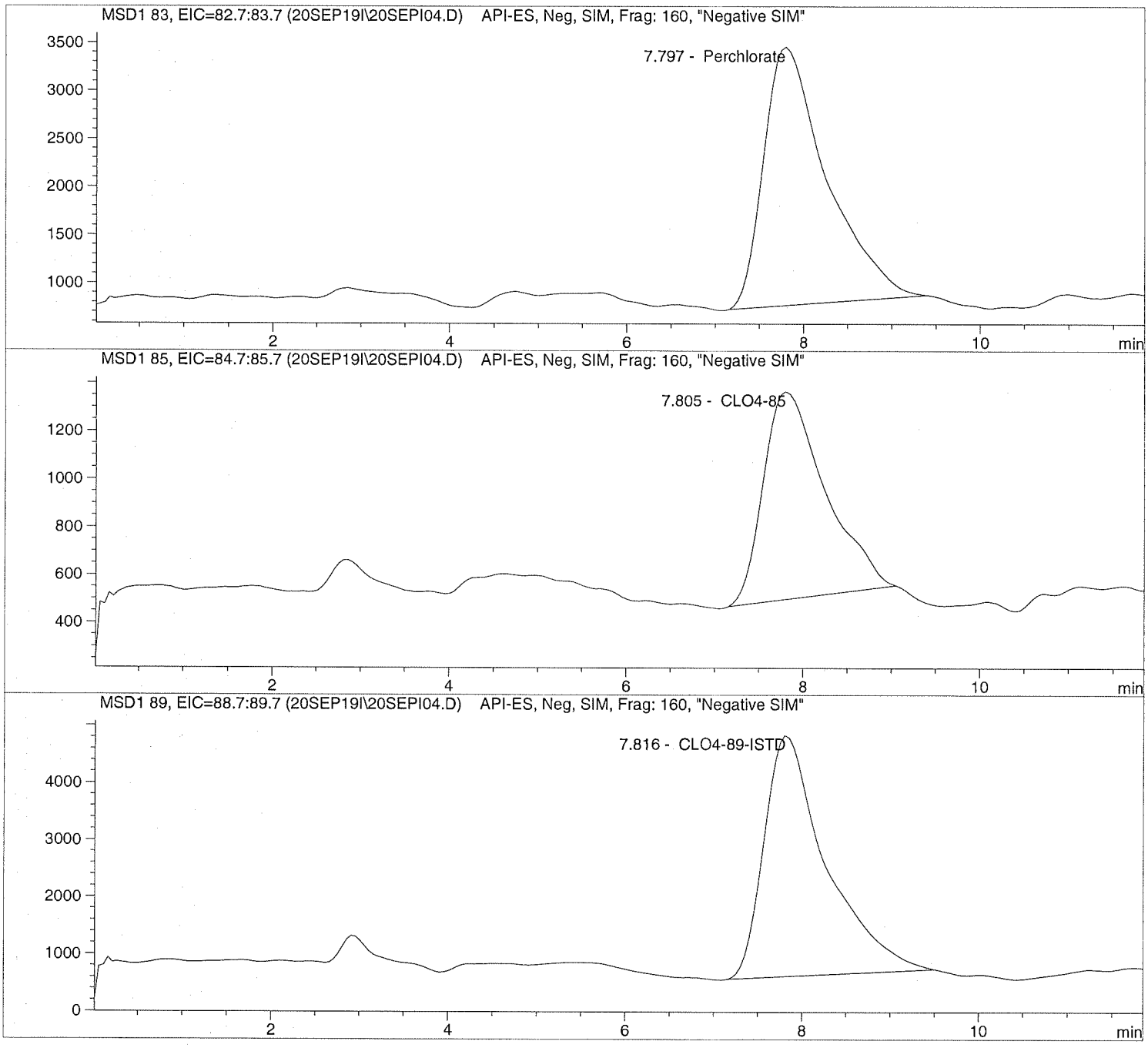
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI04.D Sample Name: CLO4@ 2.0ug/L

Injection Date:	9/20/2019 09:37:58	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

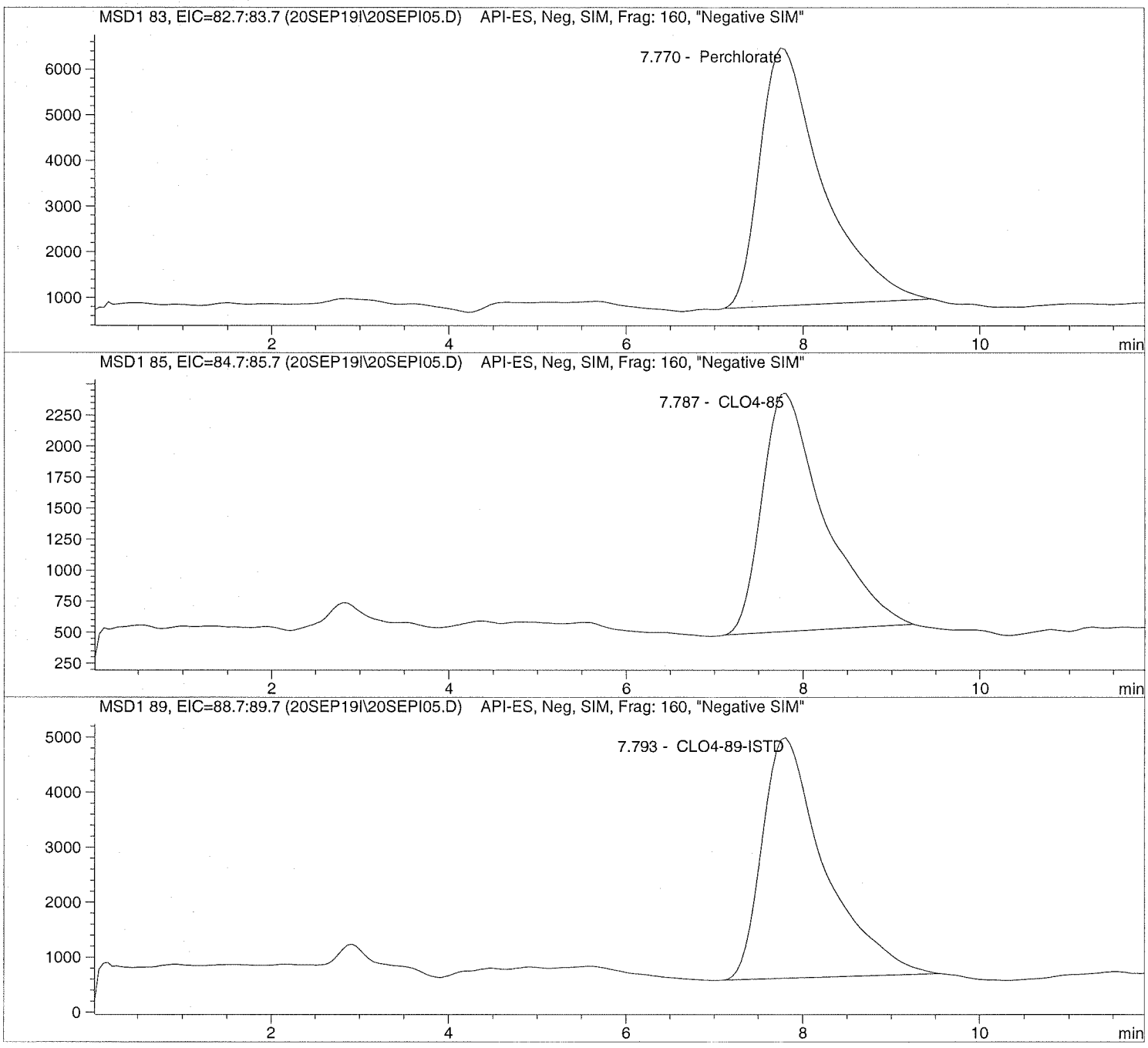
*** End of Report ***

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

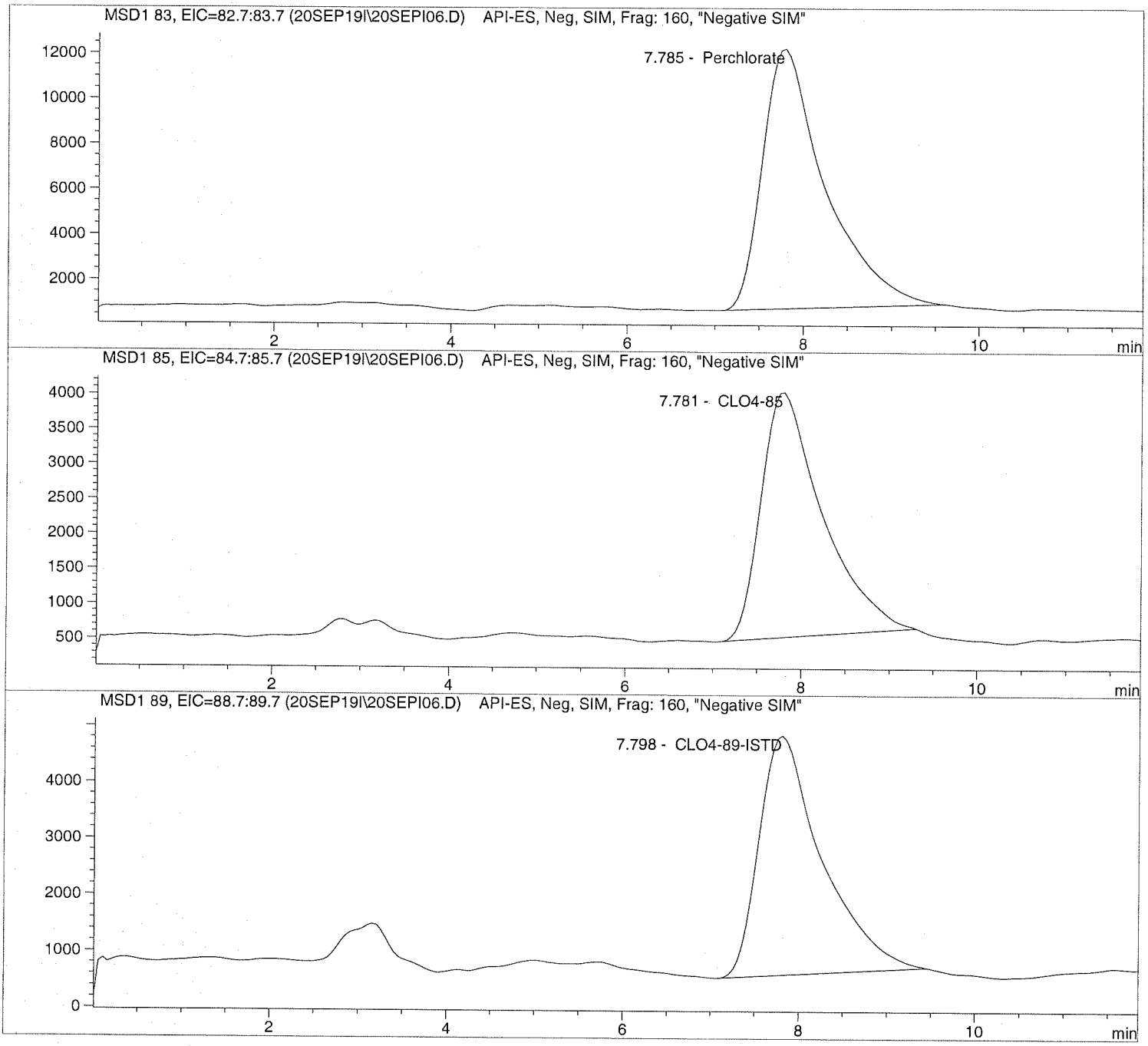
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI06.D Sample Name: CLO4@ 10.ug/L

Injection Date:	9/20/2019 10:05:36	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

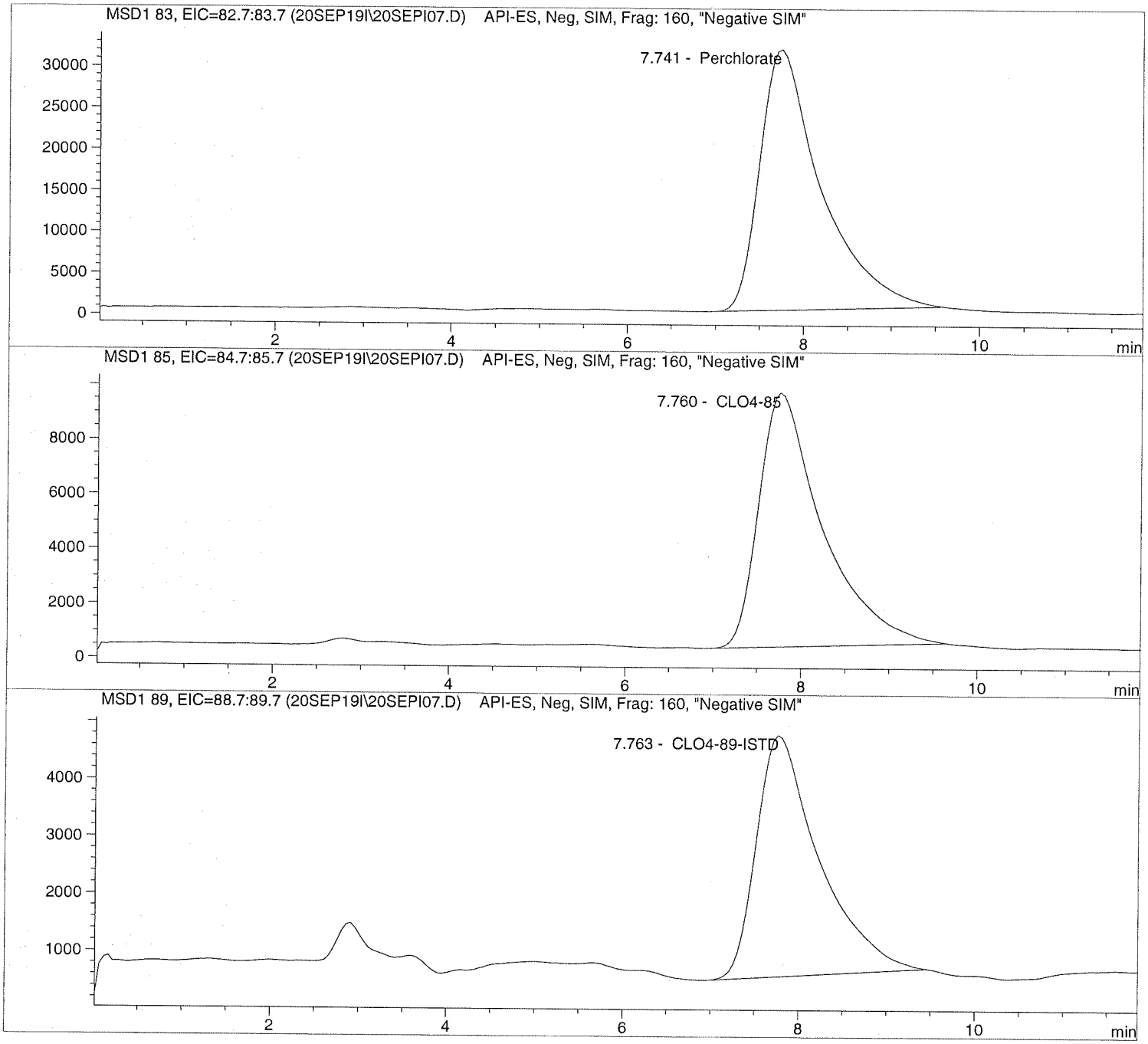
*** End of Report ***

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

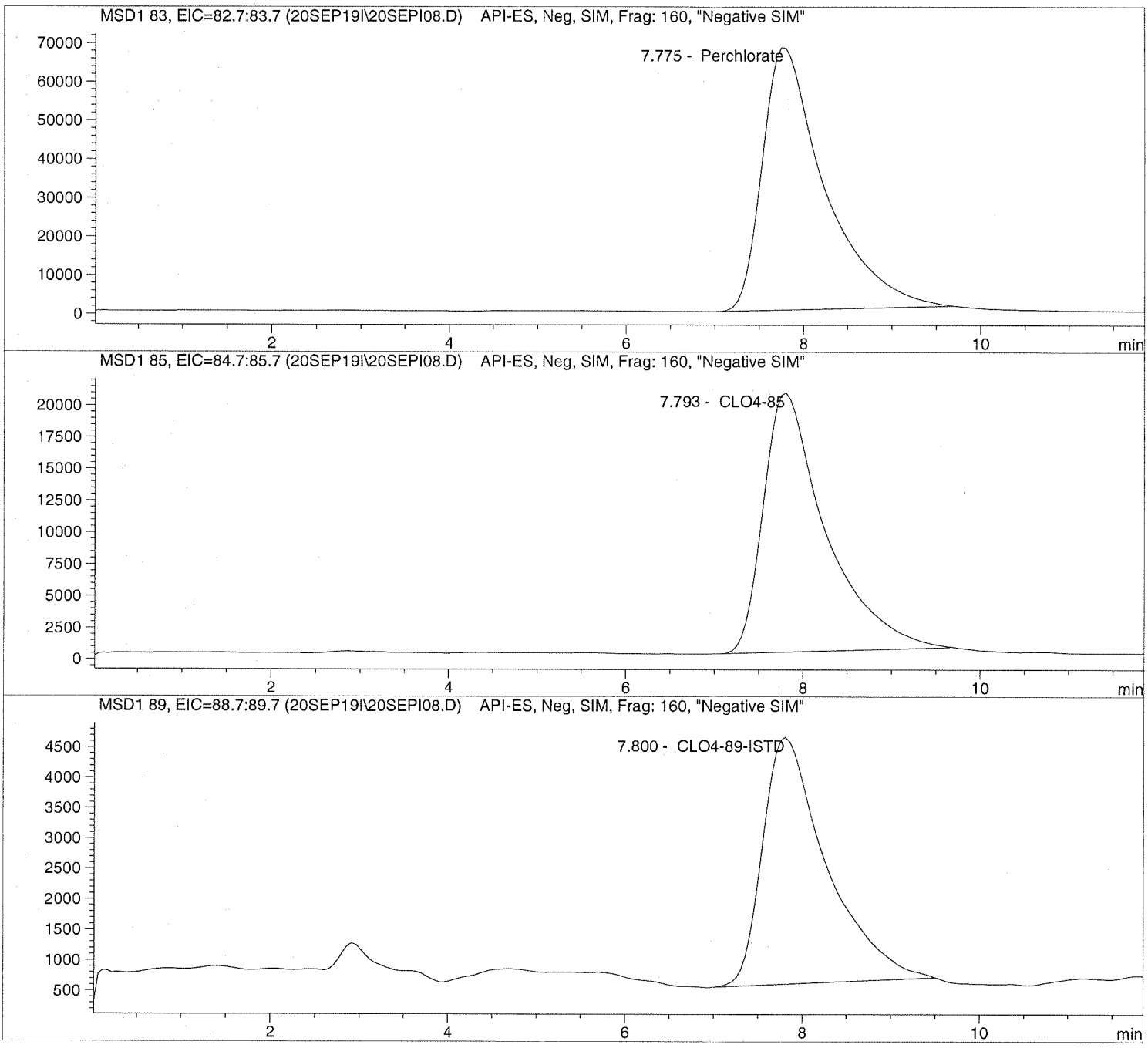
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\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

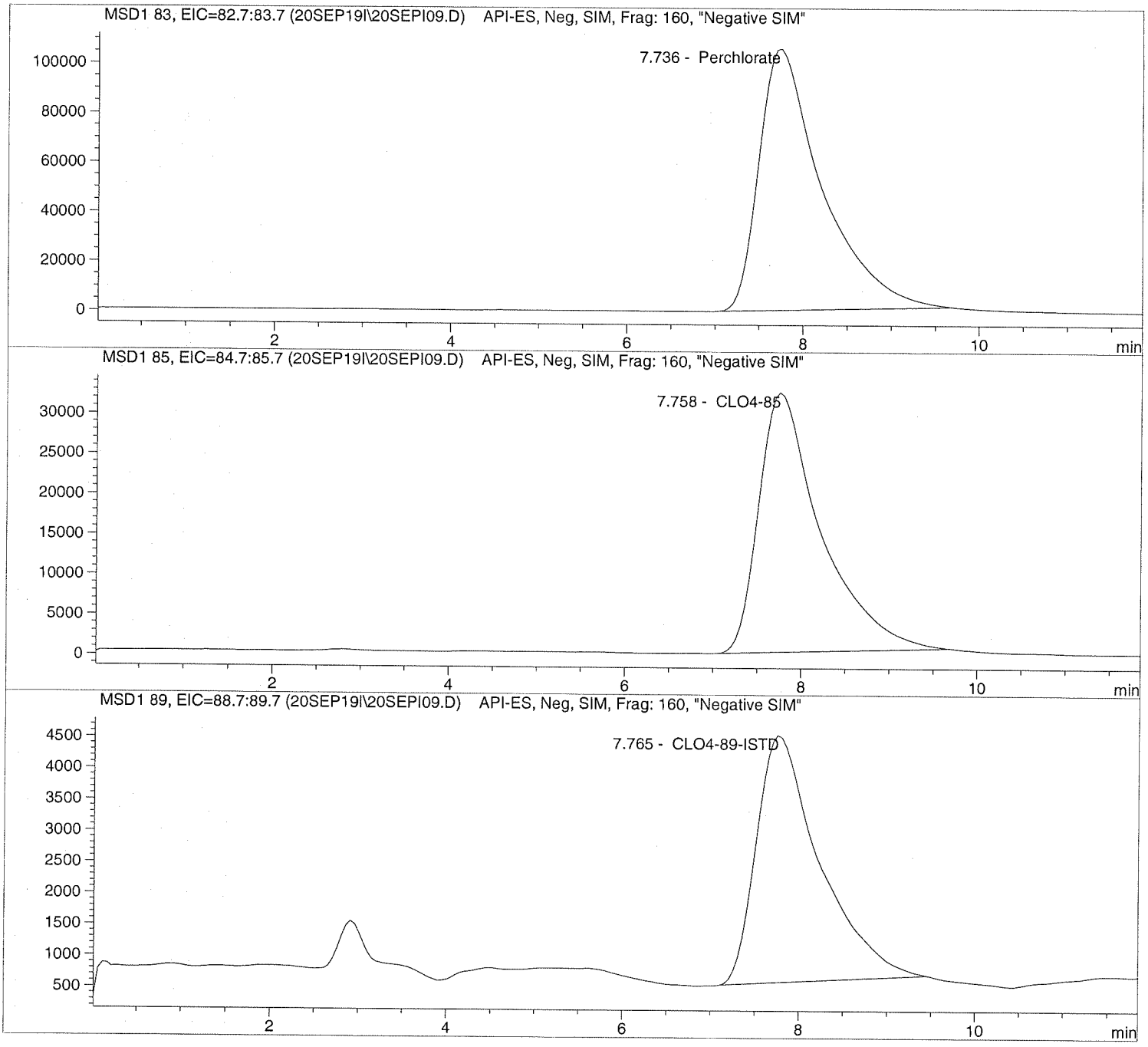
*** End of Report ***

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

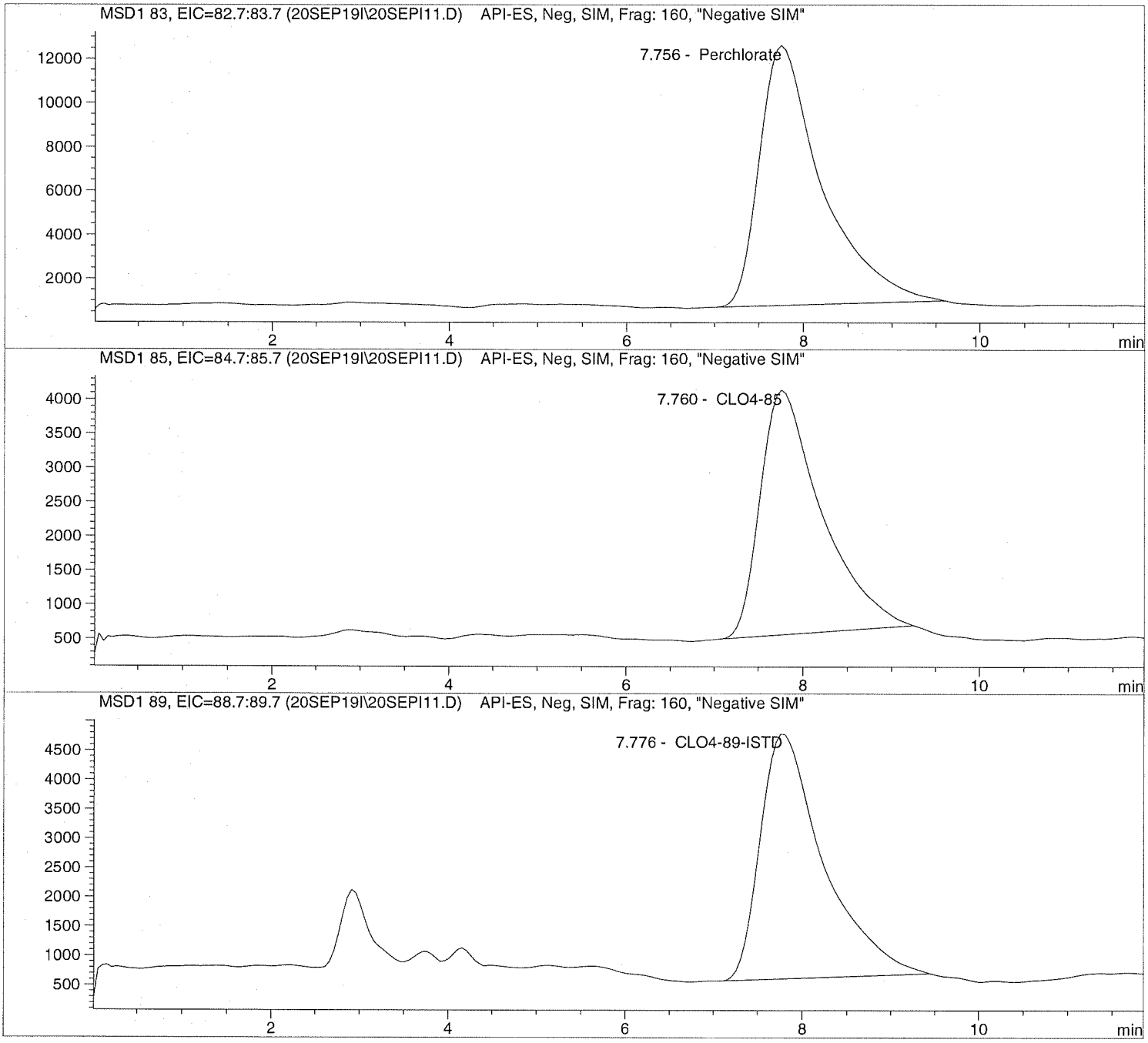
*** End of Report ***

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

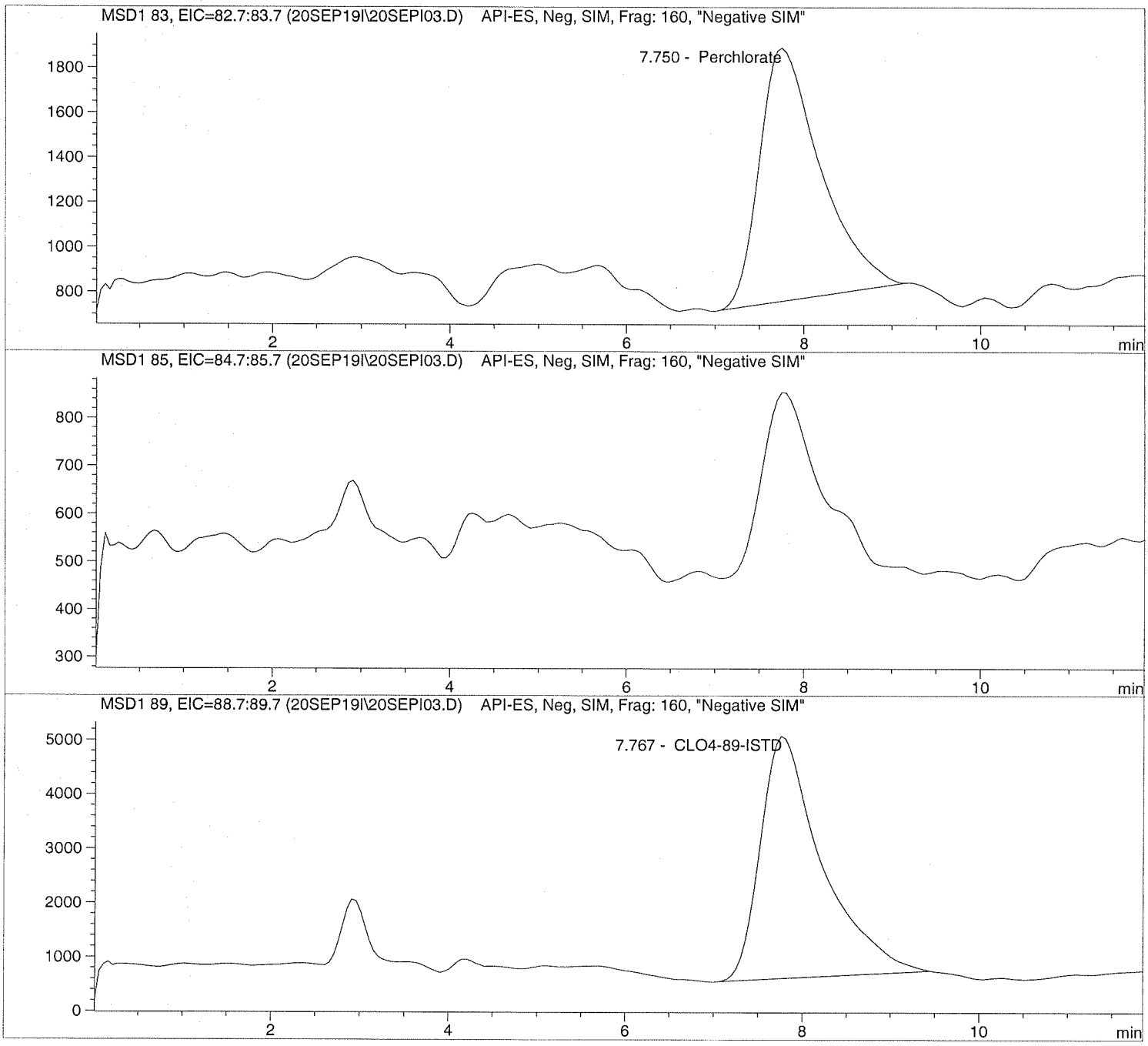
Unmodified

Data file: C:\HPCHEM\1\DATA\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

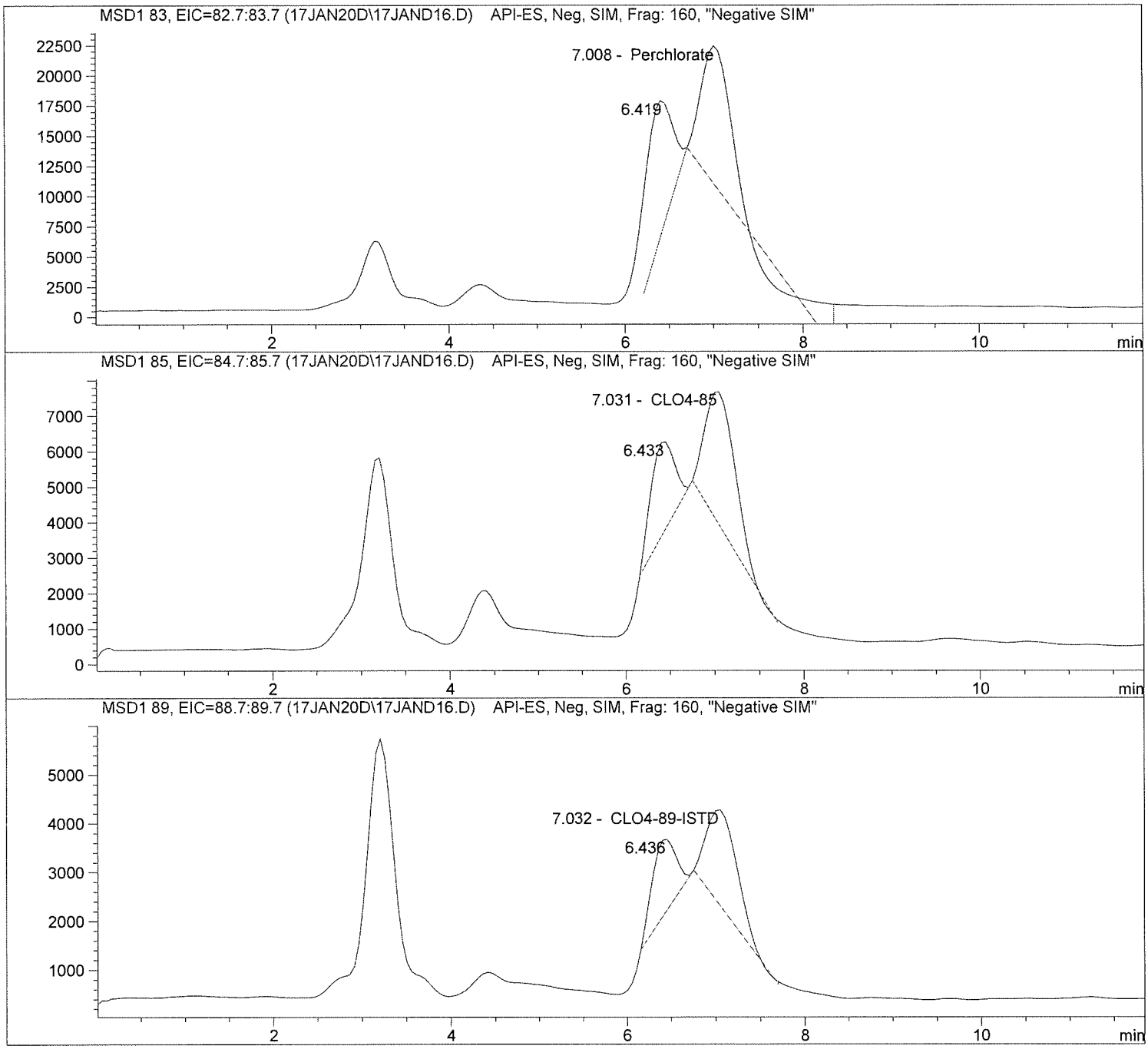
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND16.D Sample Name: 2004548008

Injection Date:	2/17/2020 12:16:47	Seq Line:	16
Sample Name:	2004548008	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: 2/17/2020 15:42:52

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND16.D Sample Name: 2004548008

Injection Date:	2/17/2020 12:16:47	Seq Line:	16
Sample Name:	2004548008	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:	2/17/2020 15:42:52

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
6.419	PB	209415.0	0.0000	
7.008	VBA	265970.0	19.8263	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.433	PB	48374.9	0.0000	
7.031	VBA	86453.2	20.9963	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.436	PB	28797.6	0.0000	
7.032	VBA	46829.2	5.0000	CLO4-89-ISTD

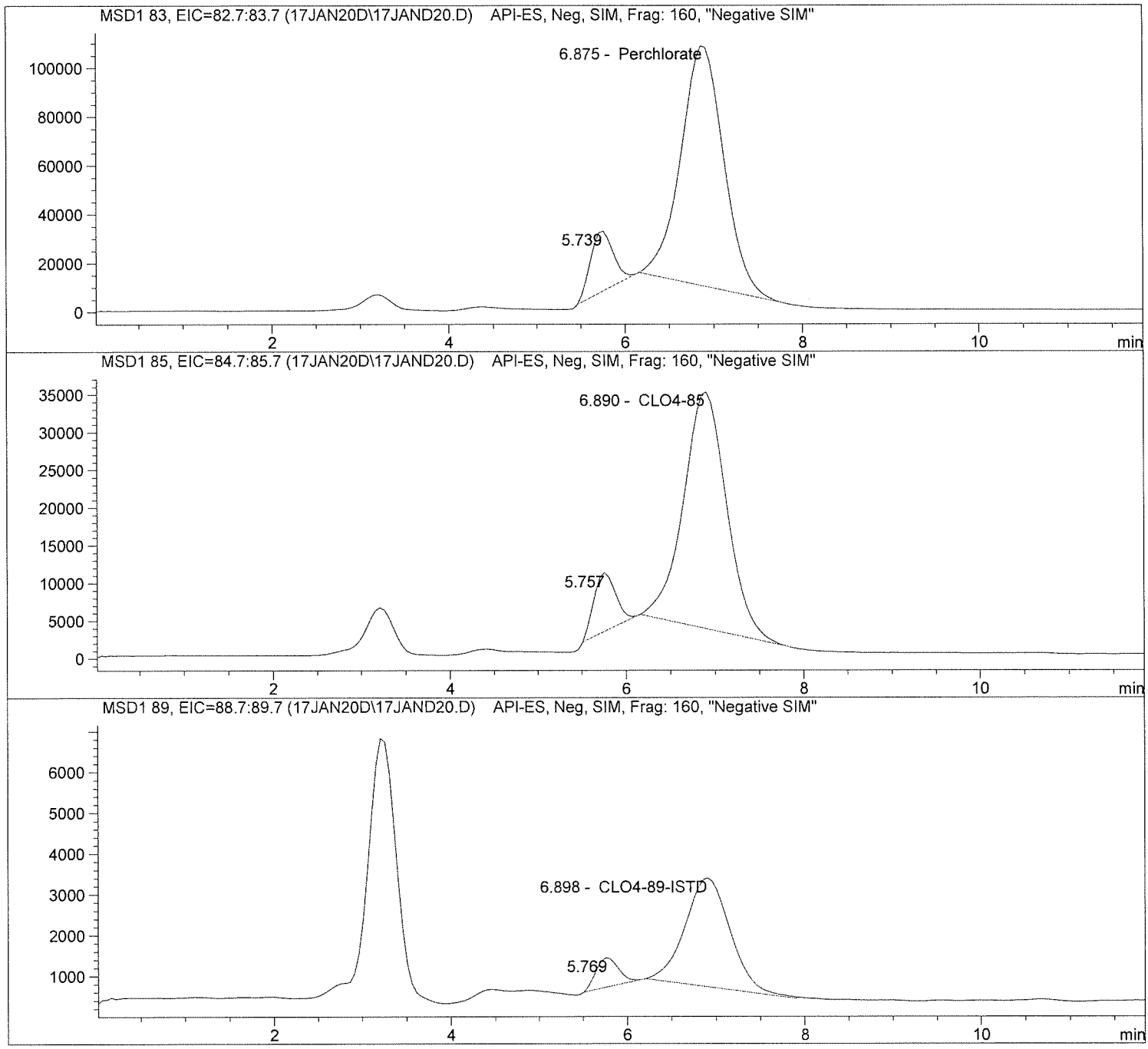
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND20.D Sample Name: 2004548012

Injection Date:	2/17/2020 13:12:19	Seq Line:	20
Sample Name:	2004548012	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: 2/17/2020 15:42:52

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND20.D Sample Name: 2004548012

Injection Date:	2/17/2020 13:12:19	Seq Line:	20
Sample Name:	2004548012	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: 2/17/2020 15:42:52

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
5.739	PB	449533.1	0.0000	
6.875	VBA	3313307.8	93.7006	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
5.757	PB	133767.0	0.0000	
6.890	VBA	1061136.6	98.5589	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
5.769	PB	12736.1	0.0000	
6.898	VBA	93711.6	5.0000	CLO4-89-ISTD

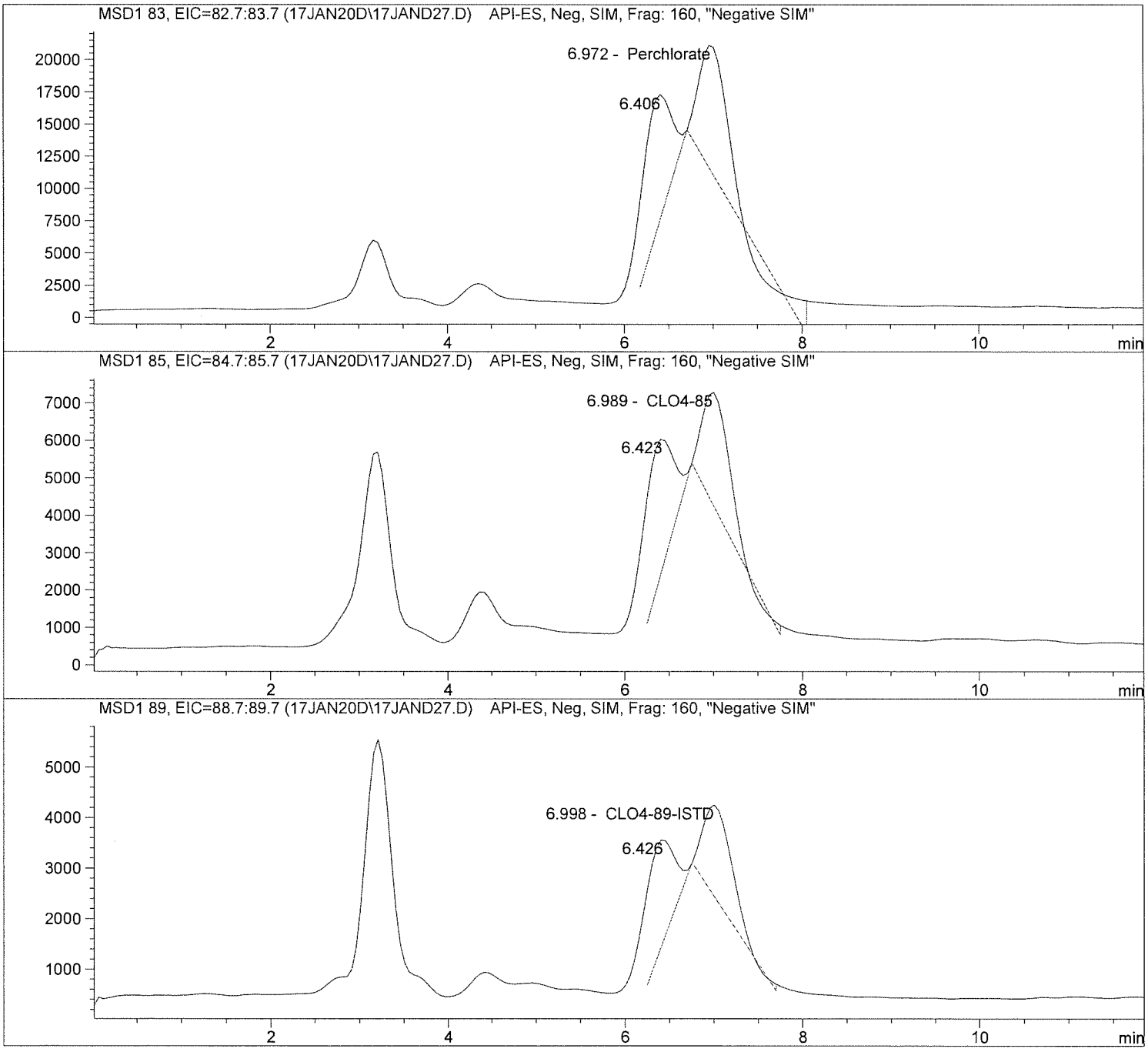
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND27.D Sample Name: 2004548008 RE

Injection Date:	2/17/2020 15:50:22	Seq Line:	27
Sample Name:	2004548008 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: 2/17/2020 15:42:52

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND27.D Sample Name: 2004548008 RE

Injection Date:	2/17/2020 15:50:22	Seq Line:	27
Sample Name:	2004548008 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: 2/17/2020 15:42:52

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
6.406	PB	201025.8	0.0000	
6.972	VBA	206483.3	17.6236	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.423	PB	66713.4	0.0000	
6.989	VBA	62789.6	17.5220	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.426	PB	39075.6	0.0000	
6.998	VBA	41273.5	5.0000	CLO4-89-ISTD

*** End of Report ***

ALS Environmental
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February 20, 2020

Analytical Report for Service Request No: K2001390

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

RE: HS20020473

Dear RJ,

Enclosed are the results of the sample(s) submitted to our laboratory February 14, 2020
For your reference, these analyses have been assigned our service request number **K2001390.**

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. All results are intended to be considered in their entirety, and ALS Group USA Corp. dba ALS Environmental (ALS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please contact me if you have any questions. My extension is 3350. You may also contact me via email at Kelley.Lovejoy@alsglobal.com.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Kelley Lovejoy

Kelley Lovejoy
Project Manager

RIGHT SOLUTIONS | RIGHT PARTNER

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Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LOD	Limit of Detection
LOQ	Limit of Quantitation
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

Inorganic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
E	The result is an estimate amount because the value exceeded the instrument calibration range.
J	The result is an estimated value.
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
i	The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
X	See case narrative.
Q	See case narrative. One or more quality control criteria was outside the limits.
H	The holding time for this test is immediately following sample collection. The samples were analyzed as soon as possible after receipt by the laboratory.

Metals Data Qualifiers

#	The control limit criteria is not applicable. See case narrative.
J	The result is an estimated value.
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
M	The duplicate injection precision was not met.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.
S	The reported value was determined by the Method of Standard Additions (MSA).
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
i	The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
X	See case narrative.
+	The correlation coefficient for the MSA is less than 0.995.
Q	See case narrative. One or more quality control criteria was outside the limits.

Organic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
A	A tentatively identified compound, a suspected aldol-condensation product.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
C	The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
D	The reported result is from a dilution.
E	The result is an estimated value.
J	The result is an estimated value.
N	The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
P	The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results.
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
i	The MRL/MDL or LOQ/LOD is elevated due to a chromatographic interference.
X	See case narrative.
Q	See case narrative. One or more quality control criteria was outside the limits.

Additional Petroleum Hydrocarbon Specific Qualifiers

F	The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
L	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
H	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
O	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
Y	The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
Z	The chromatographic fingerprint does not resemble a petroleum product.

ALS Group USA Corp. dba ALS Environmental (ALS) - Kelso
State Certifications, Accreditations, and Licenses

Agency	Web Site	Number
Alaska DEH	http://dec.alaska.gov/eh/lab/cs/csapproval.htm	UST-040
Arizona DHS	http://www.azdhs.gov/lab/license/env.htm	AZ0339
Arkansas - DEQ	http://www.adeq.state.ar.us/techsvs/labcert.htm	88-0637
California DHS (ELAP)	http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx	2795
DOD ELAP	http://www.denix.osd.mil/edqw/Accreditation/AccreditedLabs.cfm	L16-58-R4
Florida DOH	http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm	E87412
Hawaii DOH	http://health.hawaii.gov/	-
ISO 17025	http://www.pjlabs.com/	L16-57
Louisiana DEQ	http://www.deq.louisiana.gov/page/la-lab-accreditation	03016
Maine DHS	http://www.maine.gov/dhhs/	WA01276
Minnesota DOH	http://www.health.state.mn.us/accreditation	053-999-457
Nevada DEP	http://ndep.nv.gov/bsdw/labservice.htm	WA01276
New Jersey DEP	http://www.nj.gov/dep/enforcement/oqa.html	WA005
New York - DOH	https://www.wadsworth.org/regulatory/elap	12060
North Carolina DEQ	https://deq.nc.gov/about/divisions/water-resources/water-resources-data/water-sciences-home-page/laboratory-certification-branch/non-field-lab-certification	605
Oklahoma DEQ	http://www.deq.state.ok.us/CSDnew/labcert.htm	9801
Oregon – DEQ (NELAP)	http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	WA100010
South Carolina DHEC	http://www.scdhec.gov/environment/EnvironmentalLabCertification/	61002
Texas CEQ	http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html	T104704427
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C544
Wyoming (EPA Region 8)	https://www.epa.gov/region8-waterops/epa-region-8-certified-drinking-water-	-
Kelso Laboratory Website	www.alsglobal.com	NA

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. A complete listing of specific NELAP-certified analytes, can be found in the certification section at www.ALSGlobal.com or at the accreditation bodies web site.
Please refer to the certification and/or accreditation body's web site if samples are submitted for compliance purposes. The states highlighted above, require the analysis be listed on the state certification if used for compliance purposes and if the method/anlayte is offered by that state.

Case Narrative

ALS Environmental—Kelso Laboratory
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ALS Environmental

Client: ALS Environmental - US
Project: HS20020473
Sample Matrix: Water

Service Request: K2001390
Date Received: 02/14/2020

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:

One water sample was received for analysis at ALS Environmental on 02/14/2020. Any discrepancies upon initial sample inspection are annotated on the sample receipt and preservation form included within this report. The sample was stored at minimum in accordance with the analytical method requirements.

General Chemistry:

No significant anomalies were noted with this analysis.

Approved by Kelley Lovejoy Date 02/20/2020

Chain of Custody

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
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K2001390

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Houston, TX 77099
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F: +1 281 530 5887
www.alsglobal.com

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID:** **13318**

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:	
Email:	

INVOICE INFORMATION:

Company:	ALS Houston
Contact:	Accounts Payable
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Reference:	HS20020473
TSR:	Danielle Winnings

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS20020473-01**	**LH18/24-SP650_021120**	**Water**	**11 Feb 2020 14:00**
	TOC Analysis for DOD Level IV			20 Feb 2020

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. Modashia Date/Time: 02/13/2020 18:00

Received By: K Morrow ALS Kelso Date/Time: 2/14/20 0955

Cooler ID(s): Temperature(s):

PC KL

Cooler Receipt and Preservation Form

Client ALS - Houston Service Request *K20* 01390

Received: 2/14/20 Opened: 2/14/20 By: [signature] Unloaded: 2/14/20 By: [signature]

1. Samples were received via? *USPS* (*Fed Ex*) *UPS* *DHL* *PDX* *Courier* *Hand Delivered*
2. Samples were received in: (circle) (*Cooler*) *Box* *Envelope* *Other* _____ *NA*
3. Were custody seals on coolers? NA (Y) N If yes, how many and where? 2 front
   If present, were custody seals intact? (Y) N If present, were they signed and dated? (Y) N

Raw Cooler Temp	Corrected Cooler Temp	Raw Temp Blank	Corrected Temp Blank	Corr. Factor	Thermometer ID	Cooler/COC ID NA	Tracking Number NA	File
0.8	0.5	—	—	+0.3	401	13318	125102945333	

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

Sample ID on Bottle	Sample ID on COC	Identified by:

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

Notes, Discrepancies, & Resolutions: _____

General Chemistry

ALS Environmental—Kelso Laboratory
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ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	K2001390
Project:	HS20020473	**Date Collected:**	02/11/20
Sample Matrix:	Water	**Date Received:**	02/14/20
Analysis Method:	SM 5310 C	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA

Carbon, Total Organic

Sample Name	Lab Code	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
LH18/24-SP650_021120	K2001390-001	**1.66**	0.50	0.20	0.07	1	02/18/20 16:23	
Method Blank	K2001390-MB	ND U	0.50	0.20	0.07	1	02/18/20 14:42	

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	K2001390
Project	HS20020473	**Date Collected:**	02/11/20
Sample Matrix:	Water	**Date Received:**	02/14/20
		Date Analyzed:	02/18/20

Replicate Sample Summary
General Chemistry Parameters

Sample Name:	LH18/24-SP650_021120	**Units:**	mg/L
Lab Code:	K2001390-001	**Basis:**	NA

Analyte Name	Analysis Method	LOQ	LOD	MDL	Sample Result	Duplicate Sample K2001390-001DUP Result	Average	RPD	RPD Limit
Carbon, Total Organic	SM 5310 C	0.50	0.20	0.07	1.66	1.59	1.62	4	10

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

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

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

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	K2001390
Project:	HS20020473	**Date Analyzed:**	02/18/20
Sample Matrix:	Water	**Date Extracted:**	NA

Lab Control Sample Summary
Carbon, Total Organic

Analysis Method:	SM 5310 C	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA
		Analysis Lot:	670484

Sample Name	Lab Code	Result	Spike Amount	% Rec	% Rec Limits
Lab Control Sample	K2001390-LCS	24.3	25.0	97	83-117

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US **Service Request:** K2001390
Project: HS20020473

Continuing Calibration Verification (CCV) Summary

Carbon, Total Organic

Analysis Method: SM 5310 C **Units:** mg/L

	Analysis Lot	Lab Code	Date Analyzed	True Value	Measured Value	Percent Recovery	Acceptance Limits
CCV1	670484	KQ2002367-01	02/18/20 14:12	25.0	26.2	105	90-110
CCV2	670484	KQ2002367-02	02/18/20 18:15	25.0	26.1	104	90-110
CCV3	670484	KQ2002367-03	02/18/20 21:34	25.0	26.0	104	90-110

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US **Service Request:**K2001390
Project: HS20020473

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	670484	KQ2002367-04	02/18/20 14:27	0.50	0.20	0.07	ND	U
CCB2	670484	KQ2002367-05	02/18/20 18:30	0.50	0.20	0.07	ND	U
CCB3	670484	KQ2002367-06	02/18/20 21:49	0.50	0.20	0.07	ND	U

Raw Data

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General Chemistry

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Work Request # Original ( ) K2001335, 1390, 1429,
II IV IV

Tier:

Date Analyzed: 2/18/20

Analyst: BCP

Run # 670484

Analysis: TOC

DATA QUALITY REPORT
INORGANICS

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

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

COMMENTS:

Final Approved by: [signature] Date: 02/20/20

DQREPORT

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 670484 **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
K2001335-003	Carbon, Total Organic	N/A		Water	4.70 mg/L	10 mL	4.70 mg/L	1	0.07	0.50			2/18/20 16:51:00	N	II
K2001390-001	Carbon, Total Organic	N/A		Water	1.66 mg/L	10 mL	1.66 mg/L	1	0.07	0.50			2/18/20 16:23:00	N	IV
K2001429-001	Carbon, Total Organic	N/A		Ground Water	3.89 mg/L	10 mL	3.89 mg/L	1	0.07	0.50			2/18/20 17:19:00	N	IV
K2001429-002	Carbon, Total Organic	N/A		Ground Water	4.05 mg/L	10 mL	4.05 mg/L	1	0.07	0.50			2/18/20 17:47:00	N	IV
K2001429-003	Carbon, Total Organic	N/A		Ground Water	11.69 mg/L	10 mL	11.7 mg/L	1	0.07	0.50			2/18/20 18:44:00	N	IV
K2001429-004	Carbon, Total Organic	N/A		Ground Water	4.74 mg/L	10 mL	4.74 mg/L	1	0.07	0.50			2/18/20 19:13:00	N	IV
K2001429-005	Carbon, Total Organic	N/A		Ground Water	9.99 mg/L	10 mL	9.99 mg/L	1	0.07	0.50			2/18/20 19:41:00	N	IV
K2001429-006	Carbon, Total Organic	N/A		Ground Water	1.81 mg/L	10 mL	1.81 mg/L	1	0.07	0.50			2/18/20 20:09:00	N	IV
K2001429-007	Carbon, Total Organic	N/A		Ground Water	2.40 mg/L	10 mL	2.40 mg/L	1	0.07	0.50			2/18/20 20:37:00	Y	IV
KQ2002367-01	Carbon, Total Organic	CCV		Ground Water	26.24 mg/L	10 mL	26.2 mg/L	1					2/18/20 14:12:00	N	IV
KQ2002367-02	Carbon, Total Organic	CCV		Ground Water	26.11 mg/L	10 mL	26.1 mg/L	1					2/18/20 18:15:00	N	IV
KQ2002367-03	Carbon, Total Organic	CCV		Ground Water	25.99 mg/L	10 mL	26.0 mg/L	1					2/18/20 21:34:00	N	IV
KQ2002367-04	Carbon, Total Organic	CCB		Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			2/18/20 14:27:00	N	IV
KQ2002367-05	Carbon, Total Organic	CCB		Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			2/18/20 18:30:00	N	IV
KQ2002367-06	Carbon, Total Organic	CCB		Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			2/18/20 21:49:00	N	IV
KQ2002367-07	Carbon, Total Organic	MB		Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			2/18/20 14:42:00	N	IV
KQ2002367-08	Carbon, Total Organic	LCS		Ground Water	24.27 mg/L	10 mL	24.3 mg/L	1	0.07	0.50	97		2/18/20 14:56:00	N	IV
KQ2002367-10	Carbon, Total Organic	MS	K2001429-007	Water	30.24 mg/L	10 mL	30.2 mg/L	1	0.07	0.50	111		2/18/20 21:05:00	N	IV
KQ2002367-12	Carbon, Total Organic	DUP	K2001335-003	Water	4.66 mg/L	10 mL	4.66 mg/L	1	0.07	0.50		<1	2/18/20 16:51:00	N	II
KQ2002367-13	Carbon, Total Organic	DUP	K2001390-001	Water	1.59 mg/L	10 mL	1.59 mg/L	1	0.07	0.50		4	2/18/20 16:23:00	N	IV
KQ2002367-14	Carbon, Total Organic	DUP	K2001429-002	Water	4.03 mg/L	10 mL	4.03 mg/L	1	0.07	0.50		<1	2/18/20 17:47:00	N	IV
KQ2002367-15	Carbon, Total Organic	DUP	K2001429-001	Water	4.07 mg/L	10 mL	4.07 mg/L	1	0.07	0.50		5	2/18/20 17:19:00	N	IV
KQ2002367-16	Carbon, Total Organic	DUP	K2001429-003	Water	11.77 mg/L	10 mL	11.8 mg/L	1	0.07	0.50		<1	2/18/20 18:44:00	N	IV
KQ2002367-17	Carbon, Total Organic	DUP	K2001429-004	Water	4.58 mg/L	10 mL	4.58 mg/L	1	0.07	0.50		3	2/18/20 19:13:00	N	IV
KQ2002367-18	Carbon, Total Organic	DUP	K2001429-005	Water	10.04 mg/L	10 mL	10.0 mg/L	1	0.07	0.50		<1	2/18/20 19:41:00	N	IV
KQ2002367-19	Carbon, Total Organic	DUP	K2001429-006	Water	1.77 mg/L	10 mL	1.77 mg/L	1	0.07	0.50		2	2/18/20 20:09:00	N	IV
KQ2002367-20	Carbon, Total Organic	DUP	K2001429-007	Water	2.39 mg/L	10 mL	2.39 mg/L	1	0.07	0.50		<1	2/18/20 20:37:00	N	IV

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

02/20/20

TOC: 670484

Schedule: 02182020

Version: 2
Instrument: Fusion1
Last Saved by: Fusion1 (Fusion1)
Last Saved on: 2020/02/18 12:18 - 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)	1	True	Ready
C	Check Standard	[TOC] LCS [24.0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
2	Sample	ICS	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
3	Sample	K2000749-001.04	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
4	Sample	K2000749-001.04 ms 4x	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
5	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
6	Sample	K2001390-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
7	Sample	K2001335-003.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
8	Sample	K2001429-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
9	Sample	K2001429-002.01	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
10	Sample	K2001429-003.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
11	Sample	K2001429-004.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
12	Sample	K2001429-005.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
13	Sample	K2001429-006.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
14	Sample	K2001429-007.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
15	Sample	K2001429-007.01 ms	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
16	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
					False	

02/20/20

Fusion Report - 02182020
Tuesday, February 18, 2020 12:18 PM

(View - Reps, Unused Reps, Meta-Data, Signature, History)
Printed on 2020/02/19 12:46 - Wednesday

Report Summary Information

Company Location:	Gen Chem Lab		
Schedule Name:	02182020	Engine Version:	1.1.5.1
Instrument Name:	Fusion1	Firmware Version:	1.2.0696
Report Version:	1 of 1	Connection:	RS232 COM1
Report Creation by Operators (schedule version):	Fusion1 (Fusion1) (v2)		
Comment:			

Report Results

02/20/20

Sample Type: Clean — From Schedule Version 2

	Pos	Analysis Type	Sample ID	Start Time
◆	(clean)		Clean	2020/02/18 12:18

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	16.34	20.40	4.06	49.68	05:26
2	TC Clean	15.95	20.00	4.04	49.91	04:04
3	TC Clean	4.67	8.76	4.09	49.93	03:46
4	TC Clean	3.65	7.48	3.83	49.91	03:48

Sample Type: Clean — From Schedule Version 2

	Pos	Analysis Type	Sample ID	Start Time
◆	(clean)		Clean	2020/02/18 12:40

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	1.23	5.10	3.87	49.58	05:14
2	TC Clean	7.83	11.65	3.83	49.97	04:02
3	TC Clean	2.41	6.31	3.90	50.01	03:47
4	TC Clean	2.37	6.28	3.91	50.00	03:46

Sample Type: Clean From Schedule Version 2

	Pos	Analysis Type	Sample ID	Start Time
◆	(clean)		Clean	2020/02/18 13:02

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	1.15	5.07	3.92	49.57	05:12
2	TC Clean	5.41	9.49	4.08	50.05	04:05
3	TC Clean	2.29	6.24	3.95	50.04	03:48
4	TC Clean	2.33	6.39	4.06	49.94	03:53

Sample Type: Blank (Creating v1354) From Schedule Version 2

	Pos	Analysis Type	Sample ID	Start Time
◆	(blank)		Reagent/Acid Blank	2020/02/18 13:24

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	1.05	5.12	4.07	49.61	05:20
2	TC Clean	4.85	8.94	4.09	49.95	04:01
3	TC Clean	2.05	6.09	4.04	49.93	03:46
4	TC Clean	2.21	6.05	3.83	50.00	03:56
5	Reagent Blank	4.73	8.84	4.11	49.95	05:05
6	Acid Blank	1.14	4.95	3.81	49.59	05:29

Sample Type: Sample From Schedule Version 2

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	D	TOC	RB	0.1092 ppm	0.0000 ppm	0.0000%	2020/02/18 13:57

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.1092	1.0923	10.19	14.15	3.96	50.02	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.4954 (IC) (v1354)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 2

	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)	26.2416 ppm (PASS)	0.0000 ppm	0%	2020/02/18 14:12

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	26.2416	262.4158	176.12	180.05	3.93	50.04	10:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)	50 ppmC

Sample Type: Check Standard --> CCB From Schedule Version 2

	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%	2020/02/18 14:27

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	7.65	11.52	3.87	50.04	10:30

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)	0 ppmC

Sample Type: Sample From Schedule Version 2

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	1	TOC	MB1	0.0000 ppm	0.0000 ppm	0.0000%	2020/02/18 14:42

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.79	10.61	3.81	50.03	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.4954 (IC) (v1354)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

Sample Type: Check Standard --> LCS From Schedule Version 2

	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)	24.2651 ppm (PASS)	0.0000 ppm	0%	2020/02/18 14:56

Pos	Base Analysis	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time

	Type									
C	TOC	25.0 ppm	1	24.2651	242.6509	163.62	167.47	3.84	50.02	10:33

Completion State	Success Action	Method	Calibration	STD Conc - Pos C
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)	25 ppmC

Sample Type: Sample From Schedule Version 2

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	2	TOC	ICS	0.0000 ppm	0.0000 ppm	0.0000%	2020/02/18 15:11

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	8.86	12.71	3.85	50.02	10:33

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.4954 (IC) (v1354)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	3	TOC	K2000749-001.04	20.8183 ppm	0.4071 ppm	1.9600%	2020/02/18 15:26

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	21.1062	211.0616	142.95	146.82	3.88	50.03	10:29
2	TOC	20.5305	205.3047	139.31	143.21	3.91	50.00	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.4954 (IC) (v1354)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	4	TOC	K2000749-001.04 ms 4x	33.0987 ppm	0.0000 ppm	0.0000%	2020/02/18 15:54

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	33.0987	330.9874	218.77	222.58	3.81	50.02	10:34

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.4954 (IC) (v1354)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	5	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2020/02/18 16:08

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	8.01	11.78	3.77	50.03	10:35

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.4954 (IC) (v1354)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	6	TOC	K2001390-001.01	1.6210 ppm	0.0484 ppm	2.9900%	2020/02/18 16:23

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.6552	16.5521	19.96	23.70	3.73	49.99	10:29
2	TOC	1.5867	15.8673	19.53	23.19	3.66	49.99	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.4954 (IC) (v1354)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	7	TOC	K2001335-003.01	4.6815 ppm	0.0321 ppm	0.6900%	2020/02/18 16:51

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.7042	47.0417	39.24	43.05	3.81	50.00	10:28
2	TOC	4.6588	46.5878	38.95	42.86	3.90	50.01	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.4954 (IC) (v1354)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	8	TOC	K2001429-001.01	3.9784 ppm	0.1275 ppm	3.2000%	2020/02/18 17:19

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.8882	38.8823	34.08	37.94	3.86	50.02	10:28
2	TOC	4.0685	40.6853	35.22	39.23	4.01	50.04	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.4954 (IC) (v1354)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	9	TOC	K2001429-002.01	4.0378 ppm	0.0173 ppm	0.4300%	2020/02/18 17:47

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.0500	40.5003	35.10	38.93	3.83	50.07	10:31
2	TOC	4.0255	40.2551	34.95	38.84	3.89	50.07	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.4954 (IC) (v1354)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 2

	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)	26.1064 ppm	0.0000 ppm	0%	2020/02/18 18:15

						(PASS)				

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	26.1064	261.0635	175.27	179.23	3.96	50.12	10:29

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)	50 ppmC

Sample Type: Check Standard --> CCB From Schedule Version 2

	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%	2020/02/18 18:30

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	6.83	10.83	4.01	50.12	10:34

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)	0 ppmC

Sample Type: Sample From Schedule Version 2

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	10	TOC	K2001429-003.01	11.7268 ppm	0.0541 ppm	0.4600%	2020/02/18 18:44

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	11.6885	116.8854	83.40	87.36	3.96	50.13	10:27
2	TOC	11.7651	117.6509	83.88	87.93	4.05	50.13	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.4954 (IC) (v1354)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	11	TOC	K2001429-004.01	4.6596 ppm	0.1152 ppm	2.4700%	2020/02/18 19:13

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.7410	47.4102	39.47	43.42	3.95	50.12	10:26
2	TOC	4.5781	45.7812	38.44	42.61	4.17	50.12	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.4954 (IC) (v1354)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis	Sample ID	Result (ppmC)	Std. Dev.	RSD	Start Time

		Type			(ppmC)		
◆	12	TOC	K2001429-005.01	10.0111 ppm	0.0349 ppm	0.3500%	2020/02/18 19:41

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	9.9865	99.8645	72.64	76.61	3.97	50.15	10:29
2	TOC	10.0358	100.3580	72.95	77.03	4.08	50.15	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.4954 (IC) (v1354)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	13	TOC	K2001429-006.01	1.7894 ppm	0.0263 ppm	1.4700%	2020/02/18 20:09

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.8080	18.0799	20.93	25.01	4.09	50.17	10:31
2	TOC	1.7708	17.7083	20.69	24.53	3.83	50.19	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.4954 (IC) (v1354)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	14	TOC	K2001429-007.01	2.3952 ppm	0.0110 ppm	0.4600%	2020/02/18 20:37

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.4030	24.0298	24.69	28.54	3.86	50.17	10:27
2	TOC	2.3875	23.8748	24.59	28.52	3.93	50.19	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.4954 (IC) (v1354)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	15	TOC	K2001429-007.01 ms	30.2401 ppm	0.0000 ppm	0.0000%	2020/02/18 21:05

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	30.2401	302.4005	200.70	204.50	3.80	50.16	10:34

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.4954 (IC) (v1354)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	16	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2020/02/18 21:19

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.78	11.61	3.83	50.14	10:34

Dilution	Blank Contribution	Method	Calibration

1:10	(TC) 9.4954 (IC) (v1354)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 2

	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)	25.9885 ppm (PASS)	0.0000 ppm	0%	2020/02/18 21:34

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	25.9885	259.8852	174.52	178.33	3.81	50.13	10:27

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)	50 ppmC

Sample Type: Check Standard --> CCB From Schedule Version 2

	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%	2020/02/18 21:49

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	6.73	10.39	3.66	50.10	10:32

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)	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
v1353	2.1850	1.2280	0.0000	0.0000	0.0000	2020/02/13 14:11	Fusion1 (Fusion1)
v1354	1.5767	1.1400	0.0000	0.0000	0.0000	2020/02/18 13:57	Fusion1 (Fusion1)

Calibrations

Name: CAS_salt_010711 (TOC)

Version:	v31	Calibration curve formula:	TOC: y = 6.323x + 10.200
Ver Creation:	2020/01/07 14:30	r^2 value:	TOC: r^2 = 0.99991
Comment:			
Operator:	Fusion1 (Fusion1)		
Basic Analysis Type	TOC		

Basic Analysis Type: TOC

Sample ID	Y Raw Value	X Expected	Message	End Time
DI Water	9.5850	0.0000		2020/01/07 13:02
0.500 ppm	12.6160	0.5000		2020/01/07 13:17
1.0 ppm	15.6440	1.0000		2020/01/07 13:31
5.0 ppm	43.7700	5.0000		2020/01/07 13:45
10 ppm	73.2770	10.0000		2020/01/07 14:00
25 ppm	169.4210	25.0000		2020/01/07 14:14
50 ppm	325.6260	50.0000		2020/01/07 14:28

Methods

Name: CAS_salt_010711 (TOC)

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

Parameter	Value
SampleVolume	10.0 mL
Dilution	1:10
AcidVolume	0.5 ml
ReagentVolume	2.0 ml
UVReactorPrerinse	Off
UVReactorPrerinseVolume	5.0
NumberOfUVReactorPrerinses	1
ICSpargeTime	1.00 mins
DetectorSweepFlow	500 ml/min
PreSpargeTime	2.00 mins
SystemFlow	500 ml/min

Advanced Parameter	Value
NeedleRinseVolume	5.0 ml
VialPrimeVolume	2.0 ml
ICSamplePrimeVolume	2.0 ml
ICSpargeRinseVolume	12.0 ml
BaselineStabilizeTime	0.70 min
DetectorPressureFlow	150 ml/min
SyringeSpeedWaste	10
SyringeSpeedAcid	7
SyringeSpeedReagent	7
SyringeSpeedDIWater	7
NDIRPressurization	60 psig
SyringeSpeedSampleDispense	5
SyringeSpeedSampleAspirate	4
SyringeSpeedUVDispense	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	2020/02/18 22:04

ALS Environmental

StarLIMS Run: 670484

Analysis: DOC/TOC

Method: SM 5310 C, 9060A, 415.1, 9060

CCV: 11-GEN-05-82C 50 ppm LCS: 11-GEN-05-79J 25.0 ppm

ICAL Date: 1/7/2020

ICAL ID: 11-GEN-05-83-K->O/84-A/11-GEN-05-84-C->H

ICS ID: 11-GEN-05-78M

ICS TV: 25.0 ppm ICS % R < 1

Spike ID: 11-GEN-05-82C 0.05 ml of 5000 ppm stock ---> 10.0 ml = 25.0 ppm x dilution factor

Sodium Persulfate: 19-GEN-08-4-K

21 % H3PO4: 19-GEN-08-4-L

Equipment ID: K-TOC-03

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

FILTER ID: 16967789

Analyzed By: BCP	Date Analyzed: 2/19/20
Reviewed By: [signature]	Date Reviewed: 02/20/20

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
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February 20, 2020

Marcia Olive
Bhate Environmental Associates, Inc.
445 Union Blvd Ste 129
Lakewood, CO 80228

Work Order: **HS20020474**

Laboratory Results for: **Longhorn GW Treatment Plant Monthly Effluent Samples**

Dear Marcia,

ALS Environmental received 3 sample(s) on Feb 12, 2020 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: 20-Feb-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Monthly Effluent Samples
Work Order: HS20020474

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS20020474-01	LH18/24-SP650_021120	Water		11-Feb-2020 14:00	12-Feb-2020 09:05	☐
HS20020474-02	LH18/24-SP650_021120_BIX	Water		11-Feb-2020 14:00	12-Feb-2020 09:05	☐
HS20020474-03	Trip Blank	Water		11-Feb-2020 00:00	12-Feb-2020 09:05	☐

ALS Houston, US Date: 20-Feb-20

Client: Bhate Environmental Associates, Inc. **CASE NARRATIVE**
Project: Longhorn GW Treatment Plant Monthly Effluent Samples
Work Order: HS20020474

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: 150550

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

GCMS Volatiles by Method SW8260

Batch ID: R356213

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

Metals by Method SW6020

Batch ID: 150591

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

WetChemistry by Method SW7196

Batch ID: R356187

Sample ID: LH18/24-SP650_021120 (HS20020474-01MS)

- The recovery of the Matrix Spike (MS) associated to this analyte was outside of the established control limits. However, the LCS was within control limits. The recovery of the MS may be due to sample matrix interference.

ALS Houston, US Date: 20-Feb-20

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**
Project: Longhorn GW Treatment Plant Monthly Effluent Samples WorkOrder:HS20020474
Sample ID: LH18/24-SP650_021120 Lab ID:HS20020474-01
Collection Date: 11-Feb-2020 14:00 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	12-Feb-2020 13:50
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	12-Feb-2020 13:50
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	12-Feb-2020 13:50
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	12-Feb-2020 13:50
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	12-Feb-2020 13:50
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	12-Feb-2020 13:50
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	12-Feb-2020 13:50
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	12-Feb-2020 13:50
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	12-Feb-2020 13:50
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	12-Feb-2020 13:50
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	12-Feb-2020 13:50
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	12-Feb-2020 13:50
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	12-Feb-2020 13:50
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	12-Feb-2020 13:50
1,2-Dichloroethane	**1.3**		**0.20**	**0.50**	**1.0**	**UG/L**	1	12-Feb-2020 13:50
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	12-Feb-2020 13:50
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	12-Feb-2020 13:50
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	12-Feb-2020 13:50
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	12-Feb-2020 13:50
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	12-Feb-2020 13:50
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	12-Feb-2020 13:50
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	12-Feb-2020 13:50
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	12-Feb-2020 13:50
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	12-Feb-2020 13:50
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	12-Feb-2020 13:50
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	12-Feb-2020 13:50
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	12-Feb-2020 13:50
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	12-Feb-2020 13:50
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	12-Feb-2020 13:50
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	12-Feb-2020 13:50
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	12-Feb-2020 13:50
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	12-Feb-2020 13:50
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	12-Feb-2020 13:50
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	12-Feb-2020 13:50
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	12-Feb-2020 13:50
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	12-Feb-2020 13:50
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	12-Feb-2020 13:50
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	12-Feb-2020 13:50
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	12-Feb-2020 13:50

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

ALS Houston, US Date: 20-Feb-20

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**
Project: Longhorn GW Treatment Plant Monthly Effluent Samples WorkOrder:HS20020474
Sample ID: LH18/24-SP650_021120 Lab ID:HS20020474-01
Collection Date: 11-Feb-2020 14:00 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	12-Feb-2020 13:50
cis-1,2-Dichloroethene	**25**		**0.20**	**0.50**	**1.0**	**UG/L**	1	12-Feb-2020 13:50
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	12-Feb-2020 13:50
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	12-Feb-2020 13:50
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	12-Feb-2020 13:50
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	12-Feb-2020 13:50
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	12-Feb-2020 13:50
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	12-Feb-2020 13:50
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	12-Feb-2020 13:50
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	12-Feb-2020 13:50
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	12-Feb-2020 13:50
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	12-Feb-2020 13:50
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	12-Feb-2020 13:50
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	12-Feb-2020 13:50
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	12-Feb-2020 13:50
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	12-Feb-2020 13:50
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	12-Feb-2020 13:50
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	12-Feb-2020 13:50
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	12-Feb-2020 13:50
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	12-Feb-2020 13:50
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	12-Feb-2020 13:50
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	12-Feb-2020 13:50
Trichloroethene	**5.1**		**0.20**	**0.50**	**1.0**	**UG/L**	1	12-Feb-2020 13:50
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	12-Feb-2020 13:50
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	12-Feb-2020 13:50
Surr: 1,2-Dichloroethane-d4	*95.6*			**0**	*81-118*	*%REC*	*1*	*12-Feb-2020 13:50*
Surr: 4-Bromofluorobenzene	*100*			**0**	*85-114*	*%REC*	*1*	*12-Feb-2020 13:50*
Surr: Dibromofluoromethane	*94.8*			**0**	*80-119*	*%REC*	*1*	*12-Feb-2020 13:50*
Surr: Toluene-d8	*108*			**0**	*89-112*	*%REC*	*1*	*12-Feb-2020 13:50*
SEMIVOLATILES SIM		**Method:SW8270SIM**				Prep:SW3510 / 12-Feb-2020		Analyst: LG
1,4-Dioxane	**24**	a	**1.0**	**1.0**	**1.0**	**ug/L**	100	13-Feb-2020 11:52
Surr: 2-Fluorobiphenyl	*125*			**0**	*40-140*	*%REC*	*100*	*13-Feb-2020 11:52*
Surr: 4-Terphenyl-d14	*131*			**0**	*40-140*	*%REC*	*100*	*13-Feb-2020 11:52*
Surr: Nitrobenzene-d5	*110*			**0**	*40-140*	*%REC*	*100*	*13-Feb-2020 11:52*
METALS BY ICPMS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 13-Feb-2020		Analyst: JHD
Barium	**0.304**		**0.00190**	**0.00250**	**0.00500**	**mg/L**	1	19-Feb-2020 13:42
Lead	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	19-Feb-2020 13:42
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	19-Feb-2020 13:42
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	19-Feb-2020 13:42

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

ALS Houston, US Date: 20-Feb-20

Client: Bhate Environmental Associates, Inc.
ANALYTICAL REPORT
Project: Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder:HS20020474
Sample ID: LH18/24-SP650_021120
Lab ID:HS20020474-01
Collection Date: 11-Feb-2020 14:00
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
HEXAVALENT CHROMIUM BY SW7196A	**Method:SW7196**							Analyst: MZD
Chromium, Hexavalent	0.0100	U	0.00600	0.0100	0.0100	mg/L	1	12-Feb-2020 12:09

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

ALS Houston, US Date: 20-Feb-20

Client: Bhate Environmental Associates, Inc.
ANALYTICAL REPORT
Project: Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder:HS20020474
Sample ID: LH18/24-SP650_021120_BIX
Lab ID:HS20020474-02
Collection Date: 11-Feb-2020 14:00
Matrix:Water

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	19-Feb-2020 09:28

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

ALS Houston, US Date: 20-Feb-20

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**
Project: Longhorn GW Treatment Plant Monthly Effluent Samples WorkOrder:HS20020474
Sample ID: Trip Blank Lab ID:HS20020474-03
Collection Date: 11-Feb-2020 00:00 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	12-Feb-2020 13:26
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	12-Feb-2020 13:26
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	12-Feb-2020 13:26
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	12-Feb-2020 13:26
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	12-Feb-2020 13:26
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	12-Feb-2020 13:26
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	12-Feb-2020 13:26
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	12-Feb-2020 13:26
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	12-Feb-2020 13:26
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	12-Feb-2020 13:26
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	12-Feb-2020 13:26
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	12-Feb-2020 13:26
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	12-Feb-2020 13:26
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	12-Feb-2020 13:26
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	12-Feb-2020 13:26
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	12-Feb-2020 13:26
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	12-Feb-2020 13:26
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	12-Feb-2020 13:26
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	12-Feb-2020 13:26
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	12-Feb-2020 13:26
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	12-Feb-2020 13:26
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	12-Feb-2020 13:26
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	12-Feb-2020 13:26
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	12-Feb-2020 13:26
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	12-Feb-2020 13:26
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	12-Feb-2020 13:26
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	12-Feb-2020 13:26
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	12-Feb-2020 13:26
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	12-Feb-2020 13:26
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	12-Feb-2020 13:26
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	12-Feb-2020 13:26
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	12-Feb-2020 13:26
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	12-Feb-2020 13:26
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	12-Feb-2020 13:26
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	12-Feb-2020 13:26
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	12-Feb-2020 13:26
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	12-Feb-2020 13:26
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	12-Feb-2020 13:26
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	12-Feb-2020 13:26

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

ALS Houston, US Date: 20-Feb-20

Client: Bhate Environmental Associates, Inc.
ANALYTICAL REPORT
Project: Longhorn GW Treatment Plant Monthly Effluent Samples WorkOrder:HS20020474
Sample ID: Trip Blank Lab ID:HS20020474-03
Collection Date: 11-Feb-2020 00:00 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	12-Feb-2020 13:26
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	12-Feb-2020 13:26
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	12-Feb-2020 13:26
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	12-Feb-2020 13:26
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	12-Feb-2020 13:26
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	12-Feb-2020 13:26
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	12-Feb-2020 13:26
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	12-Feb-2020 13:26
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	12-Feb-2020 13:26
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	12-Feb-2020 13:26
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	12-Feb-2020 13:26
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	12-Feb-2020 13:26
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	12-Feb-2020 13:26
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	12-Feb-2020 13:26
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	12-Feb-2020 13:26
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	12-Feb-2020 13:26
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	12-Feb-2020 13:26
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	12-Feb-2020 13:26
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	12-Feb-2020 13:26
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	12-Feb-2020 13:26
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	12-Feb-2020 13:26
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	12-Feb-2020 13:26
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	12-Feb-2020 13:26
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	12-Feb-2020 13:26
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	12-Feb-2020 13:26
Surr: 1,2-Dichloroethane-d4	*96.6*			**0**	*81-118*	*%REC*	*1*	*12-Feb-2020 13:26*
Surr: 4-Bromofluorobenzene	*101*			**0**	*85-114*	*%REC*	*1*	*12-Feb-2020 13:26*
Surr: Dibromofluoromethane	*93.9*			**0**	*80-119*	*%REC*	*1*	*12-Feb-2020 13:26*
Surr: Toluene-d8	*108*			**0**	*89-112*	*%REC*	*1*	*12-Feb-2020 13:26*

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

ALS Houston, US

Date: 20-Feb-20

Weight / Prep Log

Client: Bhate Environmental Associates, Inc.

Project: Longhorn GW Treatment Plant Monthly Effluent Samples

WorkOrder: HS20020474

Batch ID: 150550 **Start Date:** 12 Feb 2020 08:11 **End Date:** 12 Feb 2020 14:00

Method: SV AQ SEP FUN EXTRACT-LOWLEV - 3510C **Prep Code:** 3510_B_SIM

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS20020474-01	1	1000 (mL)	1 (mL)	0.001

Batch ID: 150591 **Start Date:** 13 Feb 2020 09:09 **End Date:** 13 Feb 2020 13:00

Method: WATER - SW3010A **Prep Code:** 3010A

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS20020474-01		10 (mL)	10 (mL)	1

ALS Houston, US Date: 20-Feb-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder: HS20020474

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: 150550 (1)	**Test Name :** SEMIVOLATILES SIM				**Matrix:** Water	
HS20020474-01	LH18/24-SP650_021120	11 Feb 2020 14:00		12 Feb 2020 08:11	13 Feb 2020 11:52	100
Batch ID: 150591 (0)	**Test Name :** METALS BY ICPMS BY SW6020A				**Matrix:** Water	
HS20020474-01	LH18/24-SP650_021120	11 Feb 2020 14:00		13 Feb 2020 13:00	19 Feb 2020 13:42	1
Batch ID: R356187 (0)	**Test Name :** HEXAVALENT CHROMIUM BY SW7196A				**Matrix:** Water	
HS20020474-01	LH18/24-SP650_021120	11 Feb 2020 14:00			12 Feb 2020 12:09	1
Batch ID: R356213 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Water	
HS20020474-01	LH18/24-SP650_021120	11 Feb 2020 14:00			12 Feb 2020 13:50	1
HS20020474-03	Trip Blank	11 Feb 2020 00:00			12 Feb 2020 13:26	1
Batch ID: R356523 (0)	**Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)				**Matrix:** Water	
HS20020474-02	LH18/24-SP650_021120_BIX	11 Feb 2020 14:00			19 Feb 2020 09:28	1

ALS Houston, US Date: 20-Feb-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder: HS20020474

QC BATCH REPORT

Batch ID: 150591 (0) **Instrument: ICPMS05** **Method: METALS BY ICPMS BY SW6020A**

MBLK Sample ID: **MBLK-150591** Units: **mg/L** Analysis Date: **19-Feb-2020 13:35**
Client ID: Run ID: **ICPMS05_356564** SeqNo: **5479002** PrepDate: **13-Feb-2020** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Barium	0.00250	0.00500								U
Lead	0.00100	0.00500								U
Selenium	0.00250	0.00500								U
Silver	0.000500	0.00500								U

LCS Sample ID: **LCS-150591** Units: **mg/L** Analysis Date: **19-Feb-2020 13:38**
Client ID: Run ID: **ICPMS05_356564** SeqNo: **5479003** PrepDate: **13-Feb-2020** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Barium	0.0465	0.00500	0.05	0	93.0	86 - 114				
Selenium	0.04785	0.00500	0.05	0	95.7	80 - 120				
Silver	0.04722	0.00500	0.05	0	94.4	85 - 116				

LCS Sample ID: **LCS-150591** Units: **mg/L** Analysis Date: **19-Feb-2020 15:48**
Client ID: Run ID: **ICPMS05_356564** SeqNo: **5479241** PrepDate: **13-Feb-2020** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Lead	0.04426	0.00500	0.05	0	88.5	88 - 115				

MS Sample ID: **HS20020474-01MS** Units: **mg/L** Analysis Date: **19-Feb-2020 13:47**
Client ID: **LH18/24-SP650_021120** Run ID: **ICPMS05_356564** SeqNo: **5479007** PrepDate: **13-Feb-2020** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Barium	0.3571	0.00500	0.05	0.3037	107	86 - 114				O
Lead	0.0478	0.00500	0.05	0.000523	94.6	88 - 115				
Selenium	0.04852	0.00500	0.05	0.000303	96.4	80 - 120				
Silver	0.04626	0.00500	0.05	0.000017	92.5	85 - 116				

ALS Houston, US Date: 20-Feb-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder: HS20020474

QC BATCH REPORT

Batch ID: 150591 (0) **Instrument: ICPMS05** **Method: METALS BY ICPMS BY SW6020A**

MSD Sample ID: **HS20020474-01MSD** Units: **mg/L** Analysis Date: **19-Feb-2020 13:49**
Client ID: **LH18/24-SP650_021120** Run ID: **ICPMS05_356564** SeqNo: **5479008** PrepDate: **13-Feb-2020** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Barium	0.3484	0.00500	0.05	0.3037	89.5	86 - 114	0.3571	2.48	20	O
Lead	0.04598	0.00500	0.05	0.000523	90.9	88 - 115	0.0478	3.89	20	
Selenium	0.04608	0.00500	0.05	0.000303	91.6	80 - 120	0.04852	5.15	20	
Silver	0.04399	0.00500	0.05	0.000017	87.9	85 - 116	0.04626	5.03	20	

PDS Sample ID: **HS20020474-01PDS** Units: **mg/L** Analysis Date: **19-Feb-2020 13:51**
Client ID: **LH18/24-SP650_021120** Run ID: **ICPMS05_356564** SeqNo: **5479009** PrepDate: **13-Feb-2020** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Barium	0.4093	0.00500	0.1	0.3037	106	80 - 120				
Lead	0.1026	0.00500	0.1	0.000523	102	80 - 120				
Selenium	0.1107	0.00500	0.1	0.000303	110	80 - 120				

SD Sample ID: **HS20020474-01SD** Units: **mg/L** Analysis Date: **19-Feb-2020 13:44**
Client ID: **LH18/24-SP650_021120** Run ID: **ICPMS05_356564** SeqNo: **5479006** PrepDate: **13-Feb-2020** DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Barium	0.2944	0.0250					0.3037	3.06	10	
Lead	0.00500	0.0250					0.000523	0	10	U
Selenium	0.0125	0.0250					0.000303	0	10	U
Silver	0.00250	0.0250					0.000017	0	10	U

The following samples were analyzed in this batch: HS20020474-01

ALS Houston, US Date: 20-Feb-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder: HS20020474

QC BATCH REPORT

Batch ID: 150550 (1) **Instrument: SV-6** **Method: SEMIVOLATILES SIM**

MBLK Sample ID: **MBLK-150550** Units: **ug/L** Analysis Date: **13-Feb-2020 09:12**
Client ID: Run ID: **SV-6_356229** SeqNo: **5471895** PrepDate: **12-Feb-2020** 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	*0.06631*	*0*	*0.08*	*0*	*82.9*	*40 - 140*				
Surr: 4-Terphenyl-d14	*0.06481*	*0*	*0.08*	*0*	*81.0*	*40 - 140*				
Surr: Nitrobenzene-d5	*0.06979*	*0*	*0.08*	*0*	*87.2*	*40 - 140*				

LCS Sample ID: **LCS-150550** Units: **ug/L** Analysis Date: **13-Feb-2020 10:09**
Client ID: Run ID: **SV-6_356229** SeqNo: **5471897** PrepDate: **12-Feb-2020** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,4-Dioxane	0.08428	0.010	0.08	0	105	40 - 140				
Surr: 2-Fluorobiphenyl	*0.08746*	*0*	*0.08*	*0*	*109*	*40 - 140*				
Surr: 4-Terphenyl-d14	*0.06204*	*0*	*0.08*	*0*	*77.5*	*40 - 140*				
Surr: Nitrobenzene-d5	*0.0729*	*0*	*0.08*	*0*	*91.1*	*40 - 140*				

LCSD Sample ID: **LCSD-150550** Units: **ug/L** Analysis Date: **13-Feb-2020 09:50**
Client ID: Run ID: **SV-6_356229** SeqNo: **5471896** PrepDate: **12-Feb-2020** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,4-Dioxane	0.0748	0.010	0.08	0	93.5	40 - 140	0.08428	11.9	20	
Surr: 2-Fluorobiphenyl	*0.08016*	*0*	*0.08*	*0*	*100*	*40 - 140*	*0.08746*	*8.7*	*20*	
Surr: 4-Terphenyl-d14	*0.06355*	*0*	*0.08*	*0*	*79.4*	*40 - 140*	*0.06204*	*2.42*	*20*	
Surr: Nitrobenzene-d5	*0.06914*	*0*	*0.08*	*0*	*86.4*	*40 - 140*	*0.0729*	*5.29*	*20*	

The following samples were analyzed in this batch: HS20020474-01

ALS Houston, US Date: 20-Feb-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder: HS20020474

QC BATCH REPORT

Batch ID: R356213 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-200212** Units: **UG/L** Analysis Date: **12-Feb-2020 13:02**
Client ID: Run ID: **VOA6_356213** SeqNo: **5471631** 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: 20-Feb-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder: HS20020474

QC BATCH REPORT

Batch ID: R356213 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-200212** Units: **UG/L** Analysis Date: **12-Feb-2020 13:02**
Client ID: Run ID: **VOA6_356213** SeqNo: **5471631** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	1.0	2.0								U
Carbon tetrachloride	0.50	1.0								U
Chlorobenzene	0.50	1.0								U
Chloroethane	0.50	1.0								U
Chloroform	0.50	1.0								U
Chloromethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
cis-1,3-Dichloropropene	0.50	1.0								U
Dibromochloromethane	0.50	1.0								U
Dibromomethane	0.50	1.0								U
Dichlorodifluoromethane	0.50	1.0								U
Ethylbenzene	0.50	1.0								U
Hexachlorobutadiene	1.0	1.0								U
Isopropylbenzene	0.50	1.0								U
m,p-Xylene	1.0	2.0								U
Methylene chloride	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	*47.77*	*1.0*	*50*	*0*	*95.5*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*49.55*	*1.0*	*50*	*0*	*99.1*	*85 - 114*				
Surr: Dibromofluoromethane	*46.81*	*1.0*	*50*	*0*	*93.6*	*80 - 119*				
Surr: Toluene-d8	*54.71*	*1.0*	*50*	*0*	*109*	*89 - 112*				

ALS Houston, US Date: 20-Feb-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder: HS20020474

QC BATCH REPORT

Batch ID: R356213 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

LCS Sample ID: **VLCSW-200212** Units: **UG/L** Analysis Date: **12-Feb-2020 12:14**
Client ID: Run ID: **VOA6_356213** SeqNo: **5471630** 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	21.25	1.0	20	0	106	78 - 124				
1,1,1-Trichloroethane	19.25	1.0	20	0	96.2	74 - 131				
1,1,2,2-Tetrachloroethane	20.29	1.0	20	0	101	71 - 121				
1,1,2-Trichloroethane	20.55	1.0	20	0	103	80 - 119				
1,1-Dichloroethane	18.92	1.0	20	0	94.6	77 - 125				
1,1-Dichloroethene	18.1	1.0	20	0	90.5	71 - 131				
1,1-Dichloropropene	17.85	1.0	20	0	89.3	78 - 125				
1,2,3-Trichlorobenzene	24.29	1.0	20	0	121	69 - 129				
1,2,3-Trichloropropane	20.29	1.0	20	0	101	73 - 122				
1,2,4-Trichlorobenzene	21.44	1.0	20	0	107	69 - 130				
1,2,4-Trimethylbenzene	20.13	1.0	20	0	101	76 - 124				
1,2-Dibromo-3-chloropropane	21.68	1.0	20	0	108	62 - 128				
1,2-Dibromoethane	21.36	1.0	20	0	107	77 - 121				
1,2-Dichlorobenzene	20.35	1.0	20	0	102	80 - 119				
1,2-Dichloroethane	22.09	1.0	20	0	110	73 - 128				
1,2-Dichloropropane	19.38	1.0	20	0	96.9	78 - 122				
1,3,5-Trimethylbenzene	19.81	1.0	20	0	99.0	75 - 124				
1,3-Dichlorobenzene	20.38	1.0	20	0	102	80 - 119				
1,3-Dichloropropane	20.06	1.0	20	0	100	80 - 119				
1,4-Dichlorobenzene	19.96	1.0	20	0	99.8	79 - 118				
2,2-Dichloropropane	19.33	1.0	20	0	96.6	60 - 139				
2-Butanone	39.29	2.0	40	0	98.2	56 - 143				
2-Chlorotoluene	19.6	1.0	20	0	98.0	79 - 122				
2-Hexanone	40.94	2.0	40	0	102	57 - 139				
4-Chlorotoluene	19.7	1.0	20	0	98.5	78 - 122				
4-Isopropyltoluene	17.76	1.0	20	0	88.8	77 - 127				
4-Methyl-2-pentanone	41.49	2.0	40	0	104	67 - 130				
Acetone	43.59	2.0	40	0	109	39 - 160				
Benzene	19.54	1.0	20	0	97.7	79 - 120				
Bromobenzene	20.33	1.0	20	0	102	80 - 120				
Bromochloromethane	19.46	1.0	20	0	97.3	78 - 123				
Bromodichloromethane	21.17	1.0	20	0	106	79 - 125				
Bromoform	22.79	1.0	20	0	114	66 - 130				
Bromomethane	21.38	1.0	20	0	107	53 - 141				

ALS Houston, US Date: 20-Feb-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder: HS20020474

QC BATCH REPORT

Batch ID: R356213 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

LCS Sample ID: **VLCSW-200212** Units: **UG/L** Analysis Date: **12-Feb-2020 12:14**
Client ID: Run ID: **VOA6_356213** SeqNo: **5471630** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	35.05	2.0	40	0	87.6	64 - 133				
Carbon tetrachloride	18.08	1.0	20	0	90.4	72 - 136				
Chlorobenzene	20.06	1.0	20	0	100	82 - 118				
Chloroethane	19.31	1.0	20	0	96.5	60 - 138				
Chloroform	18.62	1.0	20	0	93.1	79 - 124				
Chloromethane	17.44	1.0	20	0	87.2	50 - 139				
cis-1,2-Dichloroethene	18.75	1.0	20	0	93.8	78 - 123				
cis-1,3-Dichloropropene	20.31	1.0	20	0	102	75 - 124				
Dibromochloromethane	21.18	1.0	20	0	106	74 - 126				
Dibromomethane	21.26	1.0	20	0	106	79 - 123				
Dichlorodifluoromethane	16.39	1.0	20	0	82.0	32 - 152				
Ethylbenzene	19.55	1.0	20	0	97.8	79 - 121				
Hexachlorobutadiene	20.82	1.0	20	0	104	66 - 134				
Isopropylbenzene	19.58	1.0	20	0	97.9	72 - 131				
m,p-Xylene	39.36	2.0	40	0	98.4	80 - 121				
Methylene chloride	18.65	2.0	20	0	93.3	74 - 124				
Naphthalene	22.41	1.0	20	0	112	61 - 128				
n-Butylbenzene	17.36	1.0	20	0	86.8	75 - 128				
n-Propylbenzene	18.8	1.0	20	0	94.0	76 - 126				
o-Xylene	20.34	1.0	20	0	102	78 - 122				
sec-Butylbenzene	17.85	1.0	20	0	89.2	77 - 126				
Styrene	20.93	1.0	20	0	105	78 - 123				
tert-Butylbenzene	18.85	1.0	20	0	94.3	78 - 124				
Tetrachloroethene	19.75	1.0	20	0	98.8	74 - 129				
Toluene	19.73	1.0	20	0	98.7	80 - 121				
trans-1,2-Dichloroethene	18.22	1.0	20	0	91.1	75 - 124				
trans-1,3-Dichloropropene	20.92	1.0	20	0	105	73 - 127				
Trichloroethene	19.14	1.0	20	0	95.7	79 - 123				
Trichlorofluoromethane	18.56	1.0	20	0	92.8	65 - 141				
Vinyl chloride	16.88	1.0	20	0	84.4	58 - 137				
Surr: 1,2-Dichloroethane-d4	*53.28*	*1.0*	*50*	*0*	*107*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*51.78*	*1.0*	*50*	*0*	*104*	*85 - 114*				
Surr: Dibromofluoromethane	*50.33*	*1.0*	*50*	*0*	*101*	*80 - 119*				
Surr: Toluene-d8	*51.82*	*1.0*	*50*	*0*	*104*	*89 - 112*				

ALS Houston, US Date: 20-Feb-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder: HS20020474

QC BATCH REPORT

Batch ID: R356213 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS20020474-01MS** Units: **UG/L** Analysis Date: **12-Feb-2020 14:14**
Client ID: **LH18/24-SP650_021120** Run ID: **VOA6_356213** SeqNo: **5471634** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	20.63	1.0	20	0	103	78 - 124				
1,1,1-Trichloroethane	19.58	1.0	20	0	97.9	74 - 131				
1,1,2,2-Tetrachloroethane	19.23	1.0	20	0	96.2	71 - 121				
1,1,2-Trichloroethane	19.14	1.0	20	0	95.7	80 - 119				
1,1-Dichloroethane	17.63	1.0	20	0	88.1	77 - 125				
1,1-Dichloroethene	18.81	1.0	20	0	94.0	71 - 131				
1,1-Dichloropropene	19.52	1.0	20	0	97.6	78 - 125				
1,2,3-Trichlorobenzene	20.41	1.0	20	0	102	69 - 129				
1,2,3-Trichloropropane	18.86	1.0	20	0	94.3	73 - 122				
1,2,4-Trichlorobenzene	19.17	1.0	20	0	95.9	69 - 130				
1,2,4-Trimethylbenzene	21.44	1.0	20	0	107	76 - 124				
1,2-Dibromo-3-chloropropane	19.73	1.0	20	0	98.7	62 - 128				
1,2-Dibromoethane	19.36	1.0	20	0	96.8	77 - 121				
1,2-Dichlorobenzene	19.95	1.0	20	0	99.7	80 - 119				
1,2-Dichloroethane	20.67	1.0	20	1.31	96.8	73 - 128				
1,2-Dichloropropane	17.65	1.0	20	0	88.2	78 - 122				
1,3,5-Trimethylbenzene	22.2	1.0	20	0	111	75 - 124				
1,3-Dichlorobenzene	21.04	1.0	20	0	105	80 - 119				
1,3-Dichloropropane	18.75	1.0	20	0	93.7	80 - 119				
1,4-Dichlorobenzene	20.17	1.0	20	0	101	79 - 118				
2,2-Dichloropropane	18.56	1.0	20	0	92.8	60 - 139				
2-Butanone	31.16	2.0	40	0	77.9	56 - 143				
2-Chlorotoluene	21.11	1.0	20	0	106	79 - 122				
2-Hexanone	37.47	2.0	40	0	93.7	57 - 139				
4-Chlorotoluene	20.95	1.0	20	0	105	78 - 122				
4-Isopropyltoluene	20.94	1.0	20	0	105	77 - 127				
4-Methyl-2-pentanone	37.33	2.0	40	0	93.3	67 - 130				
Acetone	31.54	2.0	40	0	78.9	39 - 160				
Benzene	18.53	1.0	20	0	92.7	79 - 120				
Bromobenzene	20.86	1.0	20	0	104	80 - 120				
Bromochloromethane	17.11	1.0	20	0	85.5	78 - 123				
Bromodichloromethane	19.38	1.0	20	0	96.9	79 - 125				
Bromoform	20.84	1.0	20	0	104	66 - 130				
Bromomethane	18.27	1.0	20	0	91.4	53 - 141				

ALS Houston, US Date: 20-Feb-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder: HS20020474

QC BATCH REPORT

Batch ID: R356213 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS20020474-01MS** Units: **UG/L** Analysis Date: **12-Feb-2020 14:14**
Client ID: **LH18/24-SP650_021120** Run ID: **VOA6_356213** SeqNo: **5471634** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	36.2	2.0	40	0	90.5	64 - 133				
Carbon tetrachloride	20.19	1.0	20	0	101	72 - 136				
Chlorobenzene	19.93	1.0	20	0	99.7	82 - 118				
Chloroethane	16.41	1.0	20	0	82.0	60 - 138				
Chloroform	16.69	1.0	20	0	83.5	79 - 124				
Chloromethane	17.2	1.0	20	0	86.0	50 - 139				
cis-1,2-Dichloroethene	42.82	1.0	20	25.33	87.5	78 - 123				
cis-1,3-Dichloropropene	17.92	1.0	20	0	89.6	75 - 124				
Dibromochloromethane	19.93	1.0	20	0	99.6	74 - 126				
Dibromomethane	18.18	1.0	20	0	90.9	79 - 123				
Dichlorodifluoromethane	18.46	1.0	20	0	92.3	32 - 152				
Ethylbenzene	20.89	1.0	20	0	104	79 - 121				
Hexachlorobutadiene	23.34	1.0	20	0	117	66 - 134				
Isopropylbenzene	21.46	1.0	20	0	107	72 - 131				
m,p-Xylene	41.52	2.0	40	0	104	80 - 121				
Methylene chloride	17.81	2.0	20	0	89.1	74 - 124				
Naphthalene	17.86	1.0	20	0	89.3	61 - 128				
n-Butylbenzene	21.07	1.0	20	0	105	75 - 128				
n-Propylbenzene	21.79	1.0	20	0	109	76 - 126				
o-Xylene	20.58	1.0	20	0	103	78 - 122				
sec-Butylbenzene	22.37	1.0	20	0	112	77 - 126				
Styrene	19.89	1.0	20	0	99.5	78 - 123				
tert-Butylbenzene	22.51	1.0	20	0	113	78 - 124				
Tetrachloroethene	22.7	1.0	20	0	113	74 - 129				
Toluene	20.39	1.0	20	0	102	80 - 121				
trans-1,2-Dichloroethene	17.52	1.0	20	0	87.6	75 - 124				
trans-1,3-Dichloropropene	18.5	1.0	20	0	92.5	73 - 127				
Trichloroethene	24.83	1.0	20	5.061	98.8	79 - 123				
Trichlorofluoromethane	21.6	1.0	20	0	108	65 - 141				
Vinyl chloride	18.28	1.0	20	0	91.4	58 - 137				
Surr: 1,2-Dichloroethane-d4	*47.58*	*1.0*	*50*	*0*	*95.2*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*50.79*	*1.0*	*50*	*0*	*102*	*85 - 114*				
Surr: Dibromofluoromethane	*47.65*	*1.0*	*50*	*0*	*95.3*	*80 - 119*				
Surr: Toluene-d8	*54.21*	*1.0*	*50*	*0*	*108*	*89 - 112*				

ALS Houston, US Date: 20-Feb-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder: HS20020474

QC BATCH REPORT

Batch ID: R356213 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MSD Sample ID: **HS20020474-01MSD** Units: **UG/L** Analysis Date: **12-Feb-2020 14:38**
Client ID: **LH18/24-SP650_021120** Run ID: **VOA6_356213** SeqNo: **5471635** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	20.55	1.0	20	0	103	78 - 124	20.63	0.396	20	
1,1,1-Trichloroethane	18.68	1.0	20	0	93.4	74 - 131	19.58	4.68	20	
1,1,2,2-Tetrachloroethane	20.29	1.0	20	0	101	71 - 121	19.23	5.33	20	
1,1,2-Trichloroethane	19.03	1.0	20	0	95.1	80 - 119	19.14	0.581	20	
1,1-Dichloroethane	16.89	1.0	20	0	84.4	77 - 125	17.63	4.28	20	
1,1-Dichloroethene	17.54	1.0	20	0	87.7	71 - 131	18.81	7.01	20	
1,1-Dichloropropene	18.86	1.0	20	0	94.3	78 - 125	19.52	3.45	20	
1,2,3-Trichlorobenzene	24.77	1.0	20	0	124	69 - 129	20.41	19.3	20	
1,2,3-Trichloropropane	20.19	1.0	20	0	101	73 - 122	18.86	6.77	20	
1,2,4-Trichlorobenzene	21.73	1.0	20	0	109	69 - 130	19.17	12.5	20	
1,2,4-Trimethylbenzene	21.6	1.0	20	0	108	76 - 124	21.44	0.761	20	
1,2-Dibromo-3-chloropropane	19.36	1.0	20	0	96.8	62 - 128	19.73	1.89	20	
1,2-Dibromoethane	19.99	1.0	20	0	100.0	77 - 121	19.36	3.19	20	
1,2-Dichlorobenzene	20.55	1.0	20	0	103	80 - 119	19.95	3	20	
1,2-Dichloroethane	20.56	1.0	20	1.31	96.2	73 - 128	20.67	0.555	20	
1,2-Dichloropropane	17.83	1.0	20	0	89.2	78 - 122	17.65	1.05	20	
1,3,5-Trimethylbenzene	22.18	1.0	20	0	111	75 - 124	22.2	0.0965	20	
1,3-Dichlorobenzene	21.1	1.0	20	0	105	80 - 119	21.04	0.281	20	
1,3-Dichloropropane	18.92	1.0	20	0	94.6	80 - 119	18.75	0.928	20	
1,4-Dichlorobenzene	20.72	1.0	20	0	104	79 - 118	20.17	2.66	20	
2,2-Dichloropropane	18.28	1.0	20	0	91.4	60 - 139	18.56	1.57	20	
2-Butanone	33.33	2.0	40	0	83.3	56 - 143	31.16	6.72	20	
2-Chlorotoluene	20.97	1.0	20	0	105	79 - 122	21.11	0.664	20	
2-Hexanone	38.73	2.0	40	0	96.8	57 - 139	37.47	3.3	20	
4-Chlorotoluene	21.03	1.0	20	0	105	78 - 122	20.95	0.368	20	
4-Isopropyltoluene	21.49	1.0	20	0	107	77 - 127	20.94	2.61	20	
4-Methyl-2-pentanone	40.41	2.0	40	0	101	67 - 130	37.33	7.93	20	
Acetone	32.55	2.0	40	0	81.4	39 - 160	31.54	3.16	20	
Benzene	18.12	1.0	20	0	90.6	79 - 120	18.53	2.26	20	
Bromobenzene	20.75	1.0	20	0	104	80 - 120	20.86	0.548	20	
Bromochloromethane	16.77	1.0	20	0	83.9	78 - 123	17.11	1.98	20	
Bromodichloromethane	19.25	1.0	20	0	96.3	79 - 125	19.38	0.688	20	
Bromoform	21.3	1.0	20	0	107	66 - 130	20.84	2.21	20	
Bromomethane	18.01	1.0	20	0	90.1	53 - 141	18.27	1.44	20	

ALS Houston, US Date: 20-Feb-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder: HS20020474

QC BATCH REPORT

Batch ID: R356213 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MSD Sample ID: **HS20020474-01MSD** Units: **UG/L** Analysis Date: **12-Feb-2020 14:38**
Client ID: **LH18/24-SP650_021120** Run ID: **VOA6_356213** SeqNo: **5471635** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Carbon disulfide	33.82	2.0	40	0	84.6	64 - 133	36.2	6.78	20	
Carbon tetrachloride	20.18	1.0	20	0	101	72 - 136	20.19	0.0446	20	
Chlorobenzene	19.62	1.0	20	0	98.1	82 - 118	19.93	1.56	20	
Chloroethane	16.51	1.0	20	0	82.5	60 - 138	16.41	0.621	20	
Chloroform	16.16	1.0	20	0	80.8	79 - 124	16.69	3.21	20	
Chloromethane	16.18	1.0	20	0	80.9	50 - 139	17.2	6.11	20	
cis-1,2-Dichloroethene	41.74	1.0	20	25.33	82.1	78 - 123	42.82	2.56	20	
cis-1,3-Dichloropropene	18.16	1.0	20	0	90.8	75 - 124	17.92	1.36	20	
Dibromochloromethane	20.06	1.0	20	0	100	74 - 126	19.93	0.639	20	
Dibromomethane	18.8	1.0	20	0	94.0	79 - 123	18.18	3.35	20	
Dichlorodifluoromethane	17.18	1.0	20	0	85.9	32 - 152	18.46	7.15	20	
Ethylbenzene	20.35	1.0	20	0	102	79 - 121	20.89	2.64	20	
Hexachlorobutadiene	25.29	1.0	20	0	126	66 - 134	23.34	8.02	20	
Isopropylbenzene	21.32	1.0	20	0	107	72 - 131	21.46	0.663	20	
m,p-Xylene	40.46	2.0	40	0	101	80 - 121	41.52	2.58	20	
Methylene chloride	17.14	2.0	20	0	85.7	74 - 124	17.81	3.86	20	
Naphthalene	21.29	1.0	20	0	106	61 - 128	17.86	17.6	20	
n-Butylbenzene	21.75	1.0	20	0	109	75 - 128	21.07	3.17	20	
n-Propylbenzene	21.82	1.0	20	0	109	76 - 126	21.79	0.138	20	
o-Xylene	20.25	1.0	20	0	101	78 - 122	20.58	1.62	20	
sec-Butylbenzene	22.82	1.0	20	0	114	77 - 126	22.37	1.97	20	
Styrene	20.15	1.0	20	0	101	78 - 123	19.89	1.28	20	
tert-Butylbenzene	22.59	1.0	20	0	113	78 - 124	22.51	0.339	20	
Tetrachloroethene	21.82	1.0	20	0	109	74 - 129	22.7	3.92	20	
Toluene	20.02	1.0	20	0	100	80 - 121	20.39	1.83	20	
trans-1,2-Dichloroethene	16.76	1.0	20	0	83.8	75 - 124	17.52	4.39	20	
trans-1,3-Dichloropropene	18.72	1.0	20	0	93.6	73 - 127	18.5	1.19	20	
Trichloroethene	24.26	1.0	20	5.061	96.0	79 - 123	24.83	2.31	20	
Trichlorofluoromethane	19.78	1.0	20	0	98.9	65 - 141	21.6	8.78	20	
Vinyl chloride	16.94	1.0	20	0	84.7	58 - 137	18.28	7.6	20	
Surr: 1,2-Dichloroethane-d4	*47.39*	*1.0*	*50*	*0*	*94.8*	*81 - 118*	*47.58*	*0.4*	*20*	
Surr: 4-Bromofluorobenzene	*51*	*1.0*	*50*	*0*	*102*	*85 - 114*	*50.79*	*0.404*	*20*	
Surr: Dibromofluoromethane	*46.74*	*1.0*	*50*	*0*	*93.5*	*80 - 119*	*47.65*	*1.93*	*20*	
Surr: Toluene-d8	*54.57*	*1.0*	*50*	*0*	*109*	*89 - 112*	*54.21*	*0.675*	*20*	

ALS Houston, US Date: 20-Feb-20

Client:	Bhate Environmental Associates, Inc.
Project:	Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder:	HS20020474

QC BATCH REPORT

Batch ID:	**R356213 (0)**	**Instrument:**	**VOA6**	**Method:**	**VOLATILES ORGANICS BY METHOD 8260C**

The following samples were analyzed in this batch: HS20020474-01 HS20020474-03

ALS Houston, US Date: 20-Feb-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder: HS20020474

QC BATCH REPORT

Batch ID: R356187 (0) **Instrument: UV-2450** **Method: HEXAVALENT CHROMIUM BY SW7196A**

MBLK Sample ID: **MBLK-356187** Units: **mg/L** Analysis Date: **12-Feb-2020 12:09**
Client ID: Run ID: **UV-2450_356187** SeqNo: **5470706** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chromium, Hexavalent	0.0100	0.0100								U

LCS Sample ID: **LCS-356187** Units: **mg/L** Analysis Date: **12-Feb-2020 12:09**
Client ID: Run ID: **UV-2450_356187** SeqNo: **5470707** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chromium, Hexavalent	0.266	0.0100	0.25	0	106	90 - 111				

MS Sample ID: **HS20020474-01MS** Units: **mg/L** Analysis Date: **12-Feb-2020 12:09**
Client ID: **LH18/24-SP650_021120** Run ID: **UV-2450_356187** SeqNo: **5470708** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chromium, Hexavalent	0.215	0.0100	0.25	-0.001	86.4	90 - 111				S

MSD Sample ID: **HS20020474-01MSD** Units: **mg/L** Analysis Date: **12-Feb-2020 12:09**
Client ID: **LH18/24-SP650_021120** Run ID: **UV-2450_356187** SeqNo: **5470709** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chromium, Hexavalent	0.241	0.0100	0.25	-0.001	96.8	90 - 111	0.215	11.4	20	

The following samples were analyzed in this batch: HS20020474-01

ALS Houston, US Date: 20-Feb-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder: **HS20020474**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	19-028-0	27-Mar-2020
California	2919, 2019-2020	30-Apr-2020
Dept of Defense	ANAB L2231 V009	22-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	624-2020	31-Dec-2020
North Dakota	R-193 2019-2020	30-Apr-2020
Oklahoma	2019-067	31-Aug-2020
Texas	T104704231-19-25	30-Apr-2020

ALS Houston, US Date: 20-Feb-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Monthly Effluent Samples
Work Order: HS20020474

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS20020474-01	LH18/24-SP650_021120	Login	2/12/2020 11:16:36 AM	PMG	EXT048
HS20020474-01	LH18/24-SP650_021120	Login	2/12/2020 11:16:36 AM	PMG	WET243
HS20020474-01	LH18/24-SP650_021120	Login	2/12/2020 11:16:36 AM	PMG	MET059
HS20020474-01	LH18/24-SP650_021120	Login	2/12/2020 11:16:36 AM	PMG	VOA112
HS20020474-02	LH18/24-SP650_021120_BIX	Login	2/12/2020 11:16:36 AM	PMG	Sub
HS20020474-03	Trip Blank	Login	2/12/2020 11:16:36 AM	PMG	VOA112

ALS Houston, US Date: 20-Feb-20

Sample Receipt Checklist

Client Name: Bhate Environmental
Work Order: HS20020474
Date/Time Received: **12-Feb-2020 09:05**
Received by: **AC**

Checklist completed by: *Paresh M. Giga* eSignature 12-Feb-2020 Date
Reviewed by: *RJ Modashia* eSignature 12-Feb-2020 Date

Matrices: **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):	0.9c U/C	IR25
Cooler(s)/Kit(s):	45571	
Date/Time sample(s) sent to storage:	2/12/2020 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:

CHAIN OF CUSTODY

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

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

Project No. NWO1312.0150.0 16.0001

Job: GROUNDWATER TREATMENT PLANT MONTHLY EFFLUENT SAMPLES

Prepared By: Scott Beesinger

P.O. Number

HS20020474
Bhate Environmental Associates, Inc.
Longhorn GW Treatment Plant Monthly Effluent Sample

Field Sample I.D.	Sample Matrix	Date / Time	MS / MSD	No. OF CONTAINERS	Analyses: VOLATILES	SILVER, SELENIUM, LEAD, BARIUM	HEXAVALENT CHROMIUM	1, 4 - DIOXANE	PERCHLORATE						Remarks (Preservatives, etc.)	Lab I.D.#
LH18/24-SP650_021120	Water	02/11/20 / 14:00		3	X										HCL	
LH18/24-SP650_021120	Water	02/11/20 / 14:00		2			X	X							NONE	
LH18/24-SP650_021120_BIX	Water	02/11/20 / 14:00		1					X						NONE	
LH18/24-SP650_021120	Water	02/11/20 / 14:00		1		X									HNO3	
Trip Blank	Water	02/11/20		2	X										HCL	

Additional Remarks: 24 HR TAT on VOC's. Standard TAT on all other parameters

Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
Scott Beesinger	02/11/20	14:30	AC	2/12/20	09:05						

For Lab Use Only

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

Remarks: u/c 0.9 IR#25 cf 0.0 45571

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

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

45571

CUSTODY SEAL

Date: 2/11/20 Time: 1430
Name: Scott Beesinger
Company: BHATE

Seal Broken By: SMJ
Date: 02/12/20

45571 FEB 12 2020

Must Deliver Next Business
Time and Tempature Sensitive!

45571

ORIGIN ID:SGRA (303) 597-2450
SCOTT BEESINGER
BHATE ENVIRONMENTAL ASSOCIATES
1203-B EAST GRAND AVE.
PMB202
MARSHALL, TX 75670
UNITED STATES US

SHIP DATE: 09JAN20
ACTWGT: 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) 530-5656
REF: LONGHORN - RJ

RMA:

FedEx Express

FedEx
TRK# 0221 1251 0293 5906

WED - 12 FEB 10:30A
PRIORITY OVERNIGHT

AB SGRA

77099
TX-US
IAH

FM 3879314 11FEB20 GGGA 56AC2/049E/05A2

Case Narrative

Method: 6850
Analysis: Perchlorate
Analysis SOP: LC-MS-CLO4
ALS WO ID(s): 2004545; 2004546; 2004547; 2004548

Client: ALS Laboratories (Houston, TX)
Matrix: Water
ELMS Batch (HBN): 2350 (257242)

General Set Information: There were nineteen 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. 50µL 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 0.45µm Syringe filters.

Holding Times: Holding times were met for all analyses.

Dilutions: Field sample 2004545001 was analyzed and reported from a 1:1,000 dilution. Field sample 2004548012 was re-analyzed and reported from a 1:10 dilution. The reporting limits have been adjusted accordingly.

Method QC data: The method blank (LMB 695966) was less than 1/2 the CRDL. The recovery for the LCS (695963) was within acceptable parameters.

MS/MSD Analysis: MS/MSD was performed on samples 2004548015/16 (Client ID: 04WW11-200204). 3.0µL of Working Standard Solution Horizon ID 49947 was added to 10.0mL of sample preparation. The spike target was 3.µg/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 µg/L. Results were calculated in µg/L by the equation (A)x(B),

where: A = Analyte concentration from the standard curve (µg/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 – 695964) is reported from the analysis of the Laboratory Control Sample (LCS – 695963) at a level of 3.0µg/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 17JAND16/20/27. Field sample 2004548008 was re-analyzed at a 1:5 dilution and undiluted to confirm the positive result and split peak chromatography.

Thomas Bosch — Analyst
February 18, 2020 — Date

ANALYTICAL REPORT

Report Date: February 18, 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: **34-2004546**
Project ID: HS20020474
Purchase Order: HS20020474
Project Manager Kevin W. Griffiths

Client Sample ID	Lab ID	Collect Date	Receive Date	Sampling Site
LH18/24-SP650_021120_BIX Water	2004546001	02/11/20	02/13/20	HS20020474-02

ANALYTICAL REPORT

Workorder: 34-2004546
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: **LH18/24-SP650_021120_BIX Water**
Lab ID: 2004546001
Matrix: Water

Sampling Site: HS20020474-02
Media: 125 mL Nalgene
Sampling Parameter: NA

Collected: 02/11/2020
Received: 02/13/2020

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable

Analysis: EPA 6850, DoD QSM Water
Batch: ELMS/2350 (HBN: 257242)
Analyzed: 02/17/2020 09:57

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

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 02/18/2020 09:40	/S/ Stephen Brose 02/18/2020 13:55

Laboratory Contact Information

ALS Environmental
960 W Levoy Drive
Salt Lake City, Utah 84123

Phone: (801) 266-7700
Email: alslt.lab@ALSGlobal.com
Web: www.alsslc.com

ANALYTICAL REPORT

Workorder: 34-2004546
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.
The following was provided by the client: Sample ID, Collection Date, Sampling Location, Media Type, Sampling Parameter.
Collection Date, Media Type, and Sampling Parameter can potentially affect the validity of the results.
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

Analysis Information

Workorder: 2004546

Limits:	Client SOW/Contract Specified	**Preparation:**	NA	**Analysis:**	EPA 6850, DoD QSM
Basis:	DoD QSM	**Batch:**	NA	**Batch:**	ELMS/2350 (HBN: 257242)
		Prepared By:	NA	**Analyzed By:**	Thomas Bosch

Blank

LMB: 695966
Analyzed: 02/17/2020 09:30
Units: ug/L

Analyte	Result	MDL	RL
Perchlorate	ND	1	2.00

Laboratory Control Sample

LCS: 695963
Analyzed: 02/17/2020 09:02
Dilution: 1
Units: ug/L

Analyte	Result	Target	% Rec	QC Limits	
Perchlorate	2.99	3.00	99.8	78.8	123.8

Matrix Spike - Matrix Spike Duplicate

Sample: 2004548009	**MS:** 2004548015	**MSD:** 2004548016
Analyzed: 02/17/2020 12:30	**Analyzed:** 02/17/2020 14:54	**Analyzed:** 02/17/2020 15:08
Dilution: 1	**Dilution:** 1	**Dilution:** 1
Units: ug/L	**Units:** ug/L	**Units:** ug/L

Analyte	Result	Result	Target	% Rec	QC Limits		Result	% Rec	RPD	QC Limits	
Perchlorate	ND	3.2	3	107	78.8	123.8	3.1	105	3.17	0.0	20.0

QC Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Analyst	Peer Review
/S/ Thomas Bosch	/S/ Stephen Brose
02/18/2020 09:45	02/18/2020 13:55

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



2004546

W 2004546

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: **Dept of Defense** **COC ID:** **13320**

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:
Email:

INVOICE INFORMATION:

Company: ALS Houston
Contact: Accounts Payable
Address: 10450 Stancliff Rd, Ste 210
Phone: +1 281 530 5656
Reference: HS20020474
TSR: Danielle Winnings

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS20020474-02**	**LH18/24-SP650_021120_BIX**	**Water**	**11 Feb 2020 14:00**
	SUB_Perch-6850			13 Feb 2020

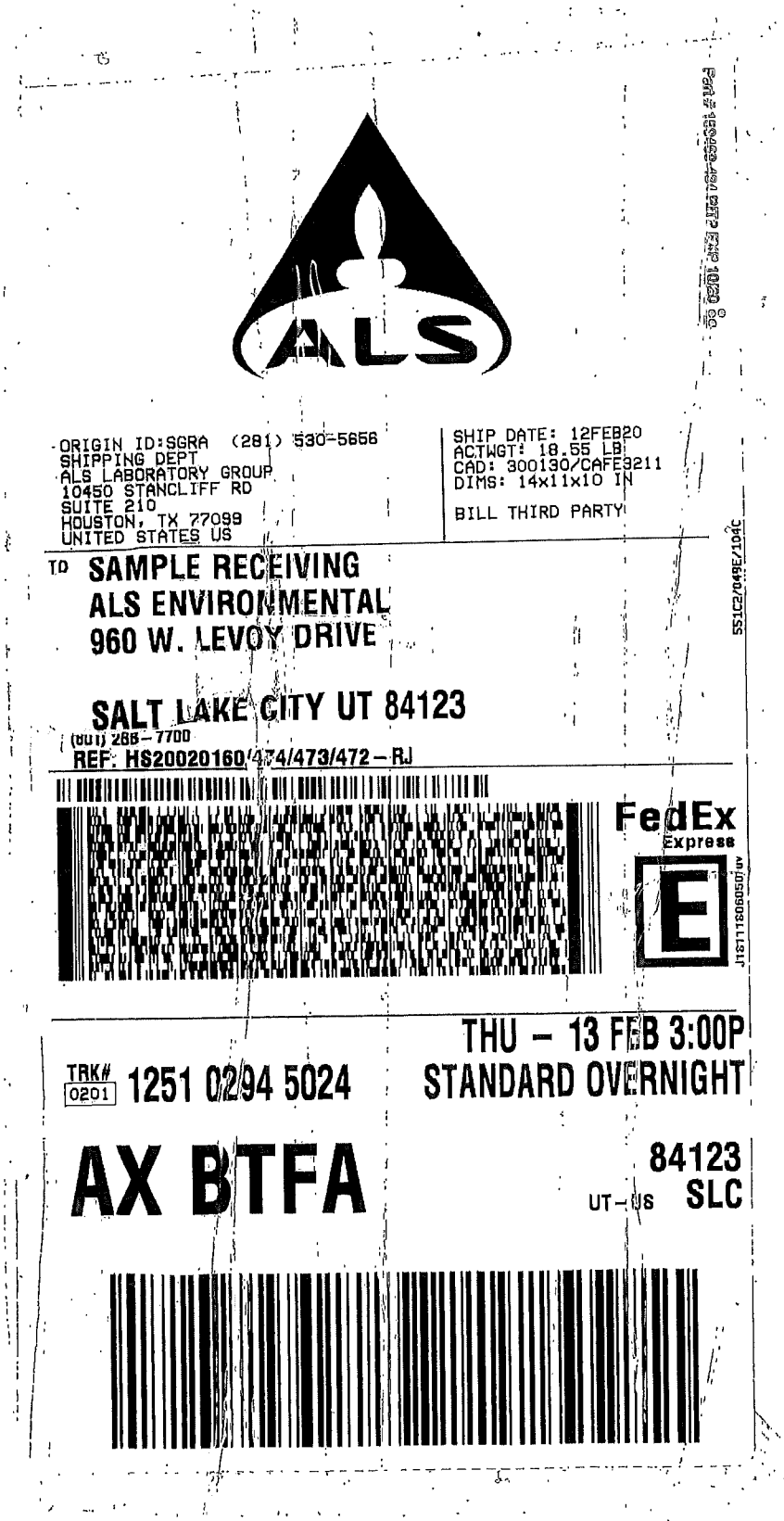
Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.

QC Level: DOD IV (DoD Data Package)

Relinquished By: NA Date/Time: 2-12-20 13:00

Received By: Jamie Van Fussell Date/Time: 02-13-20 9:46

Cooler ID(s): Temperature(s):



ORIGIN ID:SGRA (281) 530-5656
SHIPPING DEPT
ALS LABORATORY GROUP
10450 STANCLIFF RD
SUITE 210
HOUSTON, TX 77099
UNITED STATES US

SHIP DATE: 12FEB20
ACTWGT: 18.55 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) 266-7700
REF: HS20020160/474/473/472-RJ

FedEx Express

THU - 13 FEB 3:00P
STANDARD OVERNIGHT

TRK# 0201 1251 0294 5024

AX BTFA

84123
UT-US SLC

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: 02-13-20 9:46

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	good	2 °C	4		°C	7		°C
2		°C	5		°C	8		°C
3		°C	6		°C	9		°C

Taken By: [signature] (Signature) T. Vantassell (Printed Name) 02-13-20 (Date)

CLIENT-RELATED INFORMATION

☐ Missing Cooler	☐ Missing Samples/Bottles	☐ Incorrect Preservation	☐ Insufficient Sample Volume
☐ Cooler Conditions	☐ Broken/Leaking Samples	☐ pH Criteria Not Met	☐ Chain of Custody Problems
☐ Missing Paperwork	☐ Incorrect Bottle Type	☐ Residual Chlorine Present	☐ Other:
☐ Missing/Incorrect Bottle Labels	☐ Cooler Temperatures Out of Range	☐ 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: _____ (Printed Name) Returned to Sample Receipt by: _____ (Signature) Date: _____

ALS Environmental
CHAIN-OF-CUSTODY

Project / Job / Task: HS20020474-02	***Split:***	**Workorder ID: 2004546**	**Level:** ENV_LVL4
Client: ALS Environmental (Houston)		**Account:** 8101	**Type:** 125Poly
Comments:			**Preservatives** COOL

Requested Analysis

Item	Collect Date/Time	Sample ID	Lab ID	QC	Matrix	Containers ID(s)	Containers Count	EPA 6850, DoD QSM
1	02/11/2020 14:00	LH18/24-SP650_021120_BIX Water	2004546001		Water	A	1	A

40 of 154

ORIGINAL FIELD SAMPLE CHAIN-OF-CUSTODY

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location
VanTassell, Tami	02/13/2020 09:46	ALS Sample Receiving	Sample Login
Tami VanTassell	02-13-20 15:30	15C	Storage
R.33.1	2.14.22/12:25	T. Bosch	CLO4 analysis

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

Batch Worklist

Batch: ELMS/ 2350
Rule: EPA 6850, DoD QSM Water

Created: 2/17/2020 07:43
Analyst: T. Bosch

Instrument:
Status: WP

HBN: 257242

Workorder: 2004545 [ENV_LVL4]
Workorder: 2004546 [ENV_LVL4]
Workorder: 2004547 [ENV_LVL4]
Workorder: 2004548 [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	695962	CCV for HBN 257242 [ELMS/2350]				CCV	3		E685041C3Q	5311		2/26/2020	
2	695963	LCS for HBN 257242 [ELMS/2350]				LCS	3		E6850Q413Q	5311		2/26/2020	
3	695964	RLVS for HBN 257242 [ELMS/2350				RLVS	3		E685041C3Q	5311		2/26/2020	
4	695965	ICS for HBN 257242 [ELMS/2350]				ICS	3		E6850..D3Q	5311		2/26/2020	
5	695966	LMB for HBN 257242 [ELMS/2350]				LMB	3		E6850Q413Q	5311		2/26/2020	
6	2004545001	LH18/24-SP140_021120				SAMPLE	3	2004545001-A	E6850Q41.3	5480	3/10/2020	2/26/2020	
7	2004546001	LH18/24-SP650_021120_BIX Water				SAMPLE	3	2004546001-A	E6850Q41.3	5480	3/10/2020	2/26/2020	
8	2004547001	LH18/24-SP650_021120_BIX Water				SAMPLE	3	2004547001-A	E6850Q41.3	5480	3/10/2020	2/26/2020	
9	2004548001	LHSMW01-200203				SAMPLE	3	2004548001-A	E6850Q41.3	5480	3/2/2020	2/26/2020	
10	2004548002	04WW08-200203				SAMPLE	3	2004548002-A	E6850Q41.3	5480	3/2/2020	2/26/2020	
11	2004548003	04WW04-200203				SAMPLE	3	2004548003-A	E6850Q41.3	5480	3/2/2020	2/26/2020	
12	2004548004	04WW06-200203				SAMPLE	3	2004548004-A	E6850Q41.3	5480	3/2/2020	2/26/2020	
13	2004548005	LHSMW02-200203				SAMPLE	3	2004548005-A	E6850Q41.3	5480	3/2/2020	2/26/2020	
14	2004548006	LHSMW02-200203-FD				SAMPLE	3	2004548006-A	E6850Q41.3	5480	3/2/2020	2/26/2020	
15	2004548007	04WW02-200203				SAMPLE	3	2004548007-A	E6850Q41.3	5480	3/2/2020	2/26/2020	
16	695967	CCV for HBN 257242 [ELMS/2350]				CCV	3		E685041C3Q	5311		2/26/2020	
17	2004548008	04WW01-200204				SAMPLE	3	2004548008-A	E6850Q41.3	5480	3/3/2020	2/26/2020	
18	2004548009	04WW11-200204				SAMPLE	3	2004548009-A	E6850Q41.3	5480	3/3/2020	2/26/2020	
19	2004548010	04WW05-200204				SAMPLE	3	2004548010-A	E6850Q41.3	5480	3/3/2020	2/26/2020	
20	2004548011	04WW10-200204				SAMPLE	3	2004548011-A	E6850Q41.3	5480	3/3/2020	2/26/2020	
21	2004548012	04WW07-200204				SAMPLE	3	2004548012-A	E6850Q41.3	5480	3/3/2020	2/26/2020	
22	2004548013	04WW09-200204				SAMPLE	3	2004548013-A	E6850Q41.3	5480	3/3/2020	2/26/2020	
23	2004548014	04WW09-200204-FD				SAMPLE	3	2004548014-A	E6850Q41.3	5480	3/3/2020	2/26/2020	
24	2004548015	04WW11-200204 MS				MS	3	2004548015-A	E6850Q41.3	5480	3/3/2020	2/26/2020	
25	2004548016	04WW11-200204 MSD				MSD	3	2004548016-A	E6850Q41.3	5480	3/3/2020	2/26/2020	
26	695968	CCV for HBN 257242 [ELMS/2350]				CCV	3		E685041C3Q	5311		2/26/2020	

Batch Worklist

Pos	Lab ID	Sample ID	Prep Initial	Prep Final	Dust Weight	Type	Mx	Container	Procedure	Mgr	Expire Date	Due Date	Run Date
27	696082	CCV for HBN 257242 [ELMS/2350]				CCV	3		E685041C3Q	5311		2/26/2020	

00969667



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Analytical Documentation

Analyst Write-up

ALS Work Order #'s & Sample #( )'s: 2004545 (001); 2004546 (001); 2004547 (001); 2004548 (001-16)
ELMS Batch/HBN ID: 2350 (256242)
Prep Date: 02/14/2020 Analysis Date: 02/17/2020 Analyst: Tom Bosch
Analyte: **Perchlorate** Matrix: **Water** Method: **6850**
Sequence: \\HPCHEM\1\SEQUENCE\CLO4\2020\FEB\17FEB20D.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 695963; Target = 3.0µg/L. ASTM type II water was used for LMB 695966.

MS/MSD: The Matrix Spike and duplicate (MS/MSD) was performed on samples 2004548015/16 (Client ID: 04WW11-200204). 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 2004545001 was analyzed and reported from a 1:1,000 dilution. Field sample 2004548012 was re-analyzed and reported from a 1:10 dilution. The reporting limits have been adjusted accordingly. Field sample 2004548008 was re-analyzed at a 1:5 dilution and undiluted to confirm the positive result and split peak chromatography.
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\2020\FEB\HBN# or through NuGenesis\Tree\PrintData\LCMS\DefaultView.
4) Notebook: \\alsltws013\ORGANIC\BOSCH\LCMS\Perchlorates\Waters\2020\DOD\256242-DoD-ALS-Hstn LCMS4 or through \\ALSLTWS013\DATAREVIEW\HBN#
5) The Reporting Limit Verification Standard (RLVS – 695964) is reported from the analysis of the Laboratory Control Sample (LCS – 695963) 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 17JAND16/20/27.

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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 **Batch(es)/SDG:** ELMS: 2350 HBN: 257242 **Sample Set IDs if Applicable:** 2004545/2004546/2004547/2004548	**Analyst Initials**	**Reviewer Initials**
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
MFG: ALS/SLC
MFG Lot: TNB: 09/20/2019
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 09/20/2019 03:09PM

Amount: 10 mL
Expires: 07/25/2020
Usable: Yes
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®

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Fax (203)786-5287
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CERTIFICATE OF ANALYSIS

S 43659

AccuTrace™ Reference Standard

Catalog No: IC-PER-10X-1
Description: Perchlorate Standard
Element: Perchlorate (ClO_4)
SRM: Ind. Std.
Lot: 218065075
Matrix: Water
Hazards: *Refer to SDS for complete safety information*

Signal Word: None

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

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

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

ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

ISO Guide 34 Reference Material

Product Number: ICC-013
Lot Number: CP-0860

S 36748

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.

ANAB ACCREDITED ACCREDITATION REFERENCE MATERIAL PRODUCER

ANAB ACCREDITED ACCREDITATION TESTING LABORATORY

ISO 9001 Registered Quality System – TUV USA

250 SMITH STREET • NORTH KINGSTOWN, RHODE ISLAND 02852 • WWW.ULTRASCI.COM

ULTRA SCIENTIFIC
Analytical Solutions

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

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

ANAB ACCREDITED ISO/IEC 17025 TESTING LABORATORY

ISO 9001 Registered Quality System – TUV USA

Cambridge Isotope Laboratories, Inc.

Certificate of Analysis

S 47863

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: ≥98%

MW*: 130.44
** For isotopically labeled compounds, MW listed is for the fully enriched product.*

$NaCl^{18}O_4$

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 ± 1.0 µg/mL (k=2)
Chemical Purity of Neat Material(s)	98%
LC/MS for Concentration	105.4 ± 1.1 µg/mL (k=2)

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

00969686

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
*	695962 CCV@25	Vial 71	1	Control	1	1.92768e6	7.930	24.86639
*	695963 LCS@3.	Vial 72	1	Control	2	2.01219e5	7.529	2.99456
*	695964 ICS@3.0	Vial 73	1	Control	3	1.44924e5	7.156	2.76338
*	695966 LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
*	2004545001 100	Vial 75	1	Sample	5	9.91954e6	7.281	1.06828e4
*	2004546001	Vial 76	1	Sample	6	0.00000	0.000	0.00000
*	2004547001	Vial 77	1	Sample	7	0.00000	0.000	0.00000
*	2004548001	Vial 78	1	Sample	8	0.00000	0.000	0.00000
*	2004548002	Vial 79	1	Sample	9	0.00000	0.000	0.00000
*	2004548003	Vial 80	1	Sample	10	0.00000	0.000	0.00000
*	2004548004	Vial 81	1	Sample	11	0.00000	0.000	0.00000
*	2004548005	Vial 82	1	Sample	12	0.00000	0.000	0.00000
*	2004548006	Vial 83	1	Sample	13	0.00000	0.000	0.00000
*	2004548007	Vial 84	1	Sample	14	0.00000	0.000	0.00000
*	695967 CCV@25	Vial 71	1	Control	15	1.72959e6	7.246	25.26416
*	2004548008	Vial 85	1	Sample	16	7.48879e5	7.008	18.97843
*	2004548009	Vial 86	1	Sample	17	0.00000	0.000	0.00000
*	2004548010	Vial 87	1	Sample	18	0.00000	0.000	0.00000
*	2004548011	Vial 88	1	Sample	19	0.00000	0.000	0.00000
*	2004548012	Vial 89	1	Sample	20	4.27720e6	6.875	94.65050
*	2004548013	Vial 90	1	Sample	21	1.18569e6	6.905	17.51257
*	2004548014	Vial 91	1	Sample	22	1.20862e6	6.879	21.88966
*	2004548015 MS	Vial 92	1	Sample	23	2.05915e5	6.973	3.19687
*	2004548016 MSD	Vial 93	1	Sample	24	1.99352e5	7.026	3.13852
*	2004545001 1K	Vial 94	1	Sample	25	6.98274e5	7.287	1.06347e4
*	695968 CCV@25	Vial 71	1	Control	26	1.54321e6	7.193	25.75234
*	2004548008 RE	Vial 85	1	Sample	27	6.97532e5	6.972	18.60668
*	2004548012 10X	Vial 95	1	Sample	28	5.64190e5	7.108	86.45192
*	2004548008 5X	Vial 96	1	Sample	29	2.64237e5	7.093	17.29449
*	696082 CCV@25	Vial 71	1	Control	30	1.61866e6	7.208	26.26917

TB 2.18.20

N.R. – NOT REPORTED

N.R.

N.R.

N.R. – NOT REPORTED (RERUN + DILUTION) TB 2.18.20

#	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
*	695962 CCV@25	Vial 71	1	Control	1	2.65029e5	7.950	5.00000
*	695963 LCS@3.	Vial 72	1	Control	2	2.47234e5	7.555	5.00000
*	695964 ICS@3.0	Vial 73	1	Control	3	1.92731e5	7.177	5.00000
*	695966 LMB	Vial 74	1	Control	4	2.29809e5	7.346	5.00000
*	2004545001 100	Vial 75	1	Sample	5	2.35908e5	7.306	500.00000
*	2004546001	Vial 76	1	Sample	6	2.19401e5	7.052	5.00000
*	2004547001	Vial 77	1	Sample	7	2.15048e5	7.060	5.00000
*	2004548001	Vial 78	1	Sample	8	2.54205e5	7.021	5.00000
*	2004548002	Vial 79	1	Sample	9	1.96395e5	6.630	5.00000
*	2004548003	Vial 80	1	Sample	10	2.66482e5	7.157	5.00000
*	2004548004	Vial 81	1	Sample	11	2.45154e5	7.031	5.00000
*	2004548005	Vial 82	1	Sample	12	2.58211e5	6.986	5.00000
*	2004548006	Vial 83	1	Sample	13	2.44279e5	6.981	5.00000
*	2004548007	Vial 84	1	Sample	14	2.65820e5	7.133	5.00000
*	695967 CCV@25	Vial 71	1	Control	15	2.33668e5	7.257	5.00000
*	2004548008	Vial 85	1	Sample	16	1.38230e5	7.032	5.00000
*	2004548009	Vial 86	1	Sample	17	2.27262e5	6.903	5.00000
*	2004548010	Vial 87	1	Sample	18	2.50415e5	6.920	5.00000
*	2004548011	Vial 88	1	Sample	19	2.67412e5	6.947	5.00000
*	2004548012	Vial 89	1	Sample	20	1.19387e5	6.898	5.00000
*	2004548013	Vial 90	1	Sample	21	2.38618e5	6.920	5.00000
*	2004548014	Vial 91	1	Sample	22	1.91102e5	6.901	5.00000
*	2004548015 MS	Vial 92	1	Sample	23	2.37178e5	7.001	5.00000

#*	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
*	2004548016 MSD	Vial 93	1	Sample	24	2.33840e5	7.035	5.00000
*	2004545001 1K	Vial 94	1	Sample	25	2.37891e5	7.310	5000.00000
*	695968 CCV@25	Vial 71	1	Control	26	2.04125e5	7.215	5.00000
*	2004548008 RE	Vial 85	1	Sample	27	1.31527e5	6.998	5.00000
*	2004548012 10X	Vial 95	1	Sample	28	2.38166e5	7.128	50.00000
*	2004548008 5X	Vial 96	1	Sample	29	2.81500e5	7.121	25.00000
*	696082 CCV@25	Vial 71	1	Control	30	2.09447e5	7.223	5.00000

#*	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
*	695962 CCV@25	Vial 71	1	Control	1	5.76713e5	7.946	24.43478
*	695963 LCS@3.	Vial 72	1	Control	2	6.49552e4	7.544	3.08073
*	695964 ICS@3.0	Vial 73	1	Control	3	4.99792e4	7.163	3.03921
*	695966 LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
*	2004545001 100	Vial 75	1	Sample	5	2.92982e6	7.295	1.05759e4
*	2004546001	Vial 76	1	Sample	6	0.00000	0.000	0.00000
*	2004547001	Vial 77	1	Sample	7	0.00000	0.000	0.00000
*	2004548001	Vial 78	1	Sample	8	0.00000	0.000	0.00000
*	2004548002	Vial 79	1	Sample	9	0.00000	0.000	0.00000
*	2004548003	Vial 80	1	Sample	10	0.00000	0.000	0.00000
*	2004548004	Vial 81	1	Sample	11	0.00000	0.000	0.00000
*	2004548005	Vial 82	1	Sample	12	0.00000	0.000	0.00000
*	2004548006	Vial 83	1	Sample	13	0.00000	0.000	0.00000
*	2004548007	Vial 84	1	Sample	14	0.00000	0.000	0.00000
*	695967 CCV@25	Vial 71	1	Control	15	5.12273e5	7.259	24.60220
*	2004548008	Vial 85	1	Sample	16	2.46751e5	7.031	20.35009
*	2004548009	Vial 86	1	Sample	17	0.00000	0.000	0.00000
*	2004548010	Vial 87	1	Sample	18	0.00000	0.000	0.00000
*	2004548011	Vial 88	1	Sample	19	0.00000	0.000	0.00000
*	2004548012	Vial 89	1	Sample	20	1.38274e6	6.890	100.27945
*	2004548013	Vial 90	1	Sample	21	3.97137e5	6.920	19.06294
*	2004548014	Vial 91	1	Sample	22	4.02089e5	6.893	23.69193
*	2004548015 MS	Vial 92	1	Sample	23	7.45778e4	6.989	3.70934
*	2004548016 MSD	Vial 93	1	Sample	24	7.01320e4	7.029	3.53314
*	2004545001 1K	Vial 94	1	Sample	25	2.11343e5	7.302	1.04716e4
*	695968 CCV@25	Vial 71	1	Control	26	4.53507e5	7.209	24.90409
*	2004548008 RE	Vial 85	1	Sample	27	2.26847e5	6.989	19.70833
*	2004548012 10X	Vial 95	1	Sample	28	1.80717e5	7.130	89.77314
*	2004548008 5X	Vial 96	1	Sample	29	8.81854e4	7.119	18.47589
*	696082 CCV@25	Vial 71	1	Control	30	4.74563e5	7.222	25.35553

*** End of Report ***

Sequence Table:

Method and Injection Info Part:

Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
1	Vial 71	695962 CCV@25	CLO4-AQN	1	Ctrl Samp		
2	Vial 72	695963 LCS@3.	CLO4-AQN	1	Ctrl Samp		
3	Vial 73	695964 ICS@3.0	CLO4-AQN	1	Ctrl Samp		
4	Vial 74	695966 LMB	CLO4-AQN	1	Ctrl Samp		
5	Vial 75	2004545001 100	CLO4-AQN	1	Sample		
6	Vial 76	2004546001	CLO4-AQN	1	Sample		
7	Vial 77	2004547001	CLO4-AQN	1	Sample		
8	Vial 78	2004548001	CLO4-AQN	1	Sample		
9	Vial 79	2004548002	CLO4-AQN	1	Sample		
10	Vial 80	2004548003	CLO4-AQN	1	Sample		
11	Vial 81	2004548004	CLO4-AQN	1	Sample		
12	Vial 82	2004548005	CLO4-AQN	1	Sample		
13	Vial 83	2004548006	CLO4-AQN	1	Sample		
14	Vial 84	2004548007	CLO4-AQN	1	Sample		
15	Vial 71	695967 CCV@25	CLO4-AQN	1	Ctrl Samp		
16	Vial 85	2004548008	CLO4-AQN	1	Sample		
17	Vial 86	2004548009	CLO4-AQN	1	Sample		
18	Vial 87	2004548010	CLO4-AQN	1	Sample		
19	Vial 88	2004548011	CLO4-AQN	1	Sample		
20	Vial 89	2004548012	CLO4-AQN	1	Sample		
21	Vial 90	2004548013	CLO4-AQN	1	Sample		
22	Vial 91	2004548014	CLO4-AQN	1	Sample		
23	Vial 92	2004548015 MS	CLO4-AQN	1	Sample		
24	Vial 93	2004548016 MSD	CLO4-AQN	1	Sample		
25	Vial 94	2004545001 1K	CLO4-AQN	1	Sample		
26	Vial 71	695968 CCV@25	CLO4-AQN	1	Ctrl Samp		
27	Vial 85	2004548008 RE	CLO4-AQN	1	Sample		
28	Vial 95	2004548012 10X	CLO4-AQN	1	Sample		
29	Vial 96	2004548008 5X	CLO4-AQN	1	Sample		
30	Vial 71	696082 CCV@25	CLO4-AQN	1	Ctrl Samp		

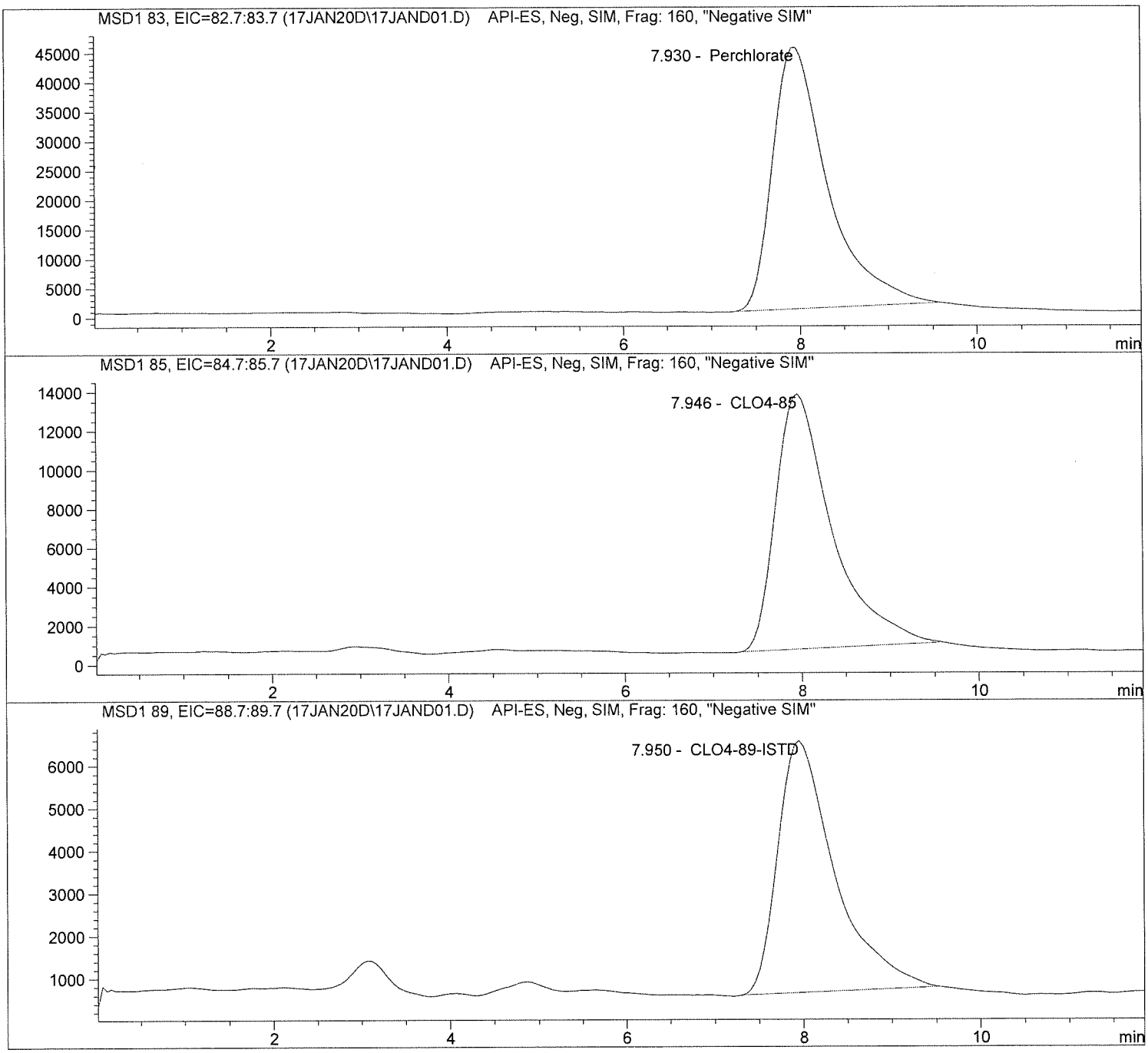
TB 2.18.20

Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND01.D Sample Name: 695962 CCV@25

Injection Date:	2/17/2020 08:48:29	Seq Line:	1
Sample Name:	695962 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: 2/17/2020 15:42:52

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND01.D Sample Name: 695962 CCV@25

Injection Date:	2/17/2020 08:48:29	Seq Line:	1
Sample Name:	695962 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: 2/17/2020 15:42:52

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
7.930	PBA	1927676.2	24.8664	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.946	PBA	576713.4	24.4348	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.950	PBA	265029.5	5.0000	CLO4-89-ISTD

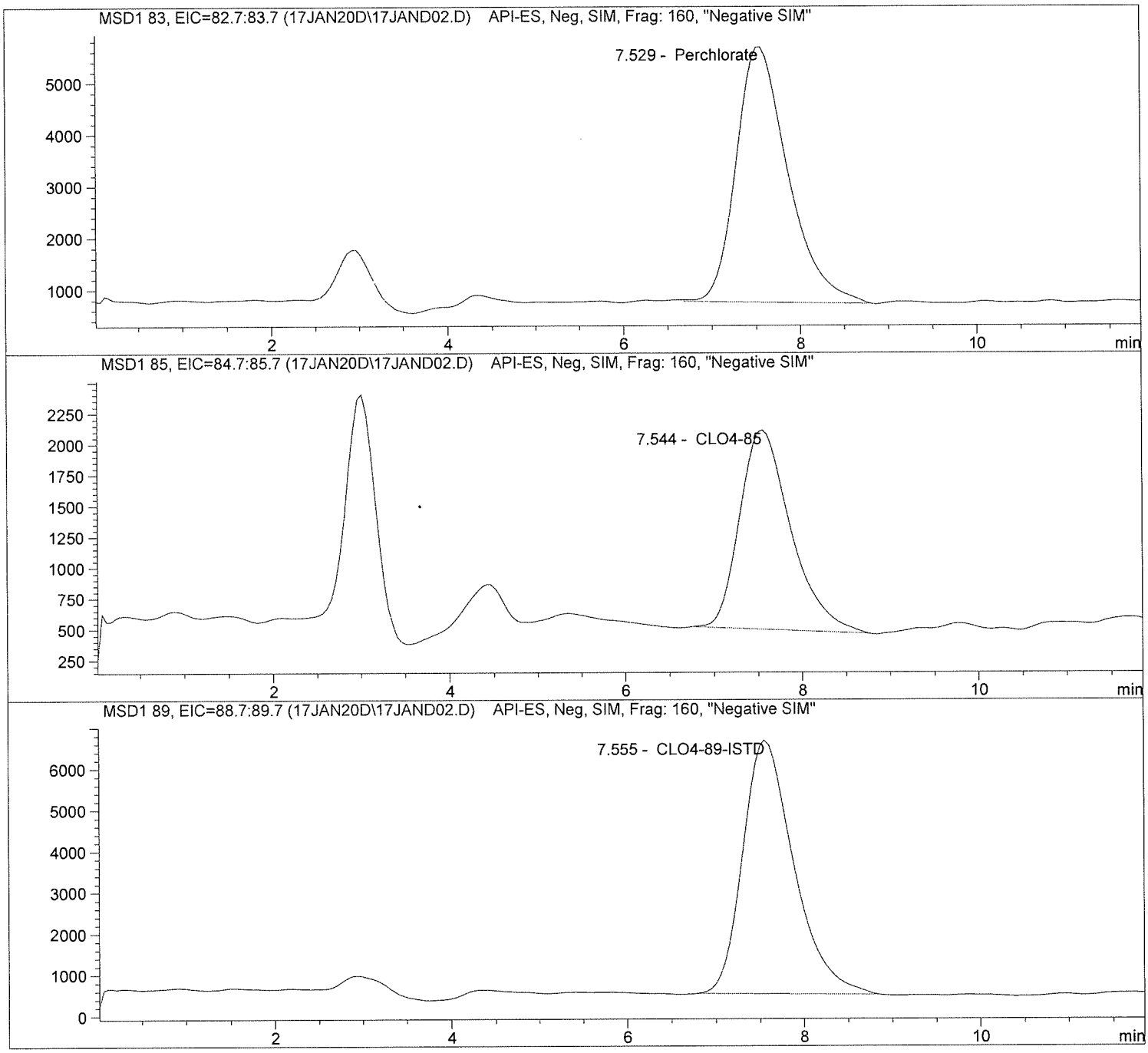
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND02.D Sample Name: 695963 LCS@3.

Injection Date:	2/17/2020 09:02:20	Seq Line:	2
Sample Name:	695963 LCS@3.	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: 2/17/2020 15:42:52

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND02.D Sample Name: 695963 LCS@3.

Injection Date:	2/17/2020 09:02:20	Seq Line:	2
Sample Name:	695963 LCS@3.	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: 2/17/2020 15:42:52

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
7.529	BBA	201219.2	2.9946	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.544	PBA	64955.2	3.0807	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.555	BBA	247234.1	5.0000	CLO4-89-ISTD

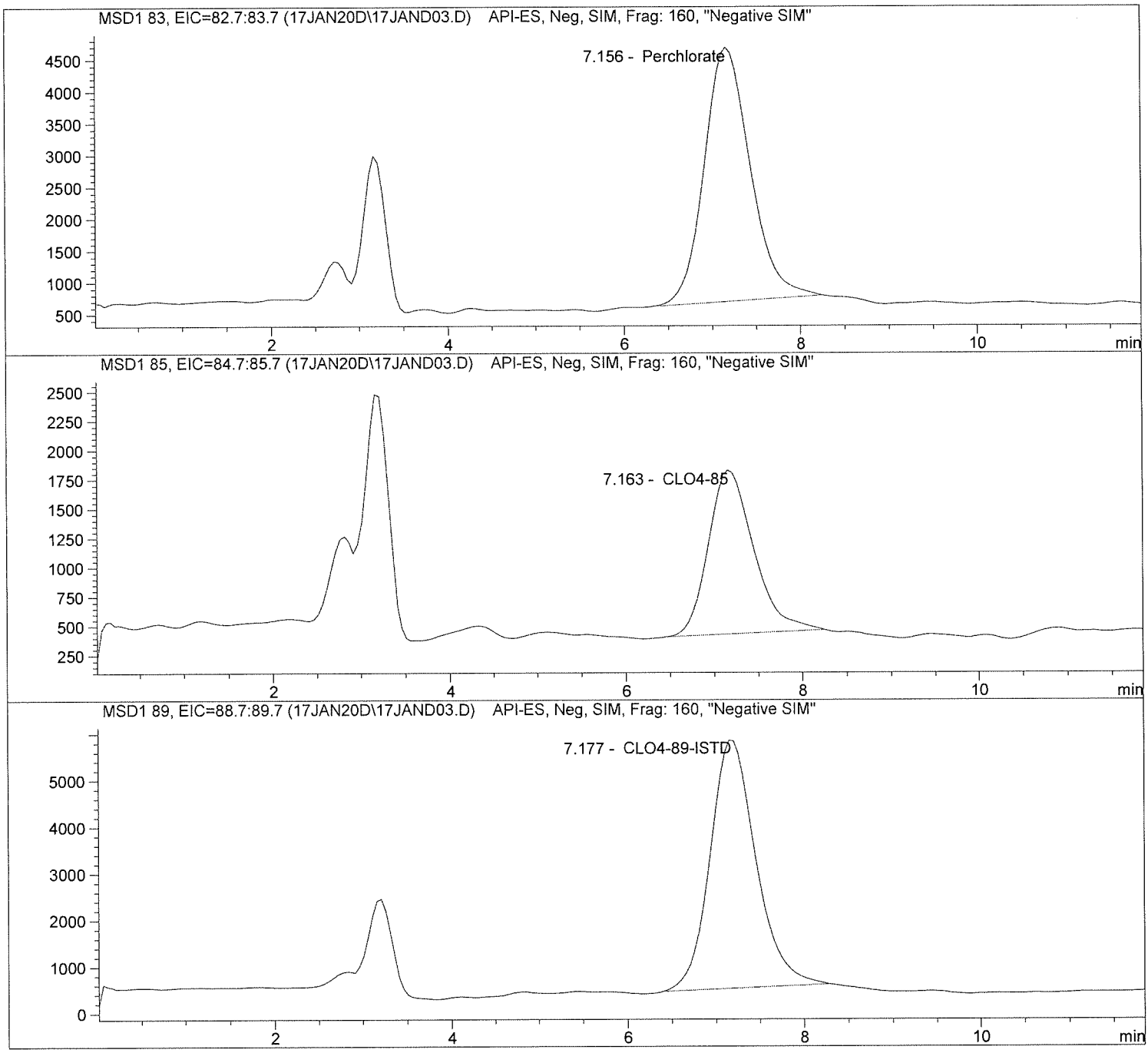
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND03.D Sample Name: 695964 ICS@3.0

Injection Date:	2/17/2020 09:16:11	Seq Line:	3
Sample Name:	695964 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: 2/17/2020 15:42:52

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND03.D Sample Name: 695964 ICS@3.0

Injection Date:	2/17/2020 09:16:11	Seq Line:	3
Sample Name:	695964 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: 2/17/2020 15:42:52

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
7.156	BBA	144924.0	2.7634	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.163	PBA	49979.2	3.0392	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.177	PBA	192730.7	5.0000	CLO4-89-ISTD

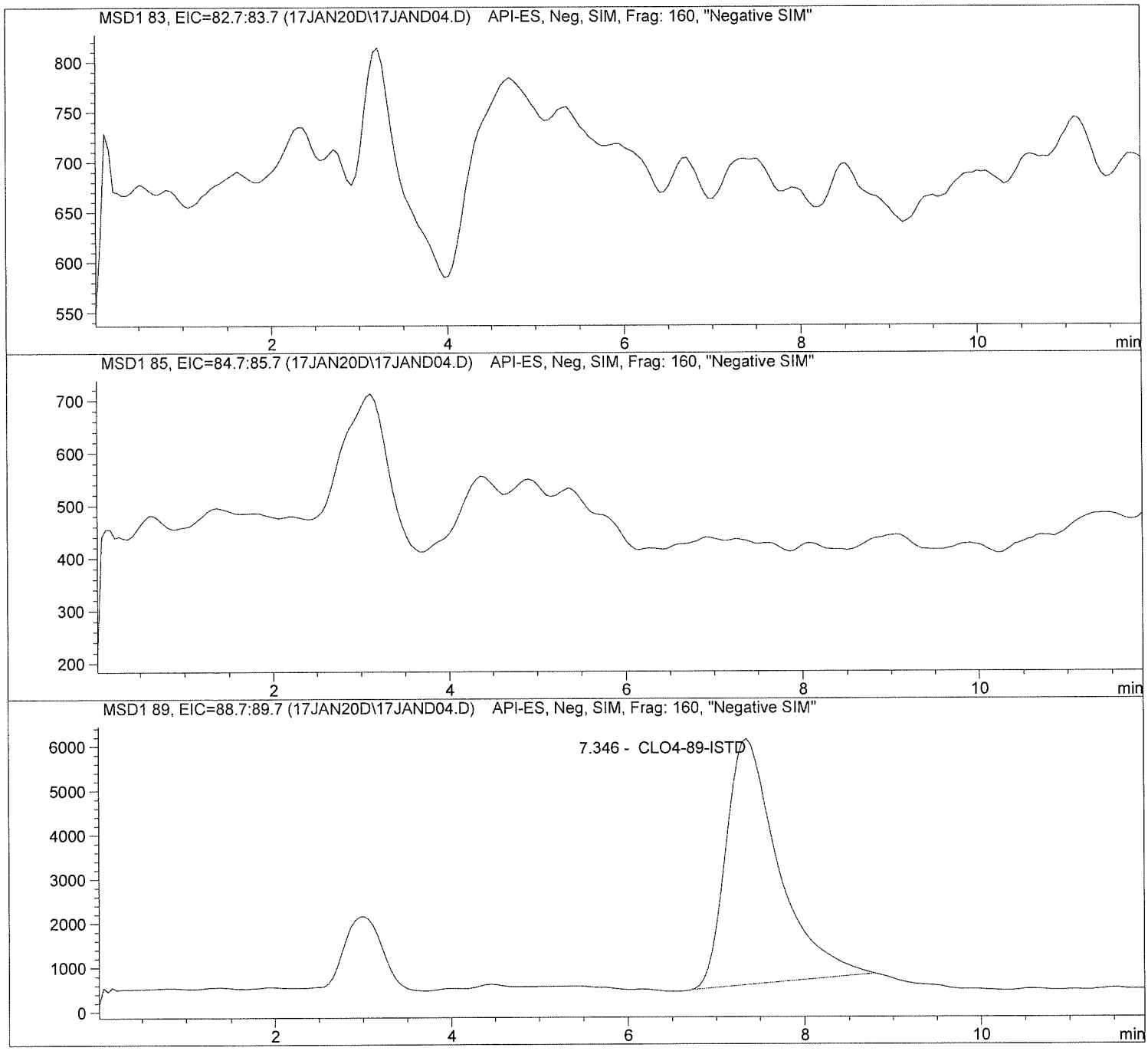
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND04.D Sample Name: 695966 LMB

Injection Date:	2/17/2020 09:30:08	Seq Line:	4
Sample Name:	695966 LMB	Location:	Via1 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: 2/17/2020 15:42:52

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND04.D Sample Name: 695966 LMB

Injection Date:	2/17/2020 09:30:08	Seq Line:	4
Sample Name:	695966 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: 2/17/2020 15:42:52

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
7.346	PBA	229809.2	5.0000	CLO4-89-ISTD

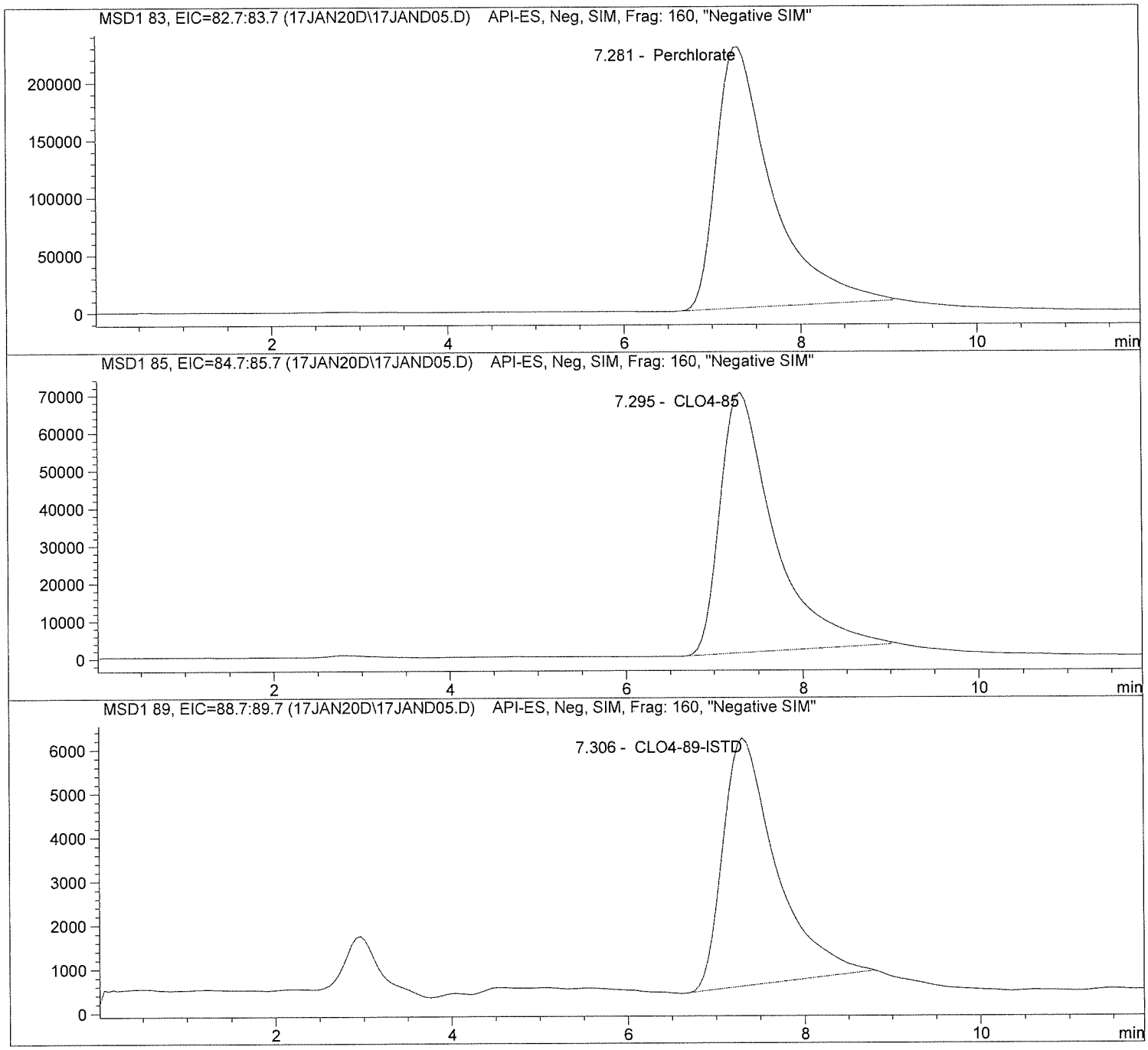
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND05.D Sample Name: 2004545001 100

Injection Date:	2/17/2020 09:44:01	Seq Line:	5
Sample Name:	2004545001 100	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: 2/17/2020 15:42:52

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND05.D Sample Name: 2004545001 100

Injection Date:	2/17/2020 09:44:01	Seq Line:	5
Sample Name:	2004545001 100	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:	2/17/2020 15:42:52

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
7.281	PBA	9919537.0	10682.7974	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.295	PBA	2929815.8	10575.9042	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.306	PBA	235908.1	500.0000	CLO4-89-ISTD

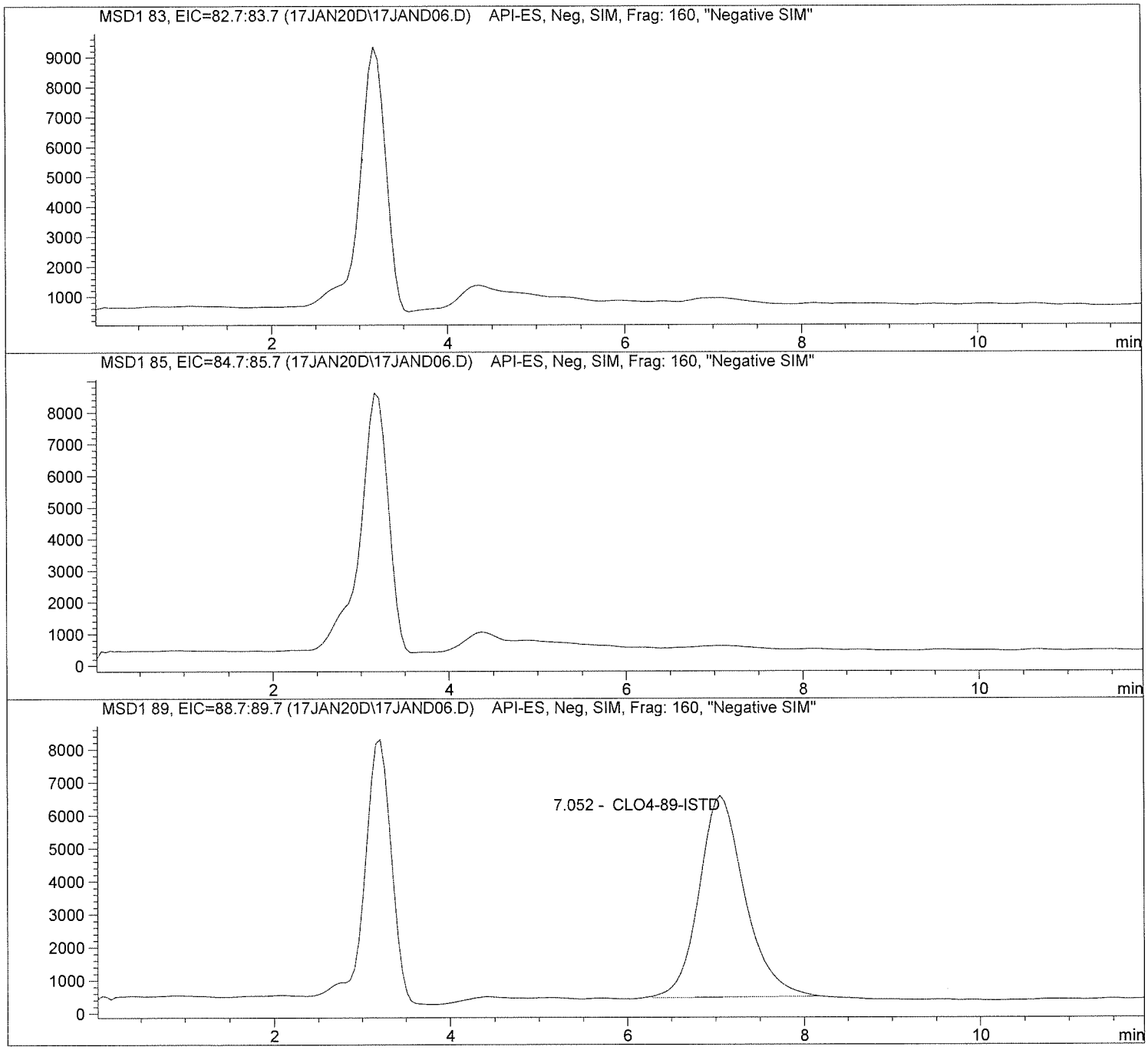
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND06.D Sample Name: 2004546001

Injection Date:	2/17/2020 09:57:56	Seq Line:	6
Sample Name:	2004546001	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: 2/17/2020 15:42:52

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND06.D Sample Name: 2004546001

Injection Date:	2/17/2020 09:57:56	Seq Line:	6
Sample Name:	2004546001	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: 2/17/2020 15:42:52

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
7.052	BBA	219400.8	5.0000	CLO4-89-ISTD

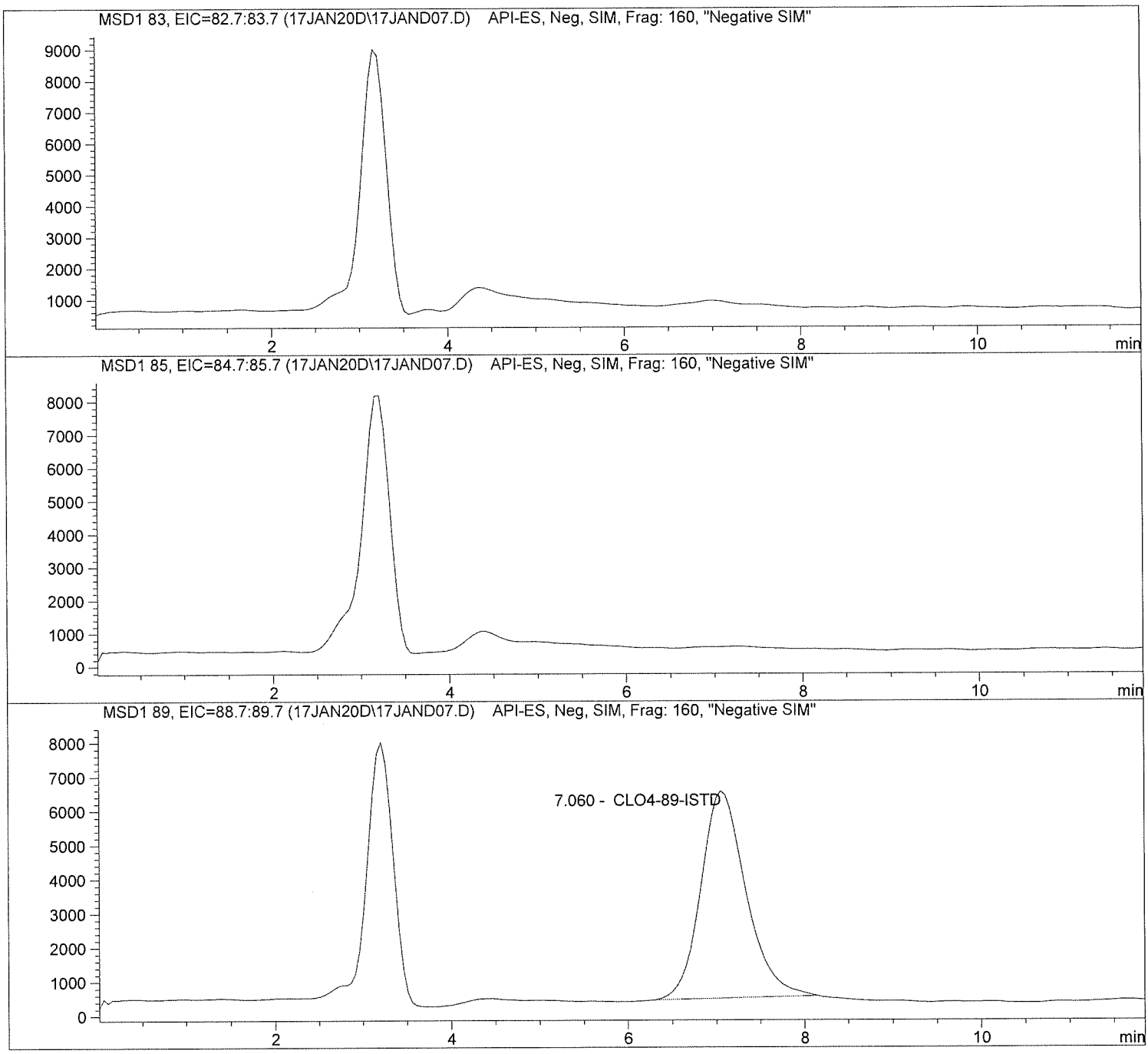
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND07.D Sample Name: 2004547001

Injection Date:	2/17/2020 10:11:50	Seq Line:	7
Sample Name:	2004547001	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: 2/17/2020 15:42:52

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND07.D Sample Name: 2004547001

Injection Date:	2/17/2020 10:11:50	Seq Line:	7
Sample Name:	2004547001	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: 2/17/2020 15:42:52

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	215048.0	5.0000	CLO4-89-ISTD

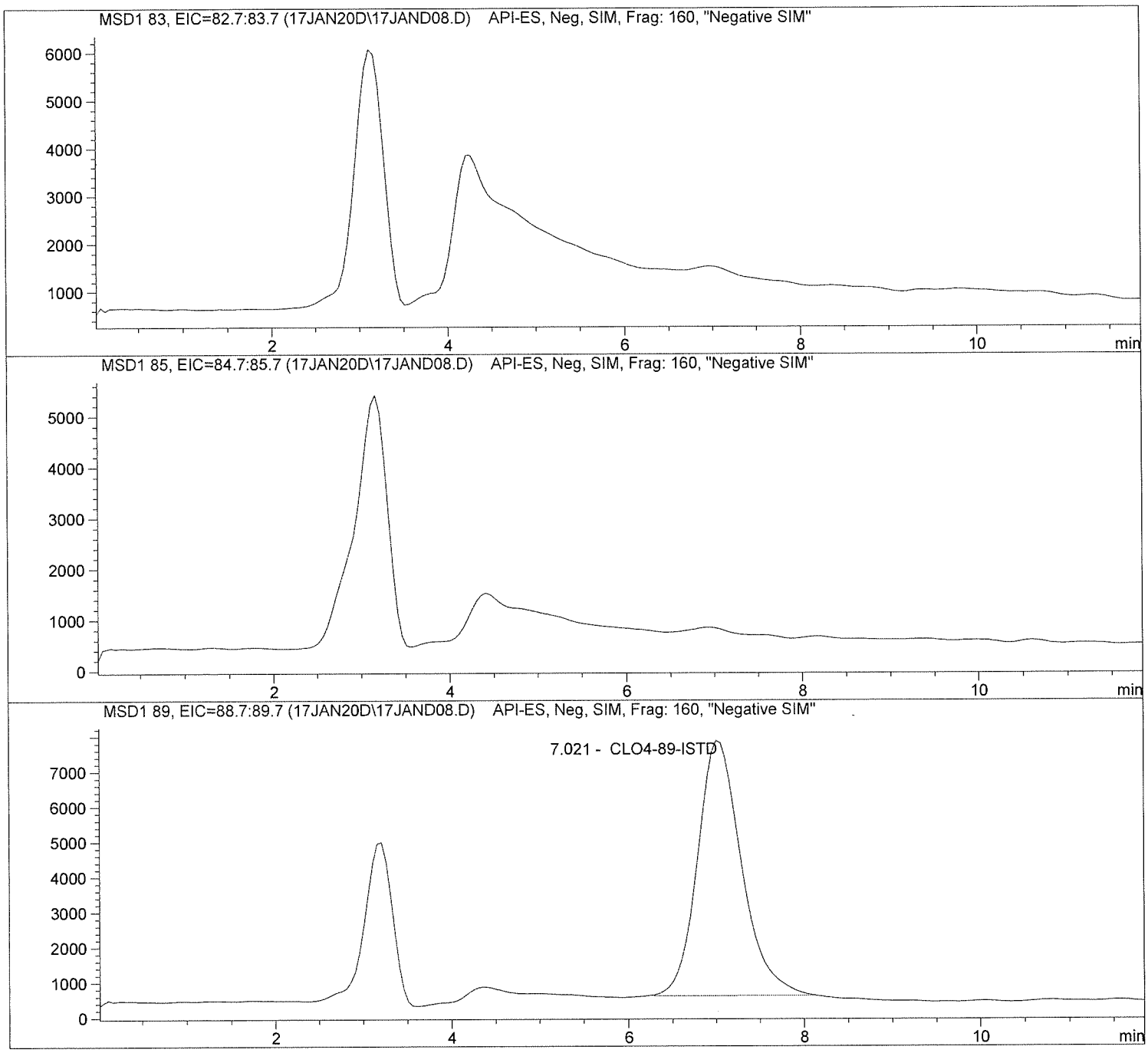
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND08.D Sample Name: 2004548001

Injection Date:	2/17/2020 10:25:44	Seq Line:	8
Sample Name:	2004548001	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: 2/17/2020 15:42:52

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND08.D Sample Name: 2004548001

Injection Date:	2/17/2020 10:25:44	Seq Line:	8
Sample Name:	2004548001	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:	2/17/2020 15:42:52

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
7.021	BBA	254205.5	5.0000	CLO4-89-ISTD

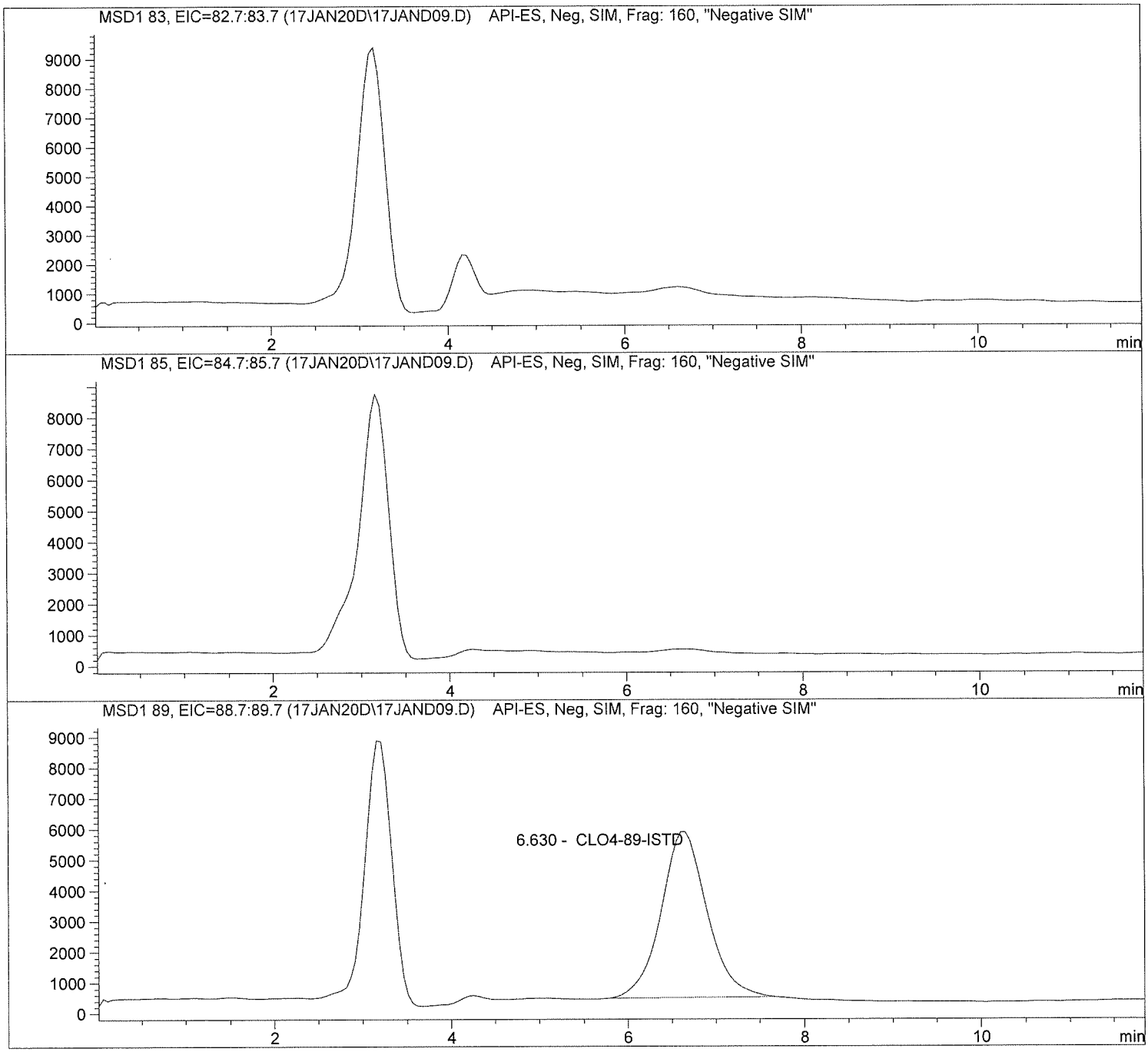
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND09.D Sample Name: 2004548002

Injection Date:	2/17/2020 10:39:36	Seq Line:	9
Sample Name:	2004548002	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: 2/17/2020 15:42:52

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND09.D Sample Name: 2004548002

Injection Date:	2/17/2020 10:39:36	Seq Line:	9
Sample Name:	2004548002	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:	2/17/2020 15:42:52

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
6.630	PBA	196394.8	5.0000	CLO4-89-ISTD

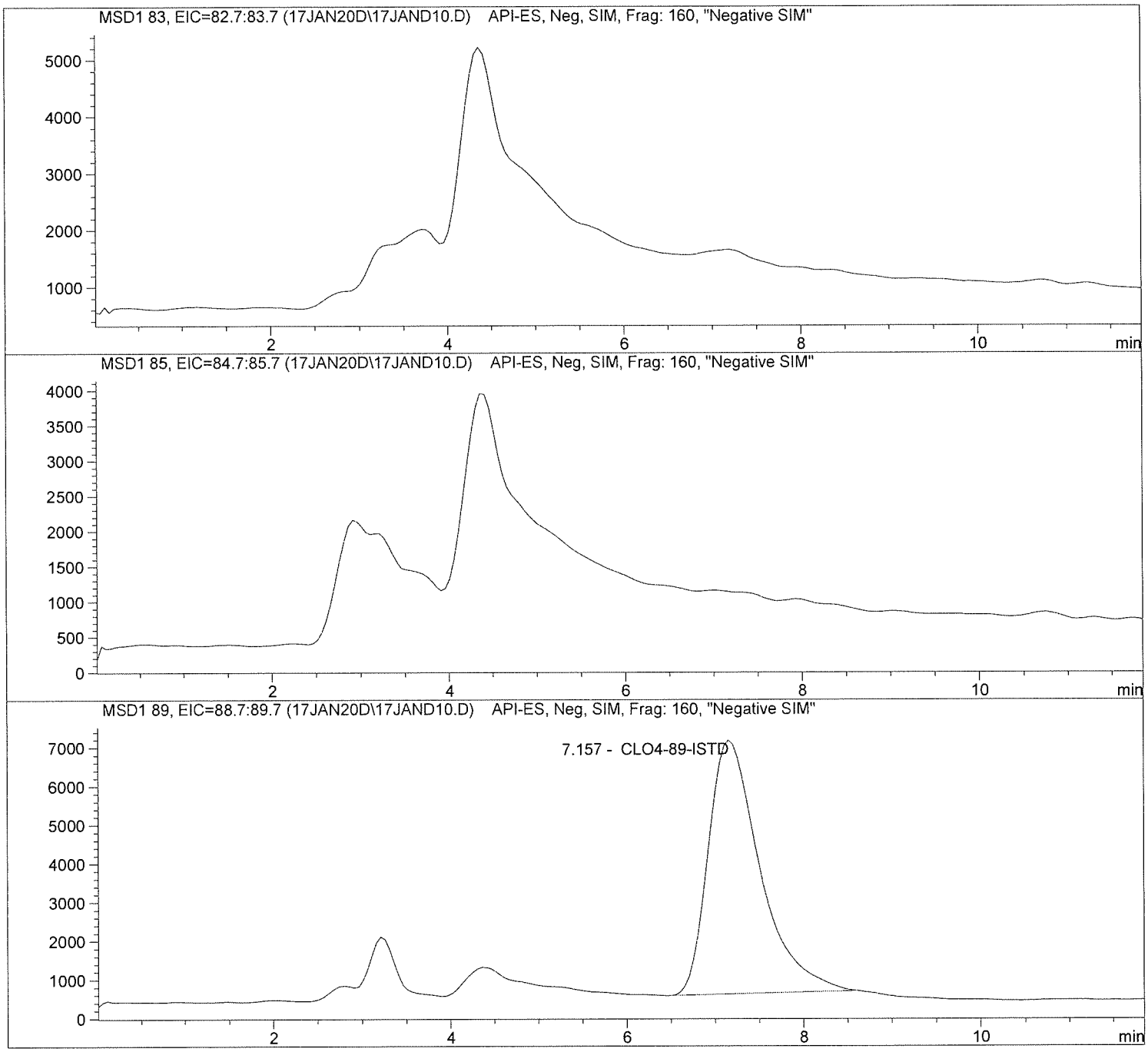
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND10.D Sample Name: 2004548003

Injection Date:	2/17/2020 10:53:30	Seq Line:	10
Sample Name:	2004548003	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: 2/17/2020 15:42:52

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND10.D Sample Name: 2004548003

Injection Date:	2/17/2020 10:53:30	Seq Line:	10
Sample Name:	2004548003	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: 2/17/2020 15:42:52

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
7.157	PBA	266482.4	5.0000	CLO4-89-ISTD

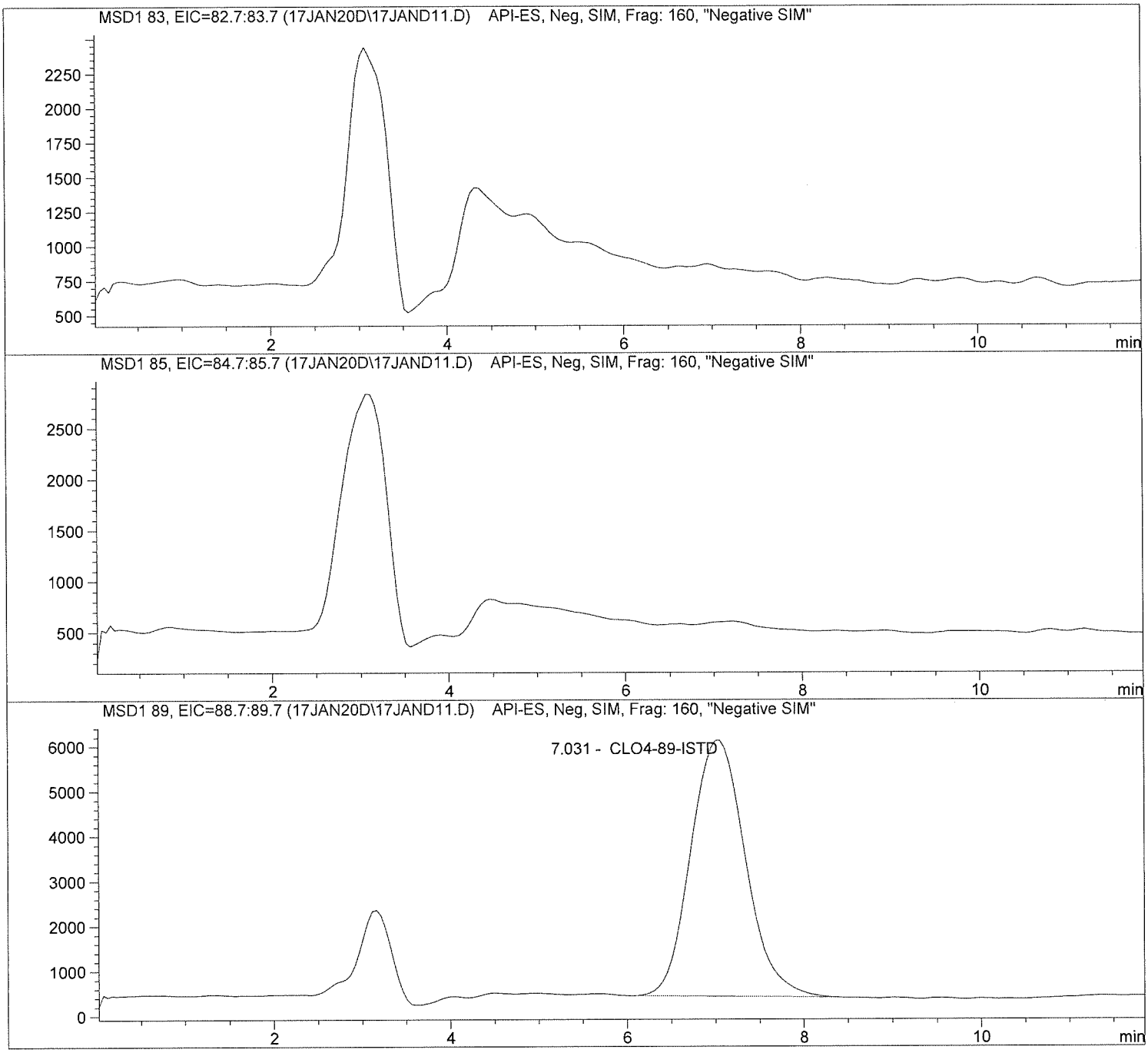
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND11.D Sample Name: 2004548004

Injection Date:	2/17/2020 11:07:22	Seq Line:	11
Sample Name:	2004548004	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: 2/17/2020 15:42:52

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND11.D Sample Name: 2004548004

Injection Date:	2/17/2020 11:07:22	Seq Line:	11
Sample Name:	2004548004	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:	2/17/2020 15:42:52

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
7.031	PBA	245153.6	5.0000	CLO4-89-ISTD

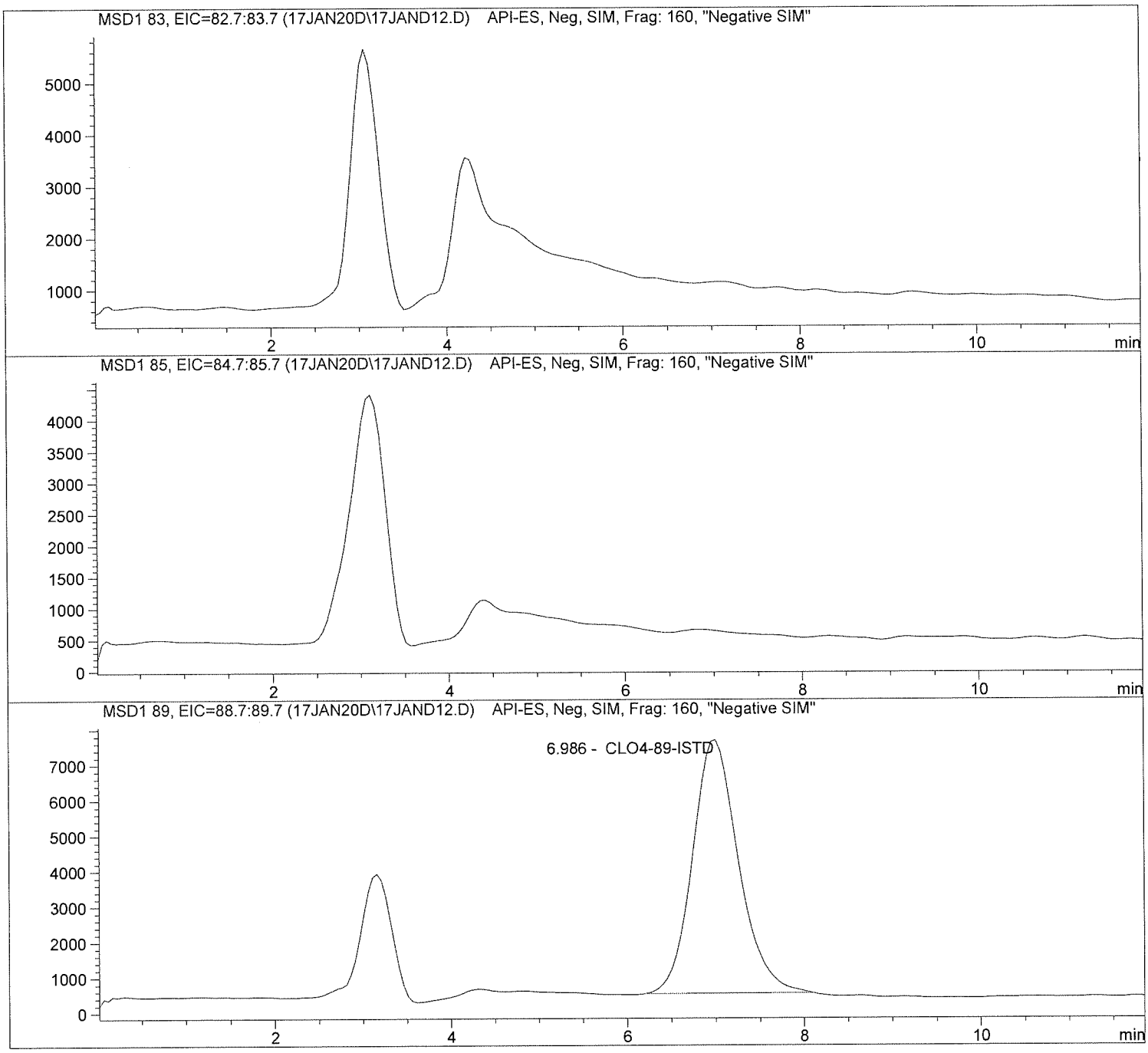
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND12.D Sample Name: 2004548005

Injection Date:	2/17/2020 11:21:13	Seq Line:	12
Sample Name:	2004548005	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: 2/17/2020 15:42:52

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND12.D Sample Name: 2004548005

Injection Date:	2/17/2020 11:21:13	Seq Line:	12
Sample Name:	2004548005	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:	2/17/2020 15:42:52

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
6.986	PBA	258211.1	5.0000	CLO4-89-ISTD

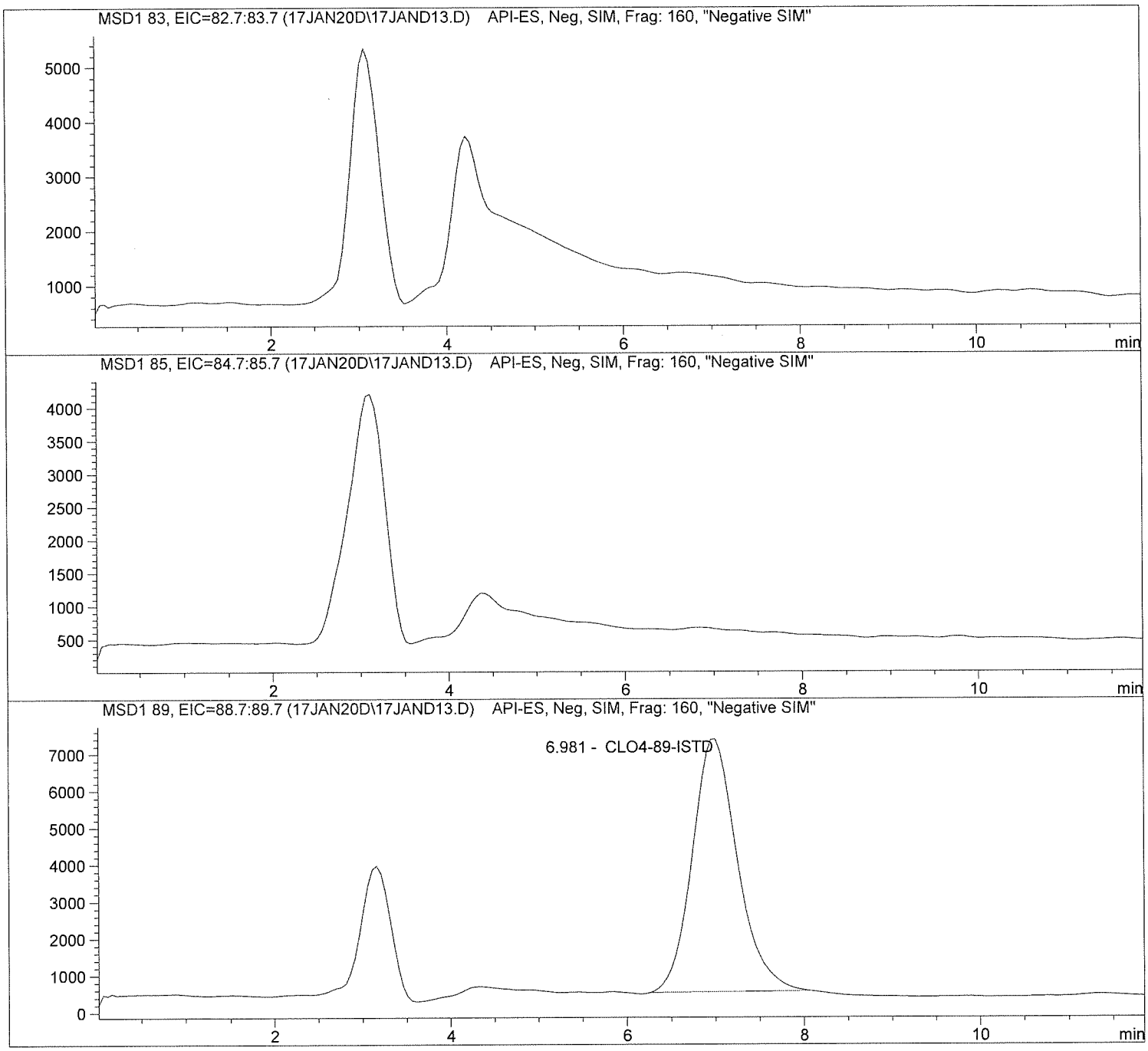
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND13.D Sample Name: 2004548006

Injection Date:	2/17/2020 11:35:03	Seq Line:	13
Sample Name:	2004548006	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: 2/17/2020 15:42:52

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND13.D Sample Name: 2004548006

Injection Date:	2/17/2020 11:35:03	Seq Line:	13
Sample Name:	2004548006	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:	2/17/2020 15:42:52

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
6.981	PBA	244278.8	5.0000	CLO4-89-ISTD

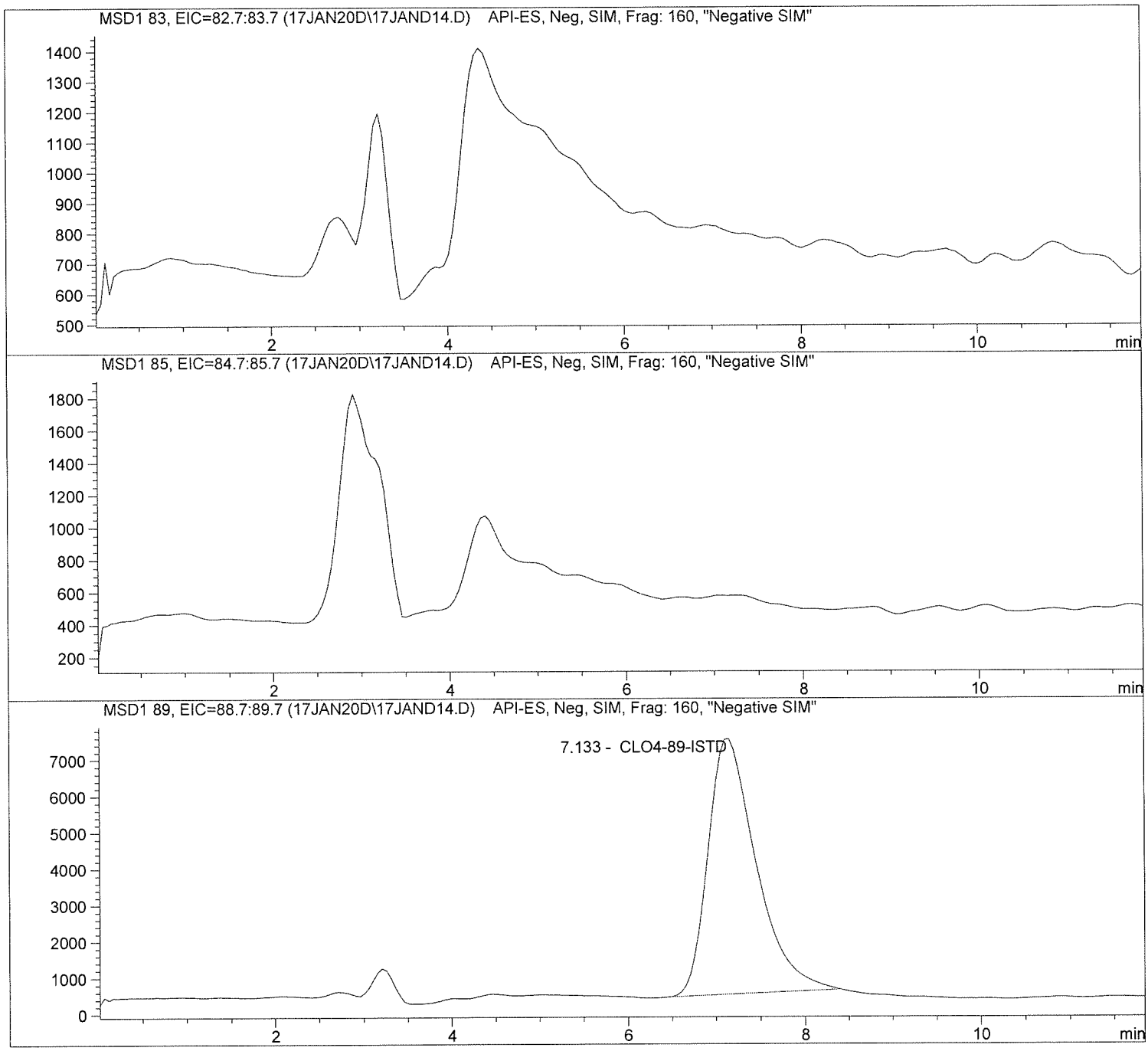
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND14.D Sample Name: 2004548007

Injection Date:	2/17/2020 11:49:00	Seq Line:	14
Sample Name:	2004548007	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: 2/17/2020 15:42:52

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND14.D Sample Name: 2004548007

Injection Date:	2/17/2020 11:49:00	Seq Line:	14
Sample Name:	2004548007	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: 2/17/2020 15:42:52

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
7.133	PBA	265819.8	5.0000	CLO4-89-ISTD

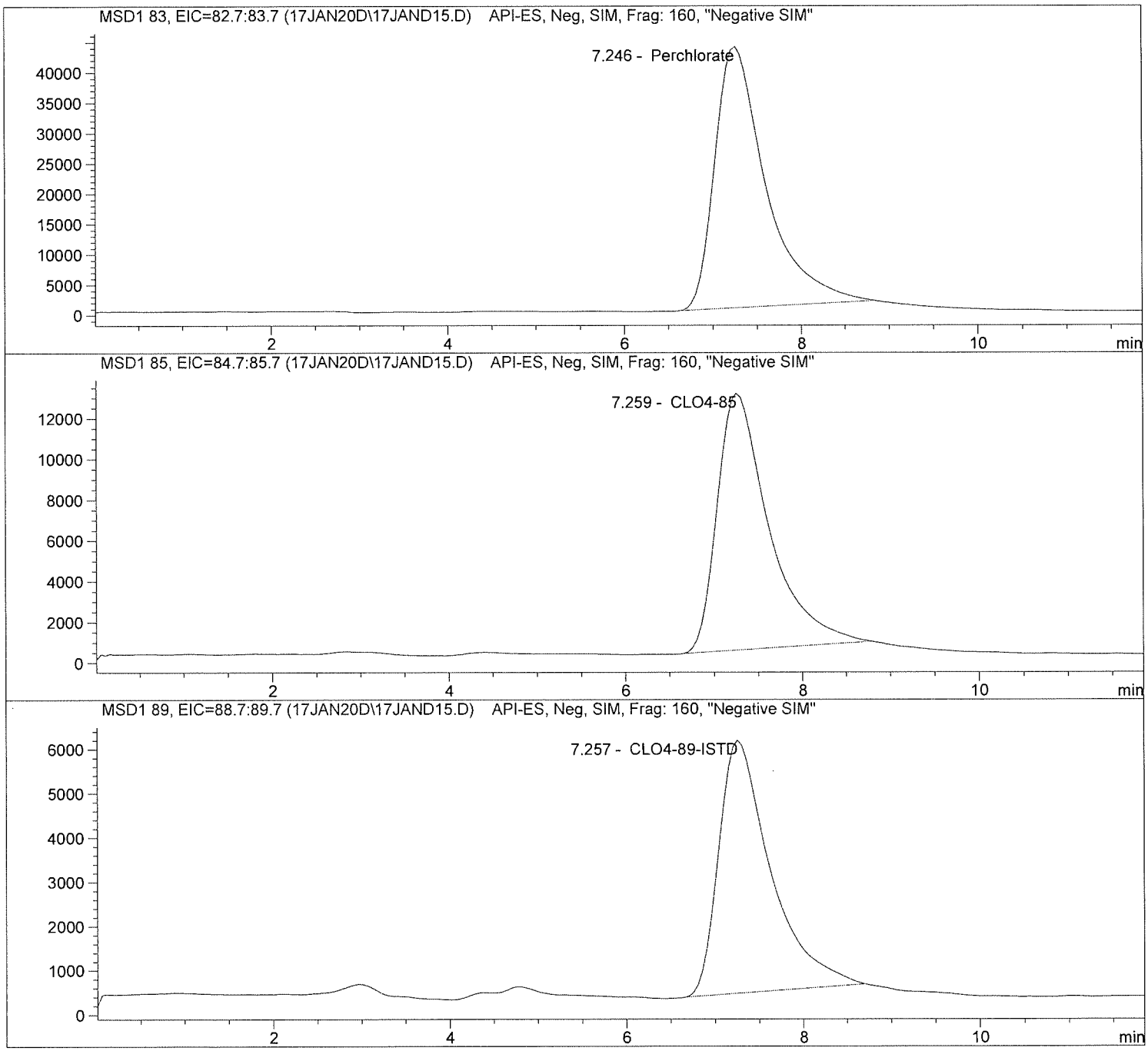
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND15.D Sample Name: 695967 CCV@25

Injection Date:	2/17/2020 12:02:52	Seq Line:	15
Sample Name:	695967 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: 2/17/2020 15:42:52

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND15.D Sample Name: 695967 CCV@25

Injection Date:	2/17/2020 12:02:52	Seq Line:	15
Sample Name:	695967 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: 2/17/2020 15:42:52

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
7.246	PBA	1729590.0	25.2642	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.259	PBA	512272.7	24.6022	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.257	PBA	233667.8	5.0000	CLO4-89-ISTD

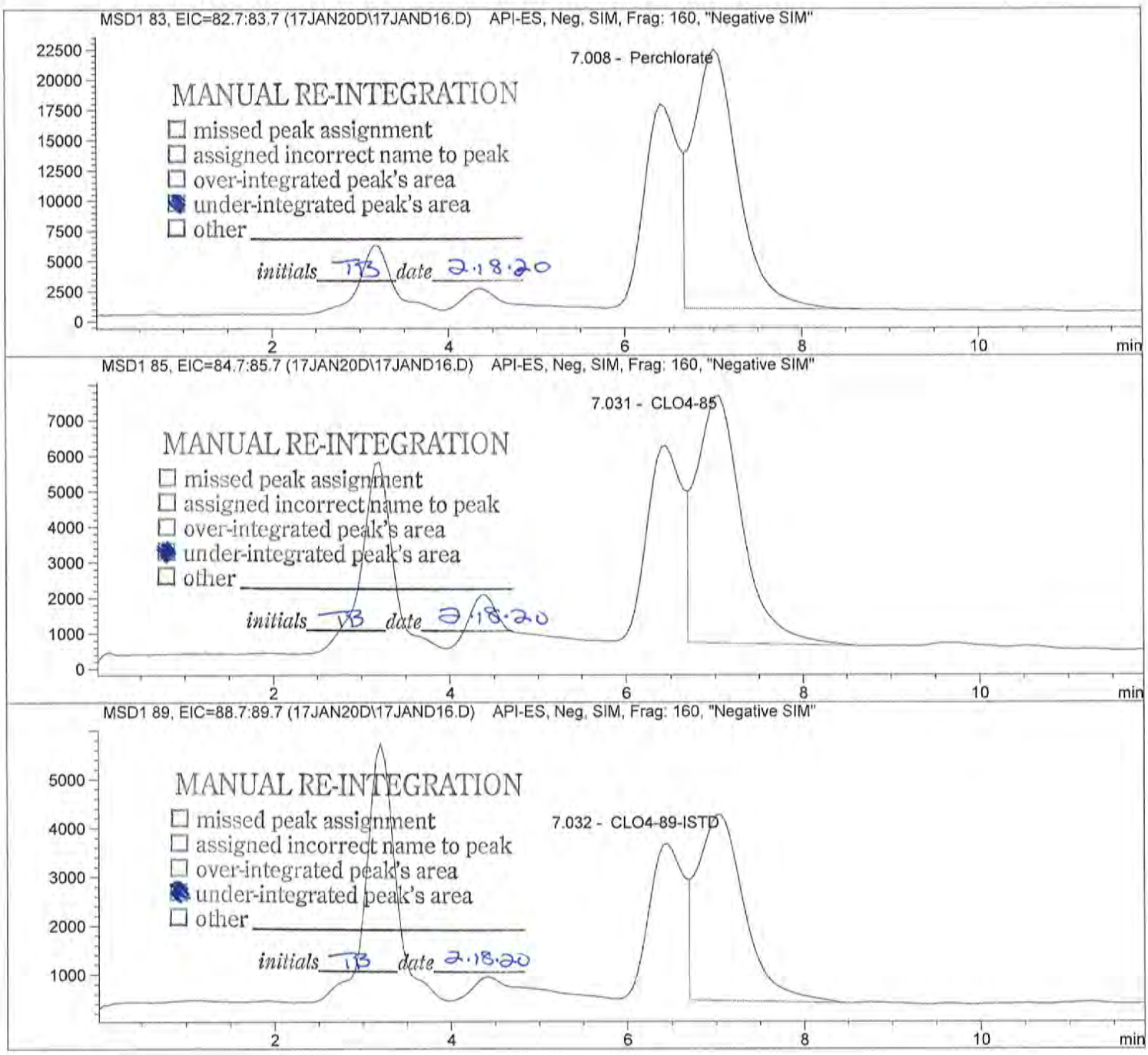
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND16.D Sample Name: 2004548008

Injection Date:	2/17/2020 12:16:47	Seq Line:	16
Sample Name:	2004548008	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: 2/17/2020 15:42:52

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND16.D Sample Name: 2004548008

Injection Date:	2/17/2020 12:16:47	Seq Line:	16
Sample Name:	2004548008	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: 2/17/2020 15:42:52

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
7.008	FM	748879.1	18.9784	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.031	FM	246750.5	20.3501	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.032	FM	138229.9	5.0000	CLO4-89-ISTD

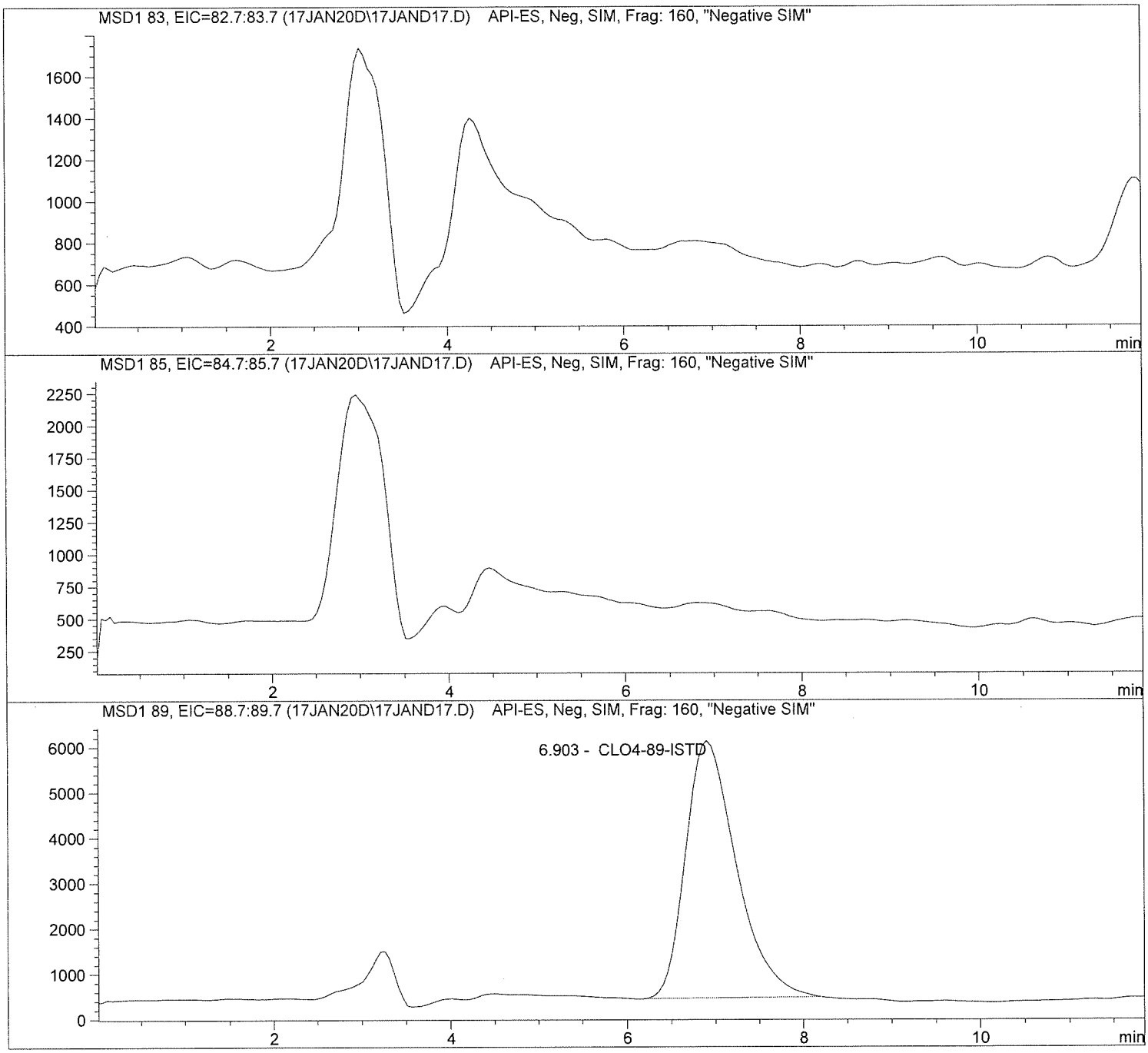
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND17.D Sample Name: 2004548009

Injection Date:	2/17/2020 12:30:39	Seq Line:	17
Sample Name:	2004548009	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: 2/17/2020 15:42:52

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND17.D Sample Name: 2004548009

Injection Date:	2/17/2020 12:30:39	Seq Line:	17
Sample Name:	2004548009	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: 2/17/2020 15:42:52

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
6.903	PBA	227261.6	5.0000	CLO4-89-ISTD

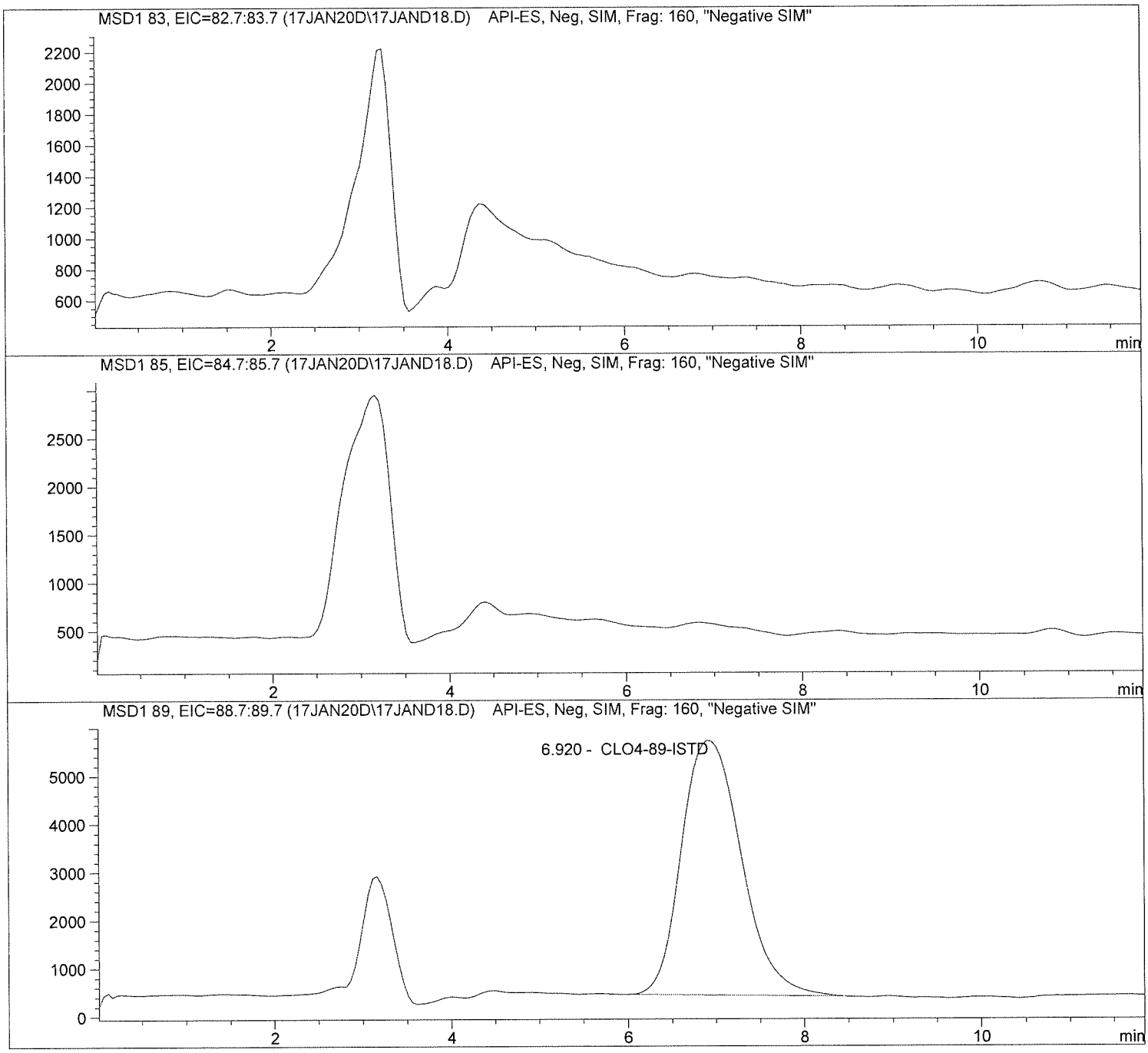
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND18.D Sample Name: 2004548010

Injection Date:	2/17/2020 12:44:31	Seq Line:	18
Sample Name:	2004548010	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: 2/17/2020 15:42:52

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND18.D Sample Name: 2004548010

Injection Date:	2/17/2020 12:44:31	Seq Line:	18
Sample Name:	2004548010	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: 2/17/2020 15:42:52

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
6.920	PBA	250414.9	5.0000	CLO4-89-ISTD

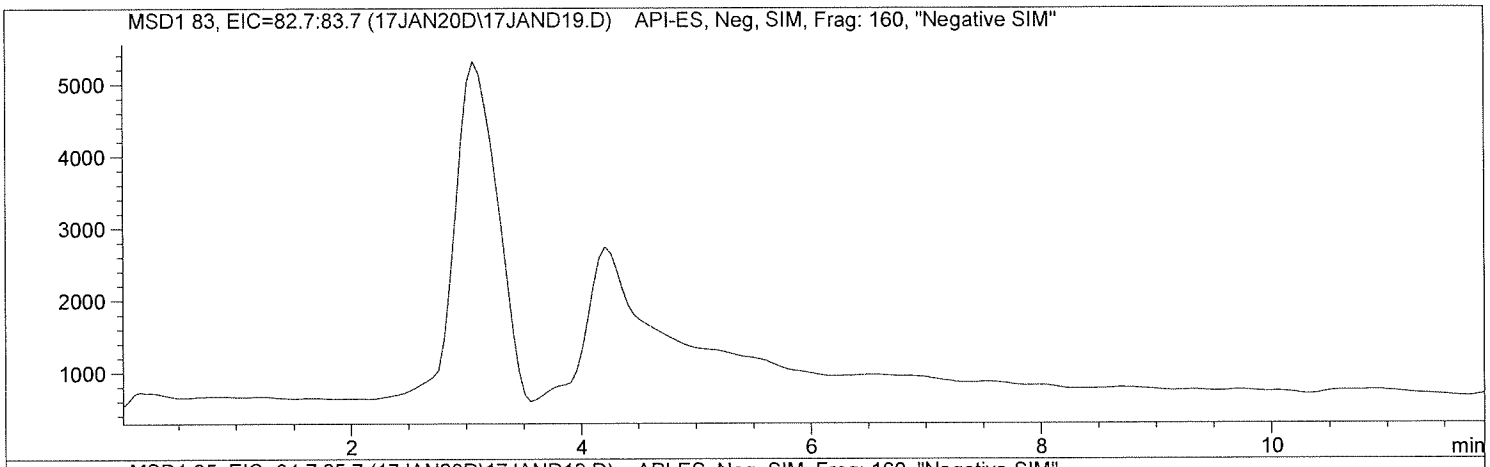
*** End of Report ***

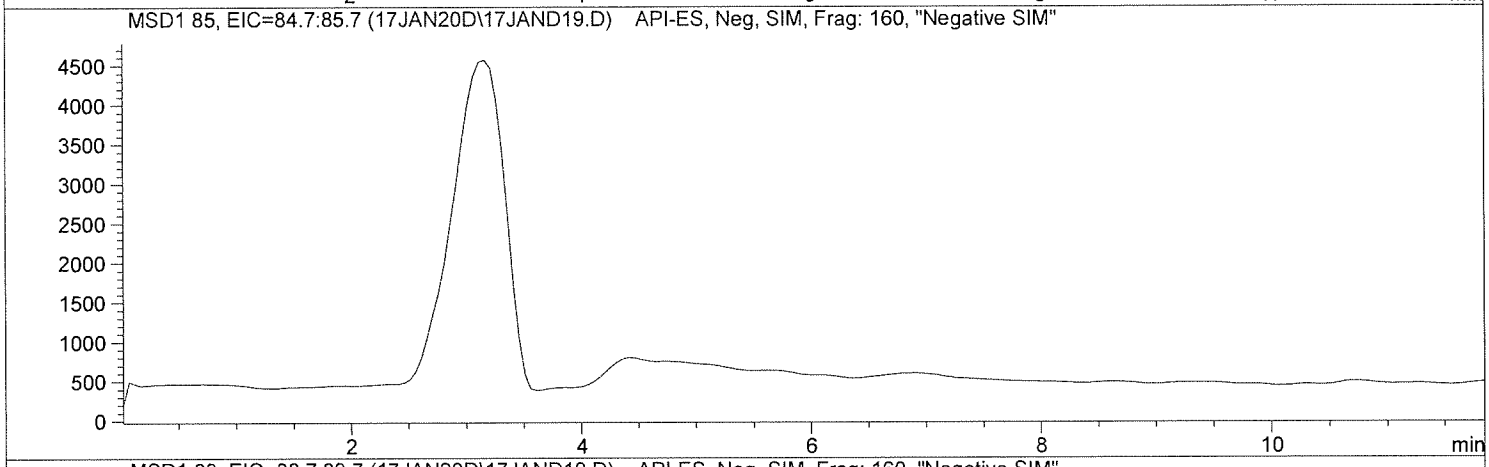
Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND19.D Sample Name: 2004548011

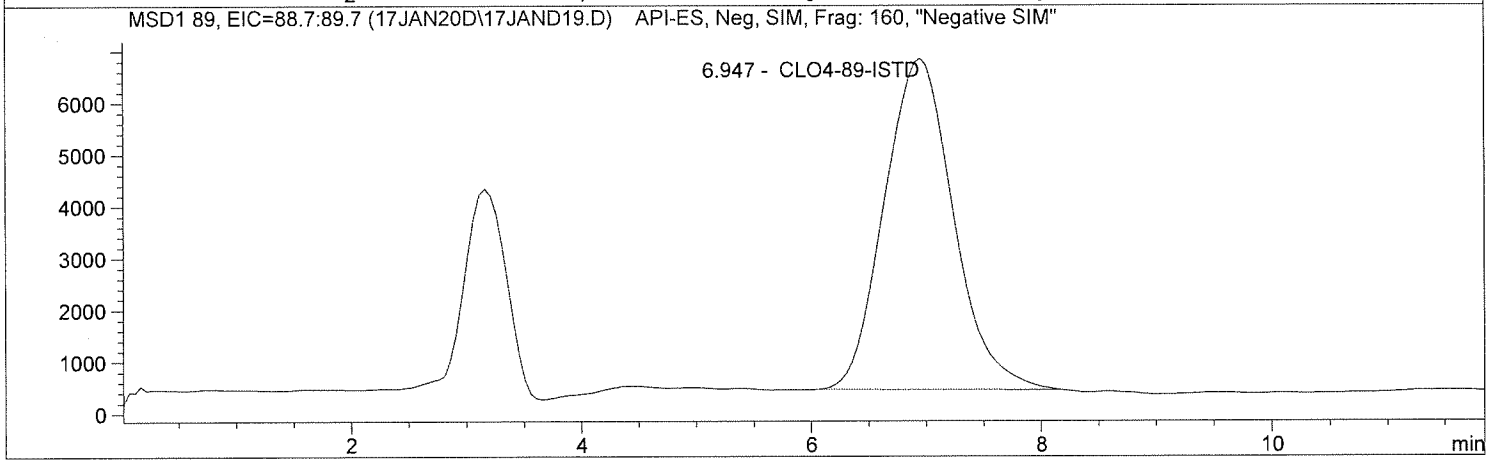
Injection Date:	2/17/2020 12:58:22	Seq Line:	19
Sample Name:	2004548011	Location:	Vial 88
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 2/17/2020 15:42:52

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND19.D Sample Name: 2004548011

Injection Date:	2/17/2020 12:58:22	Seq Line:	19
Sample Name:	2004548011	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: 2/17/2020 15:42:52

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
6.947	PBA	267411.8	5.0000	CLO4-89-ISTD

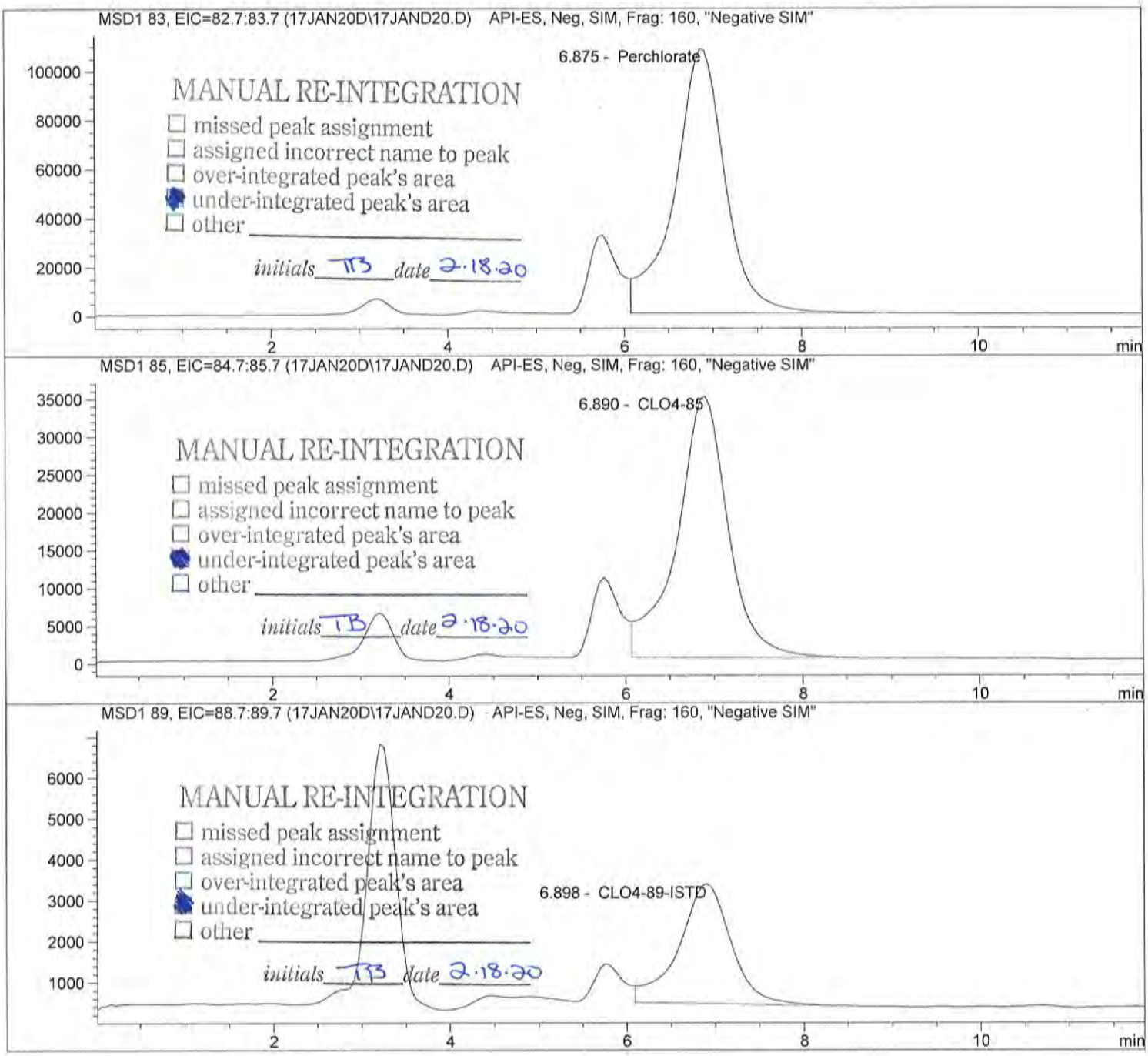
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND20.D Sample Name: 2004548012

Injection Date:	2/17/2020 13:12:19	Seq Line:	20
Sample Name:	2004548012	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: 2/17/2020 15:42:52

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND20.D Sample Name: 2004548012

Injection Date:	2/17/2020 13:12:19	Seq Line:	20
Sample Name:	2004548012	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: 2/17/2020 15:42:52

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
6.875	FM	4277198.5	94.6505	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.890	FM	1382737.4	100.2794	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.898	FM	119387.1	5.0000	CLO4-89-ISTD

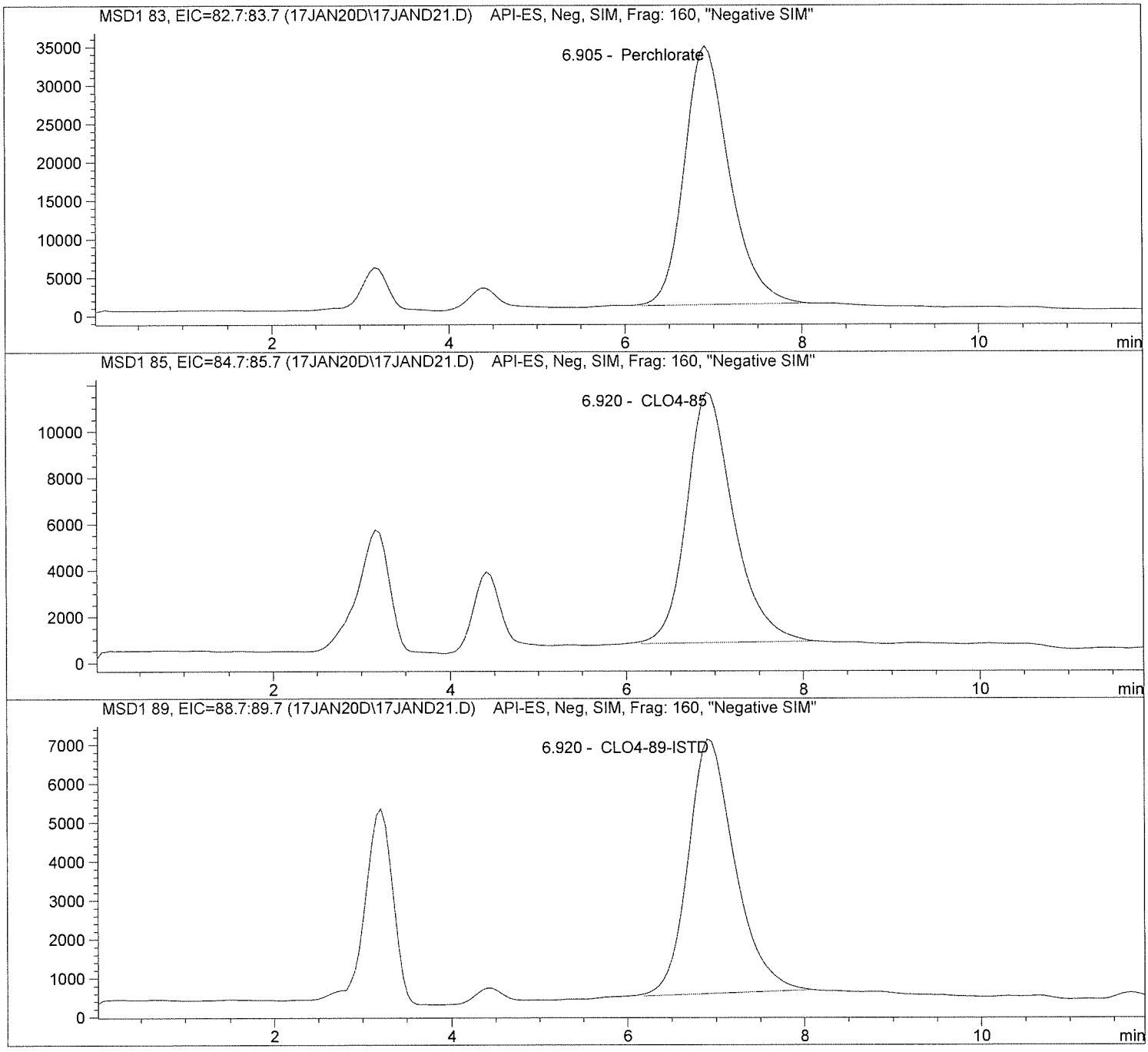
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND21.D Sample Name: 2004548013

Injection Date:	2/17/2020 13:26:12	Seq Line:	21
Sample Name:	2004548013	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: 2/17/2020 15:42:52

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND21.D Sample Name: 2004548013

Injection Date:	2/17/2020 13:26:12	Seq Line:	21
Sample Name:	2004548013	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: 2/17/2020 15:42:52

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
6.905	BBA	1185693.1	17.5126	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.920	BBA	397137.3	19.0629	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.920	BBA	238618.0	5.0000	CLO4-89-ISTD

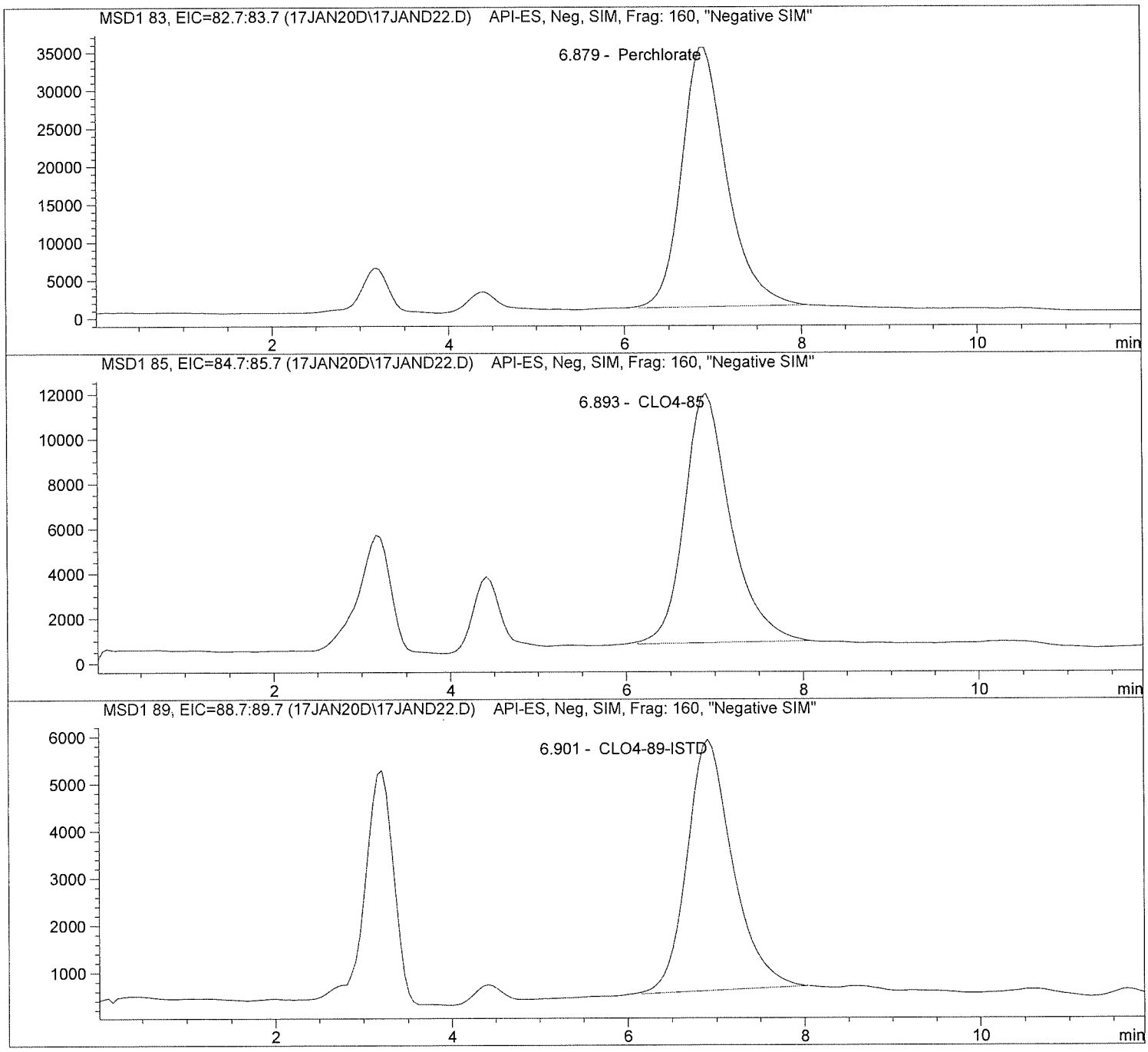
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND22.D Sample Name: 2004548014

Injection Date:	2/17/2020 13:40:06	Seq Line:	22
Sample Name:	2004548014	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: 2/17/2020 15:42:52

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND22.D Sample Name: 2004548014

Injection Date:	2/17/2020 13:40:06	Seq Line:	22
Sample Name:	2004548014	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: 2/17/2020 15:42:52

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
6.879	BBA	1208615.6	21.8897	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.893	BBA	402089.2	23.6919	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.901	BBA	191102.0	5.0000	CLO4-89-ISTD

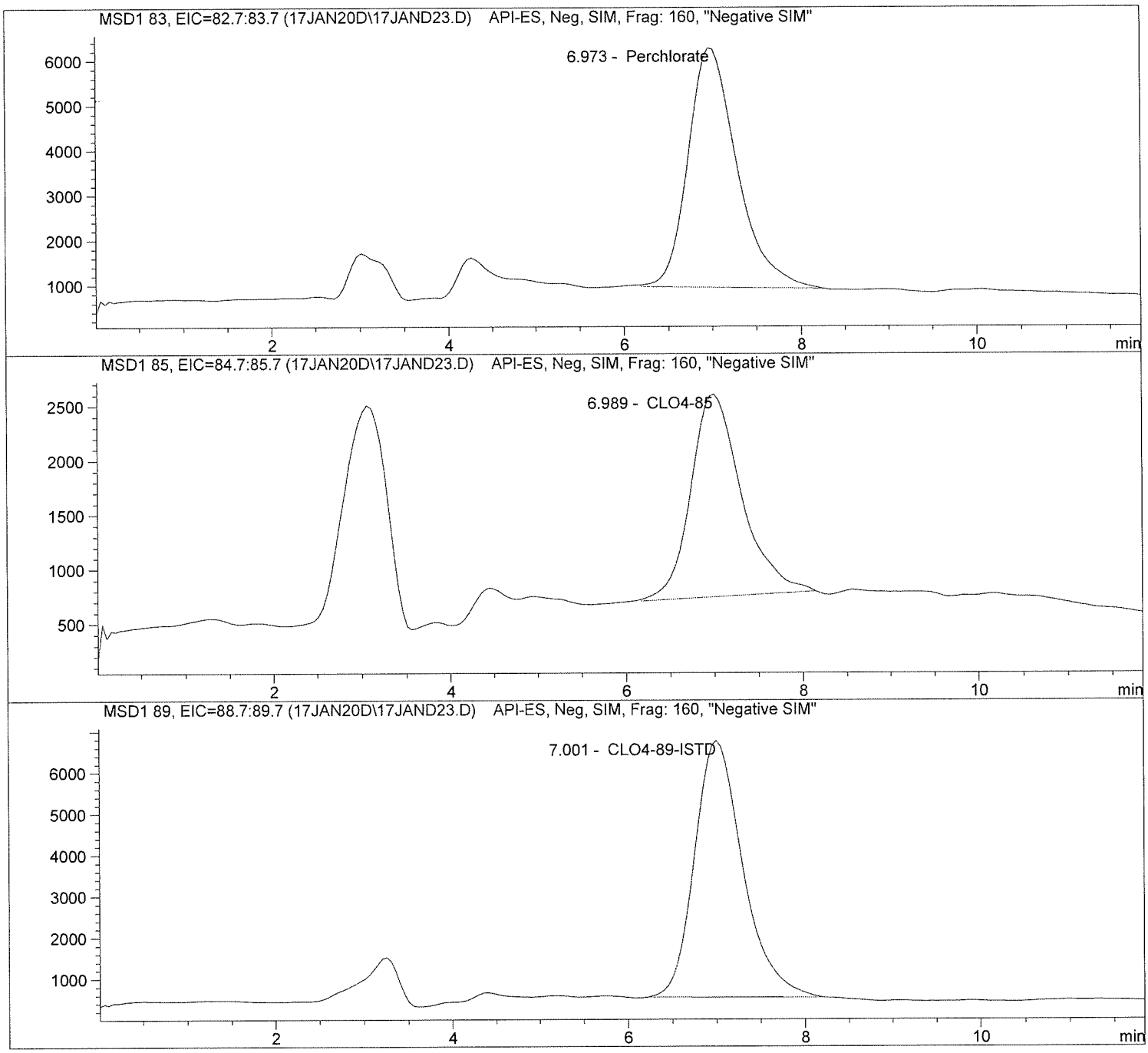
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND23.D Sample Name: 2004548015 MS

Injection Date:	2/17/2020 14:54:53	Seq Line:	23
Sample Name:	2004548015 MS	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: 2/17/2020 15:42:52

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND23.D Sample Name: 2004548015 MS

Injection Date:	2/17/2020 14:54:53	Seq Line:	23
Sample Name:	2004548015 MS	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:	2/17/2020 15:42:52

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	BBA	205914.9	3.1969	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.989	BBA	74577.8	3.7093	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.001	PBA	237178.4	5.0000	CLO4-89-ISTD

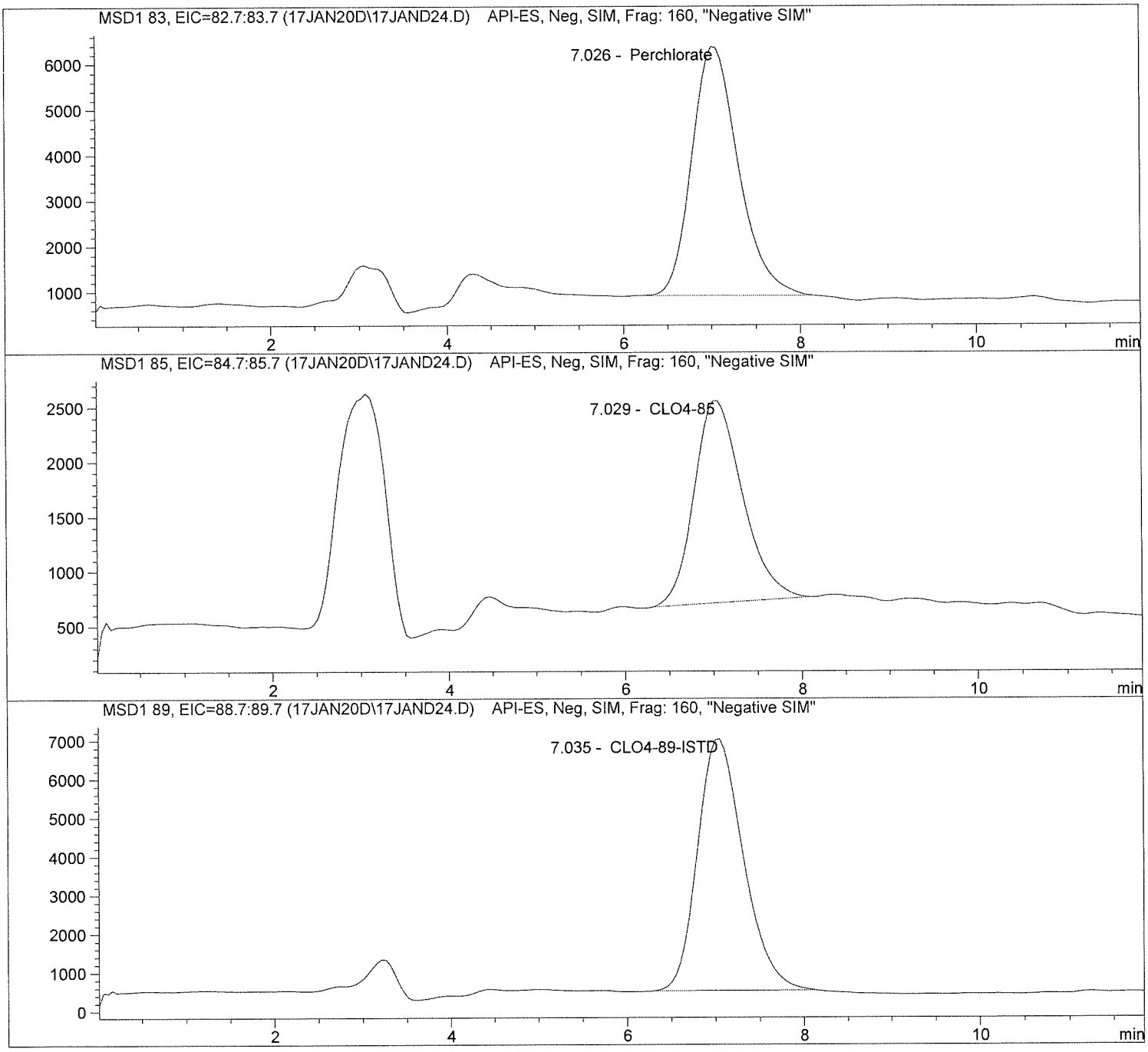
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND24.D Sample Name: 2004548016 MSD

Injection Date:	2/17/2020 15:08:46	Seq Line:	24
Sample Name:	2004548016 MSD	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: 2/17/2020 15:42:52

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND24.D Sample Name: 2004548016 MSD

Injection Date:	2/17/2020 15:08:46	Seq Line:	24
Sample Name:	2004548016 MSD	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: 2/17/2020 15:42:52

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
7.026	BBA	199352.0	3.1385	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.029	PBA	70132.0	3.5331	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.035	PBA	233840.1	5.0000	CLO4-89-ISTD

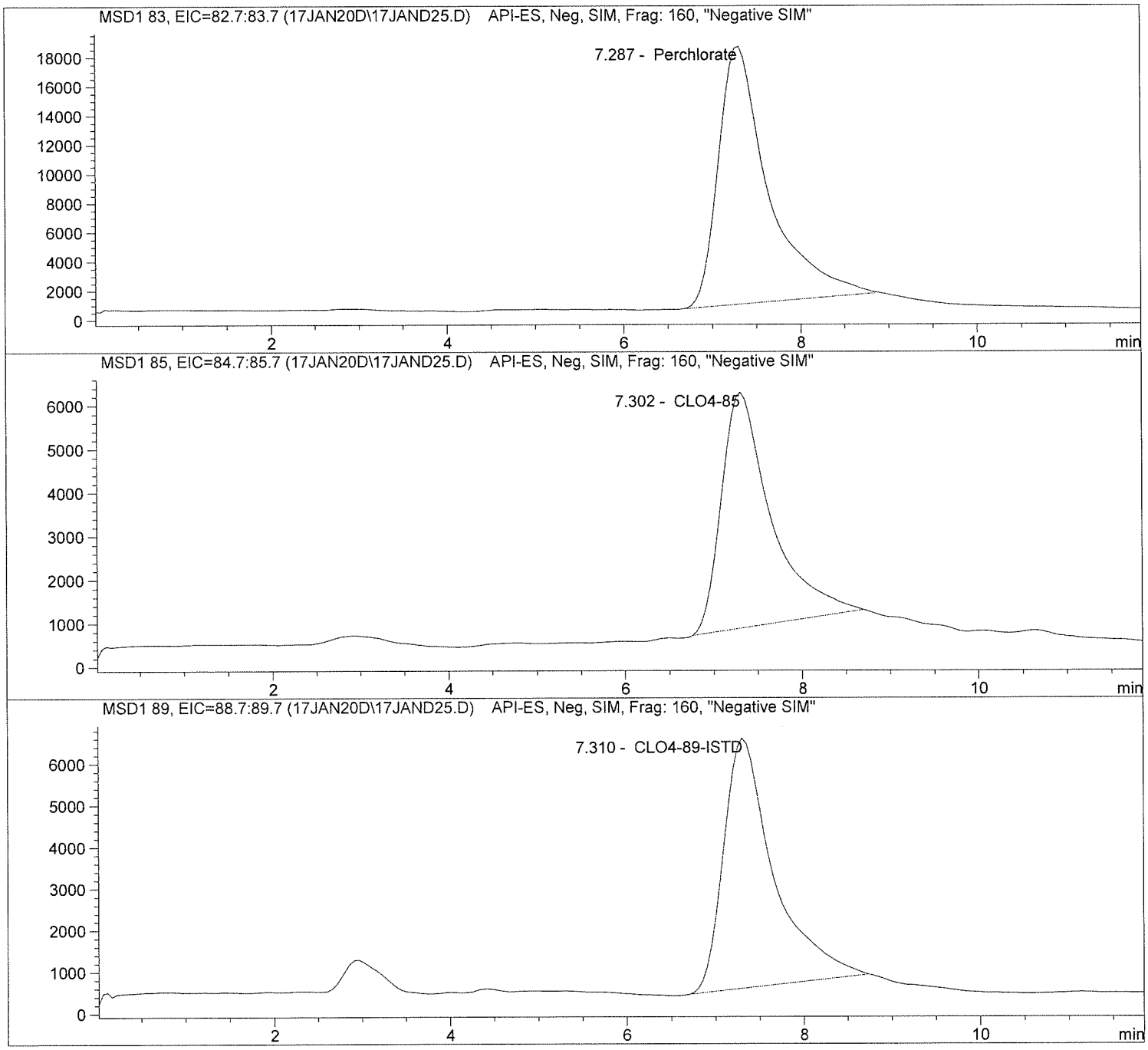
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND25.D Sample Name: 2004545001 1K

Injection Date:	2/17/2020 15:22:38	Seq Line:	25
Sample Name:	2004545001 1K	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: 2/17/2020 15:42:52

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND25.D Sample Name: 2004545001 1K

Injection Date:	2/17/2020 15:22:38	Seq Line:	25
Sample Name:	2004545001 1K	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: 2/17/2020 15:42:52

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
7.287	PBA	698274.0	10634.7156	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.302	PBA	211342.7	10471.5946	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.310	PBA	237890.8	5000.0000	CLO4-89-ISTD

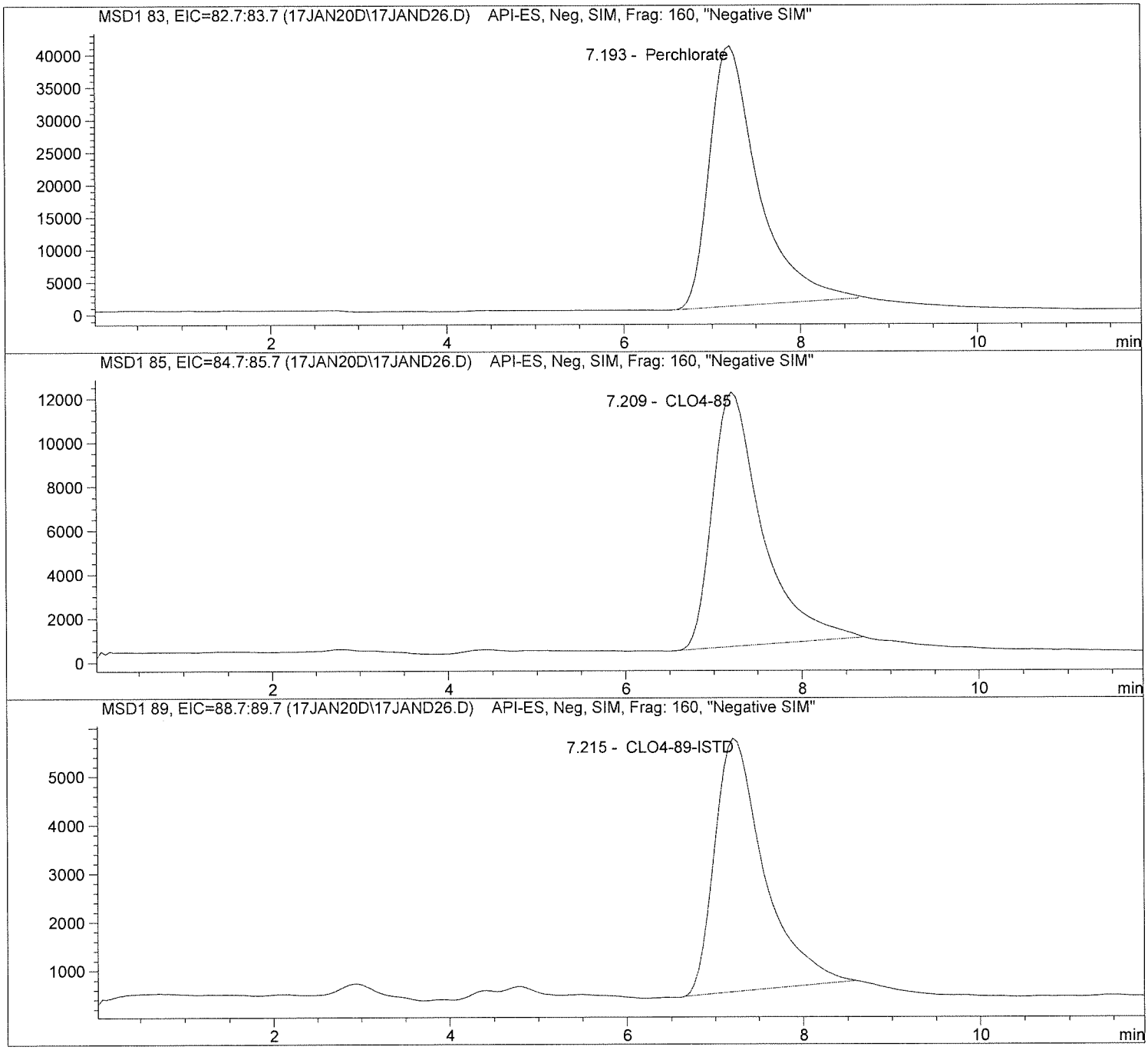
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND26.D Sample Name: 695968 CCV@25

Injection Date:	2/17/2020 15:36:30	Seq Line:	26
Sample Name:	695968 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: 2/17/2020 15:42:52

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND26.D Sample Name: 695968 CCV@25

Injection Date:	2/17/2020 15:36:30	Seq Line:	26
Sample Name:	695968 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: 2/17/2020 15:42:52

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
7.193	PBA	1543213.8	25.7523	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.209	PBA	453507.4	24.9041	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.215	PBA	204125.2	5.0000	CLO4-89-ISTD

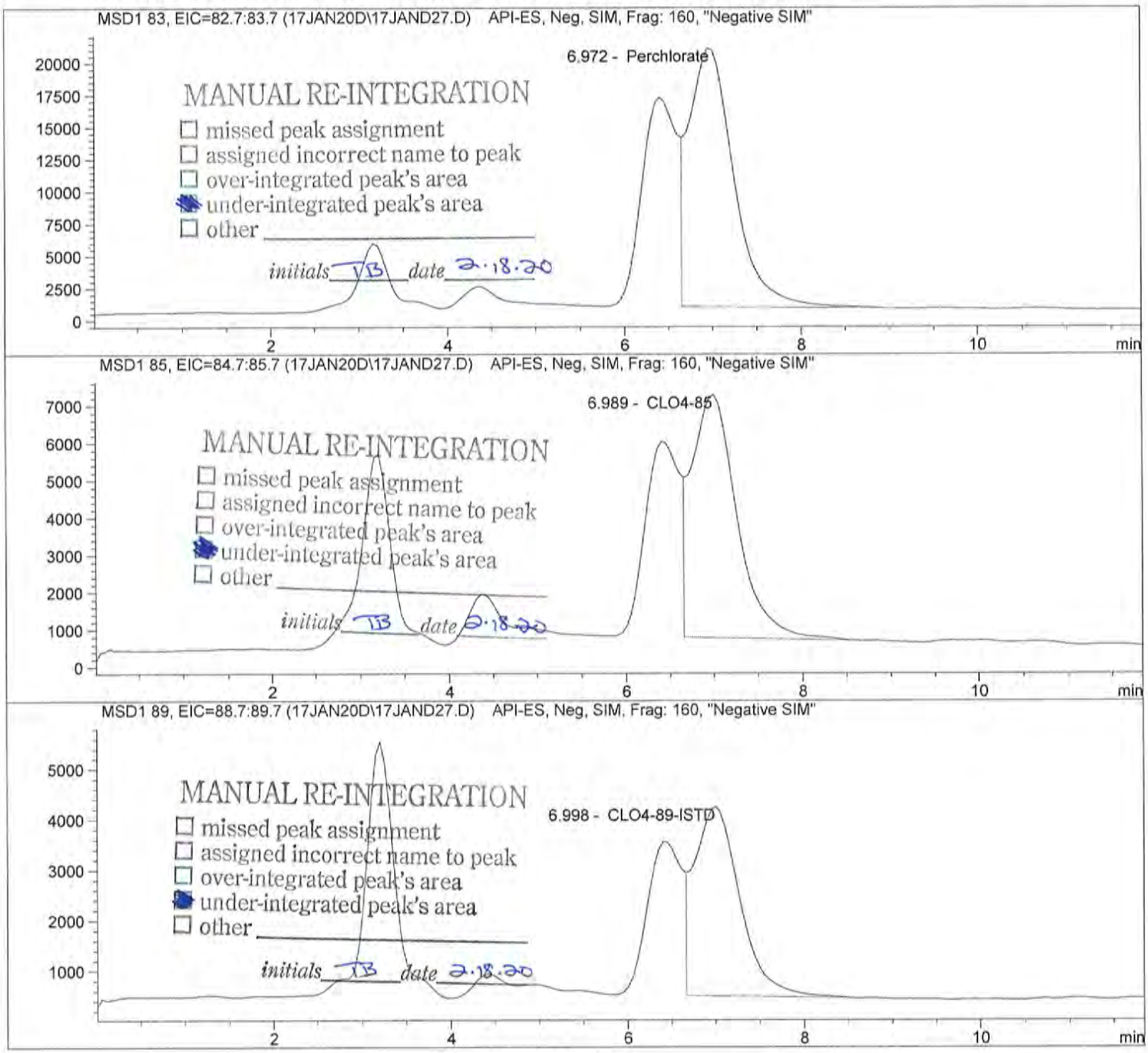
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND27.D Sample Name: 2004548008 RE

Injection Date:	2/17/2020 15:50:22	Seq Line:	27
Sample Name:	2004548008 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: 2/17/2020 15:42:52

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND27.D Sample Name: 2004548008 RE

Injection Date:	2/17/2020 15:50:22	Seq Line:	27
Sample Name:	2004548008 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:	2/17/2020 15:42:52

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
6.972	FM	697531.6	18.6067	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.989	FM	226846.6	19.7083	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.998	FM	131526.5	5.0000	CLO4-89-ISTD

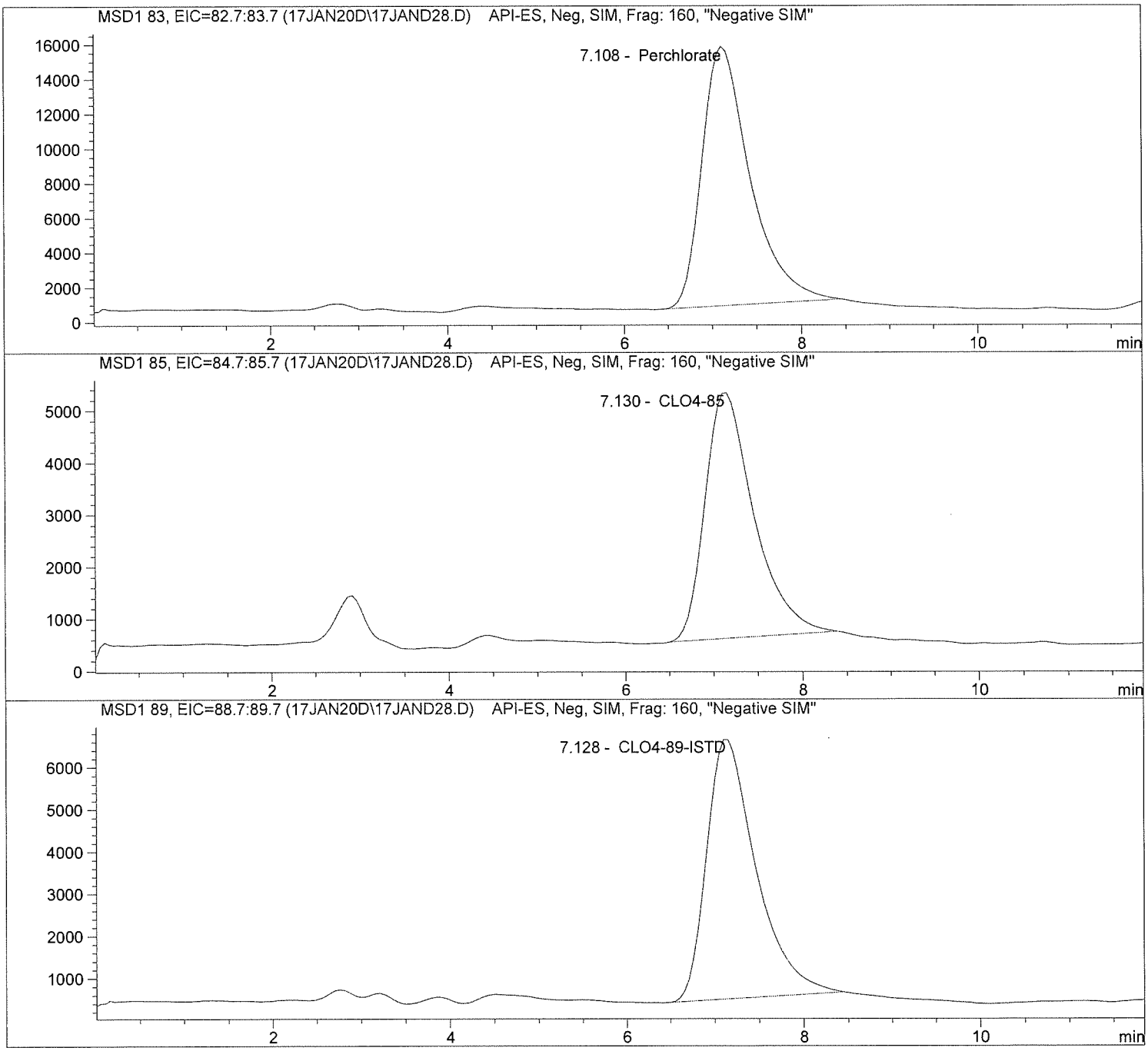
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND28.D Sample Name: 2004548012 10X

Injection Date:	2/17/2020 16:04:15	Seq Line:	28
Sample Name:	2004548012 10X	Location:	Vial 95
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 2/17/2020 15:42:52

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND28.D Sample Name: 2004548012 10X

Injection Date:	2/17/2020 16:04:15	Seq Line:	28
Sample Name:	2004548012 10X	Location:	Vial 95
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 2/17/2020 15:42:52

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: MSDl 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.108	PBA	564189.9	86.4519	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.130	PBA	180716.6	89.7731	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.128	PBA	238166.1	50.0000	CLO4-89-ISTD

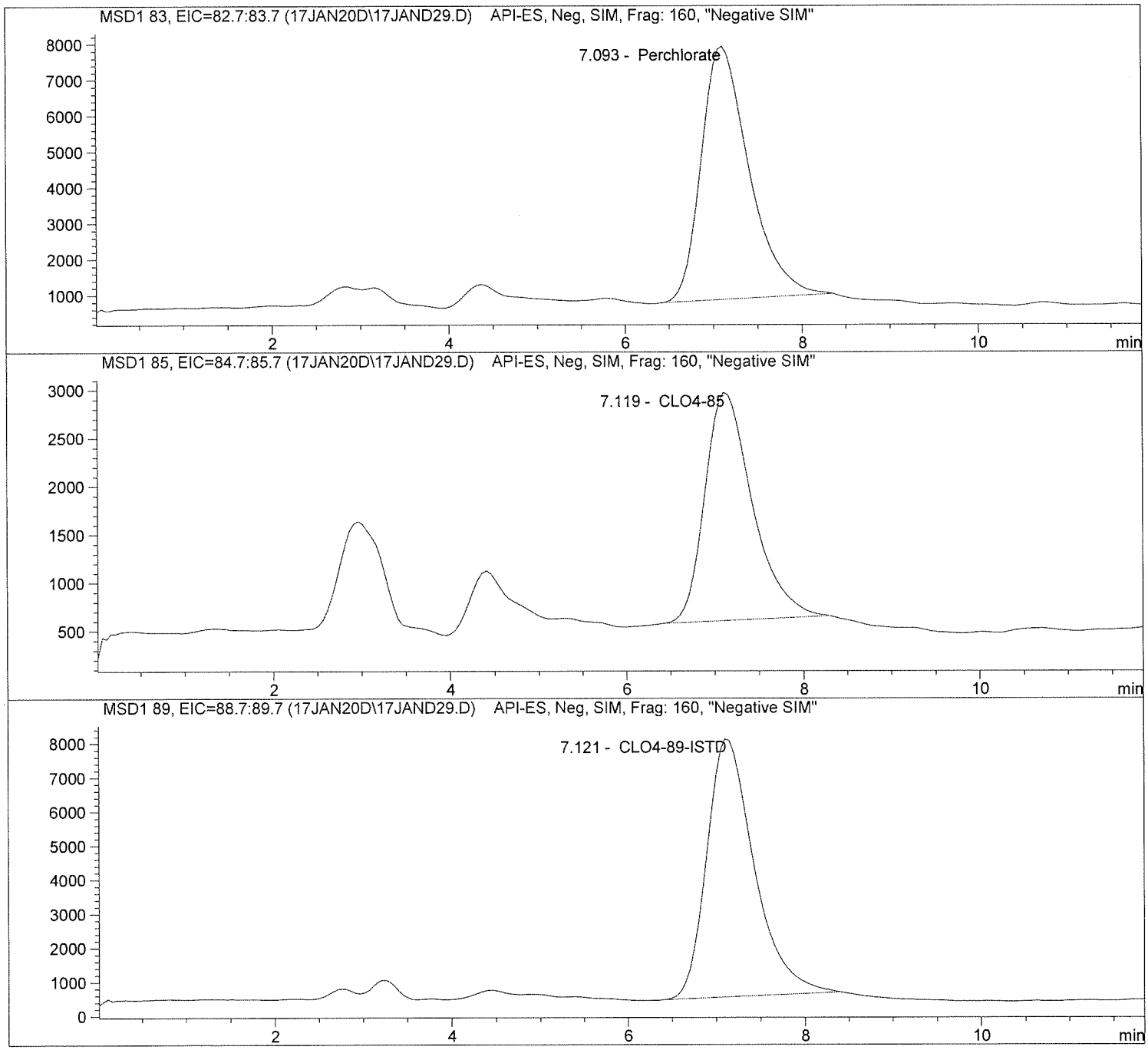
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND29.D Sample Name: 2004548008 5X

Injection Date:	2/17/2020 16:20:33	Seq Line:	29
Sample Name:	2004548008 5X	Location:	Vial 96
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 2/17/2020 15:42:52

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND29.D Sample Name: 2004548008 5X

Injection Date:	2/17/2020 16:20:33	Seq Line:	29
Sample Name:	2004548008 5X	Location:	Vial 96
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 2/17/2020 15:42:52

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
7.093	PBA	264236.7	17.2945	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.119	BBA	88185.4	18.4759	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.121	PBA	281500.3	25.0000	CLO4-89-ISTD

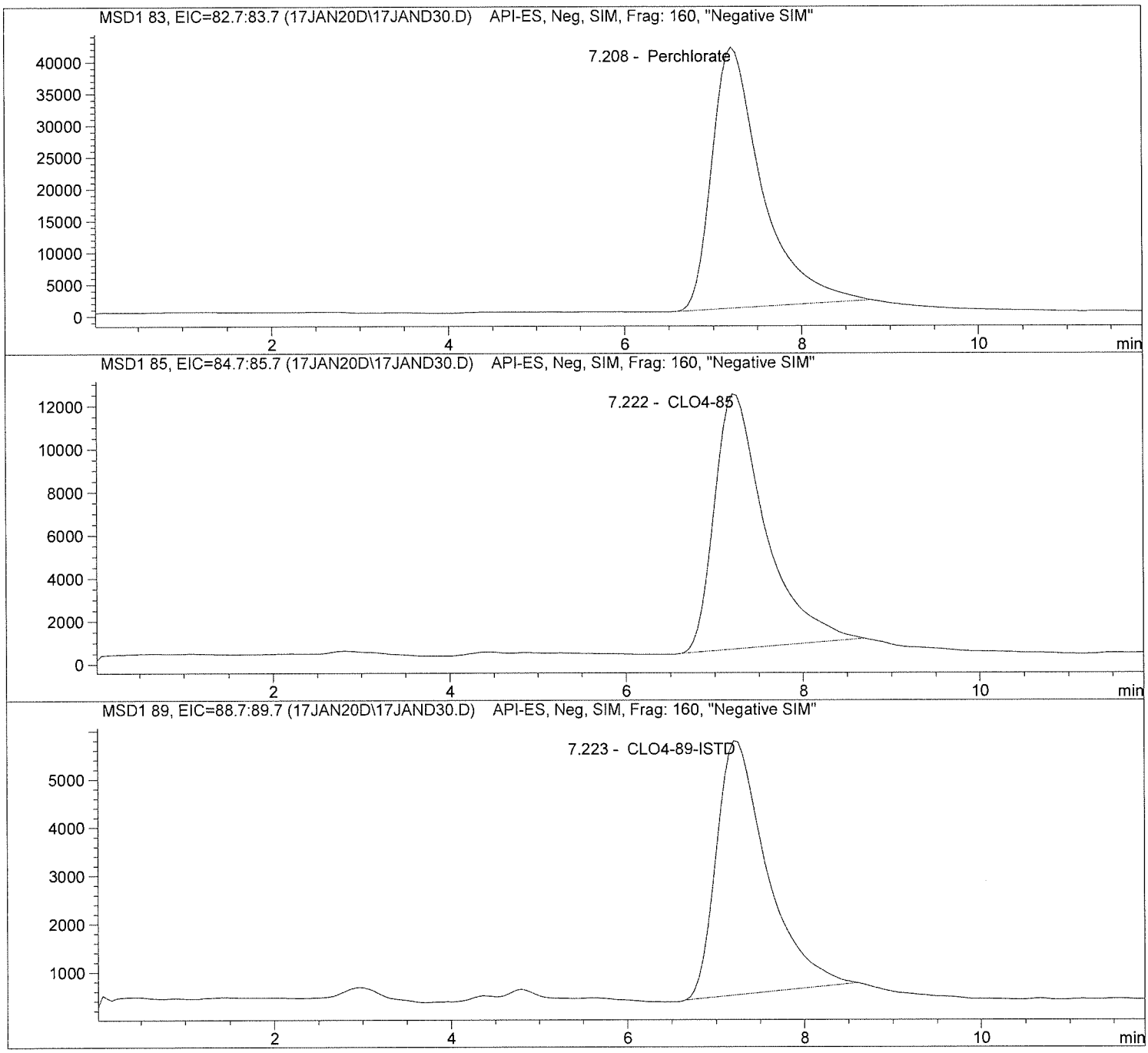
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND30.D Sample Name: 696082 CCV@25

Injection Date:	2/17/2020 16:34:25	Seq Line:	30
Sample Name:	696082 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: 2/17/2020 15:42:52

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND30.D Sample Name: 696082 CCV@25

Injection Date:	2/17/2020 16:34:25	Seq Line:	30
Sample Name:	696082 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: 2/17/2020 15:42:52

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
7.208	PBA	1618661.2	26.2692	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.222	PBA	474563.2	25.3555	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.223	PBA	209446.6	5.0000	CLO4-89-ISTD

*** End of Report ***



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Initial Calibration

Method C:\HPCHEM\1\METHODS\CLO4-DP3.M

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]	Sig	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]	Sig	Lvl	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

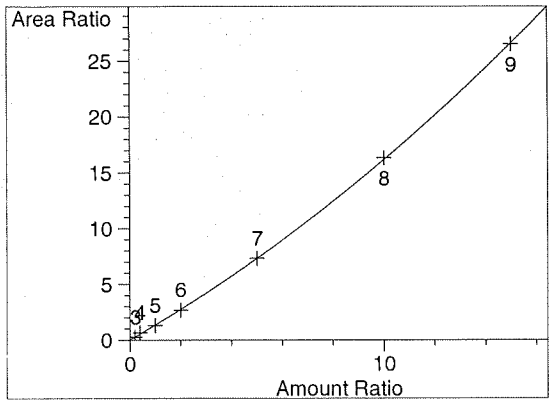
Compound: CLO4-89-ISTD
- Time Window : From 3.581 min To 11.896 min
- Curve Type : Linear
- Origin : Included
- Calibration Level Weights:/
  - Level 3 : 1
  - Level 4 : 1
  - Level 5 : 1
  - Level 6 : 1
  - Level 7 : 1
  - Level 8 : 1
  - Level 9 : 1

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

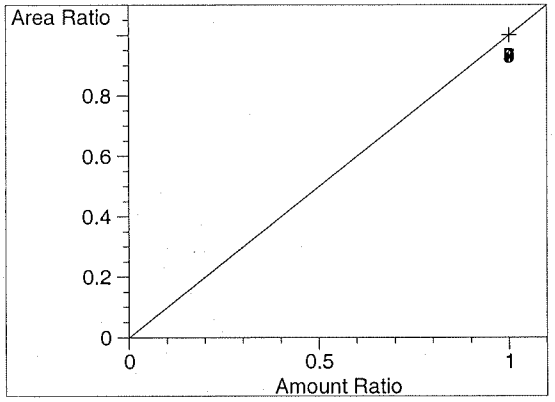
Peak Sum Table

No Entries in table

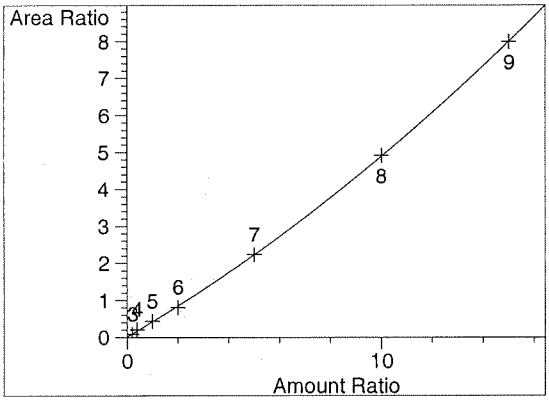
Calibration Curves



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:

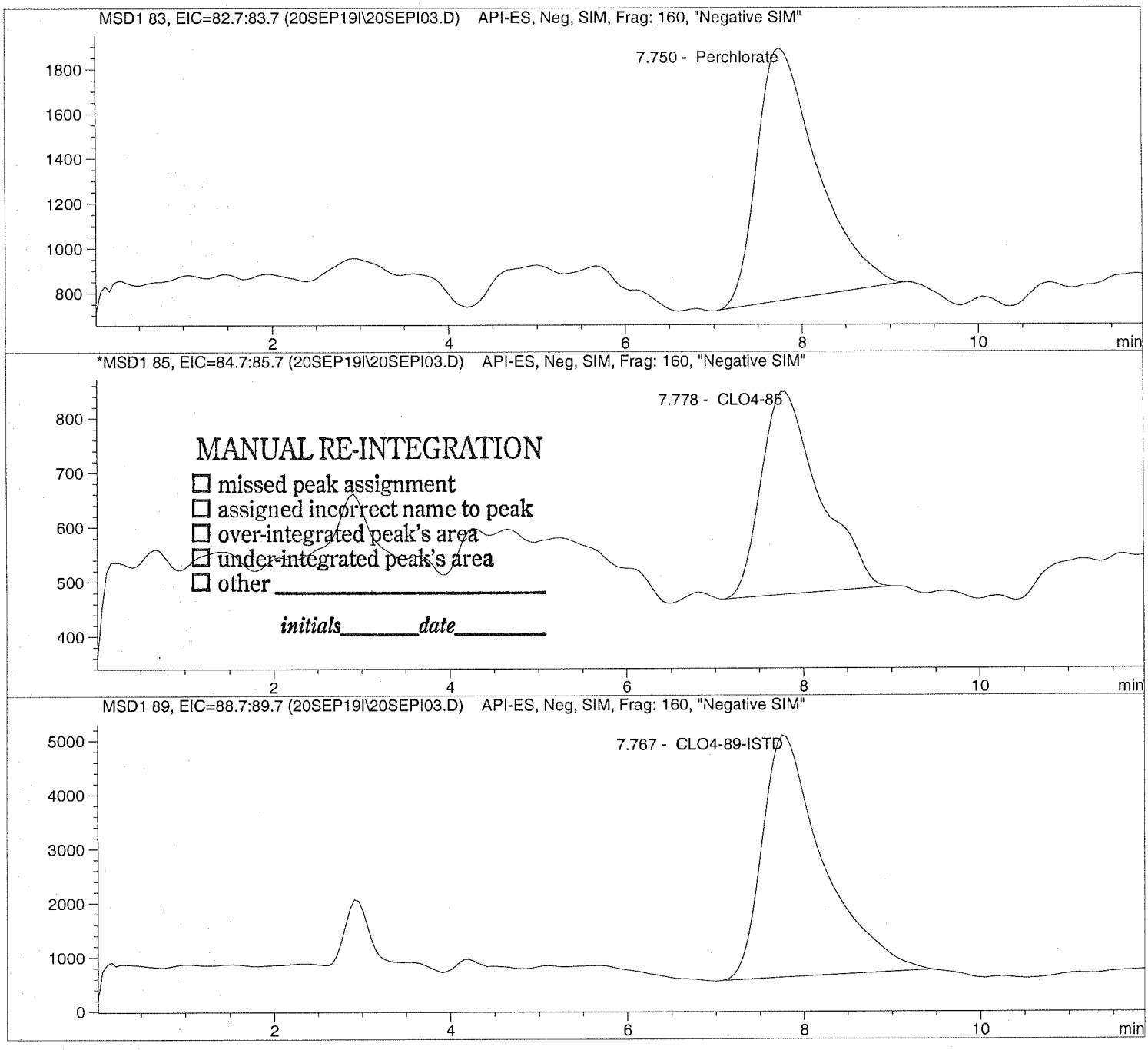
Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
1	Vial 71	CLO4@ 0.2ug/L	CLO4-AQN	1	Ctrl Samp		
2	Vial 72	CLO4@ 0.5ug/L	CLO4-AQN	1	Ctrl Samp		
3	Vial 73	CLO4@ 1.0ug/L	CLO4-AQN	1	Ctrl Samp		
4	Vial 74	CLO4@ 2.0ug/L	CLO4-AQN	1	Ctrl Samp		
5	Vial 75	CLO4@ 5.0ug/L	CLO4-AQN	1	Ctrl Samp		
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

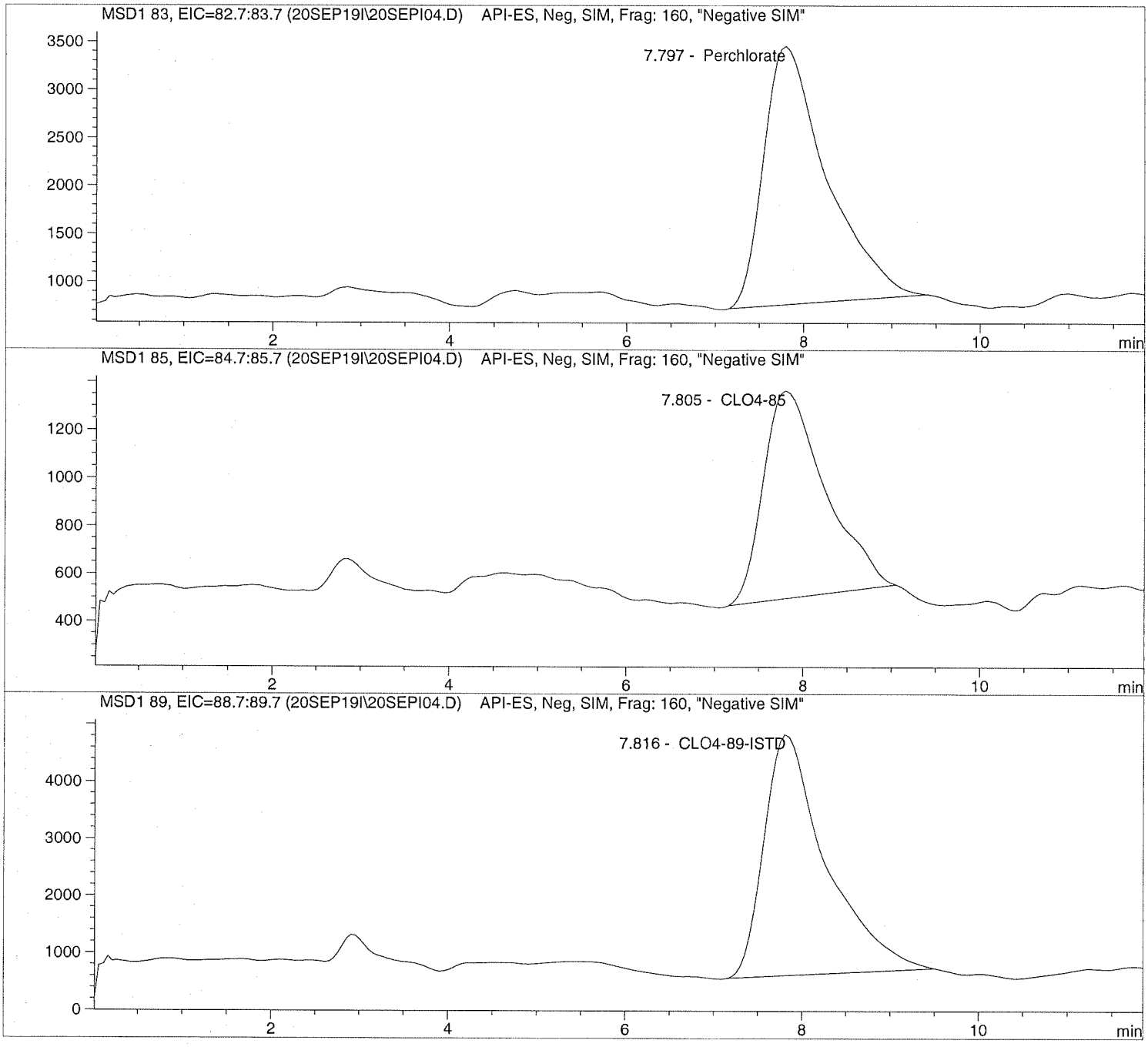
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI04.D Sample Name: CLO4@ 2.0ug/L

Injection Date:	9/20/2019 09:37:58	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

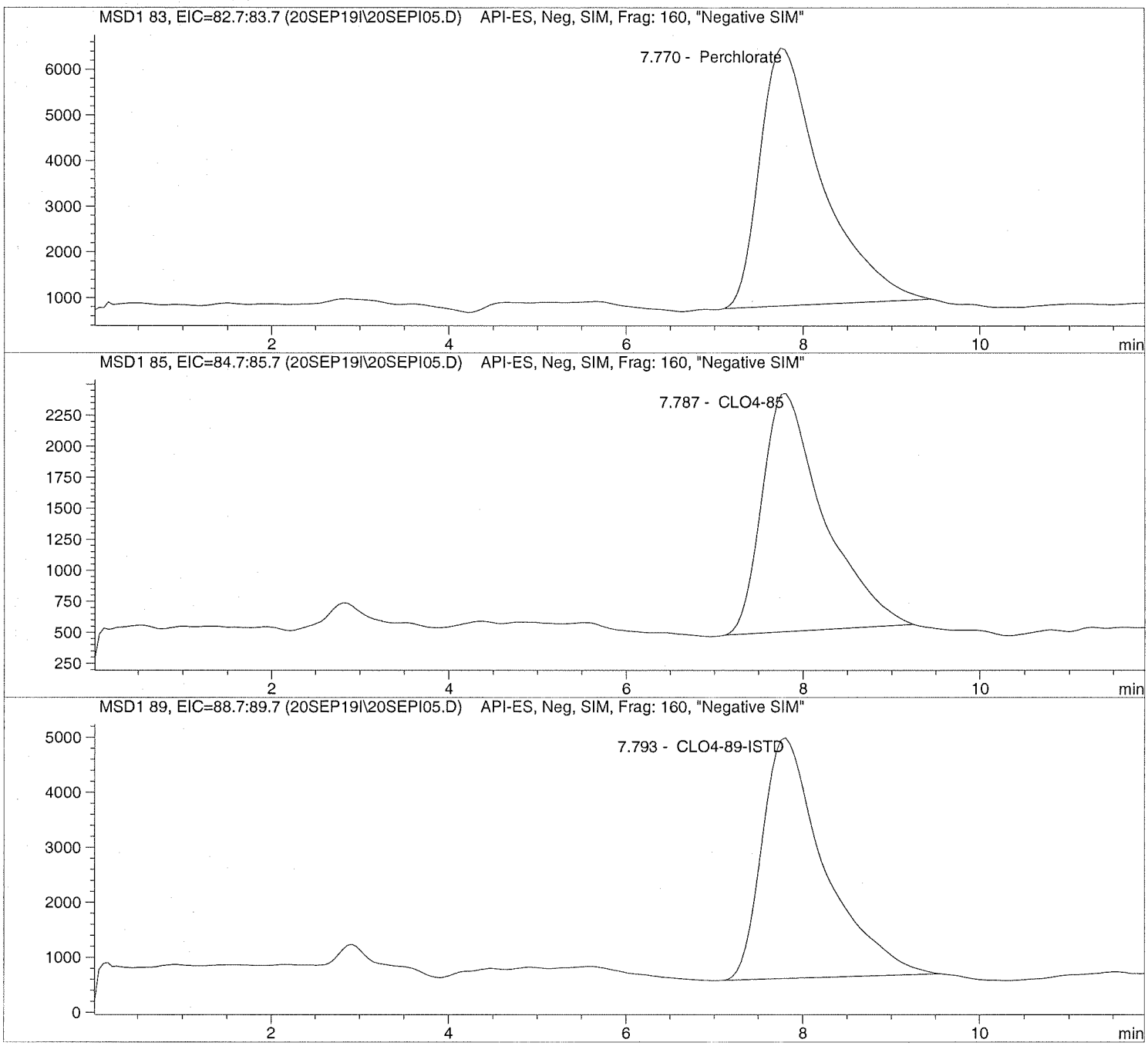
*** End of Report ***

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

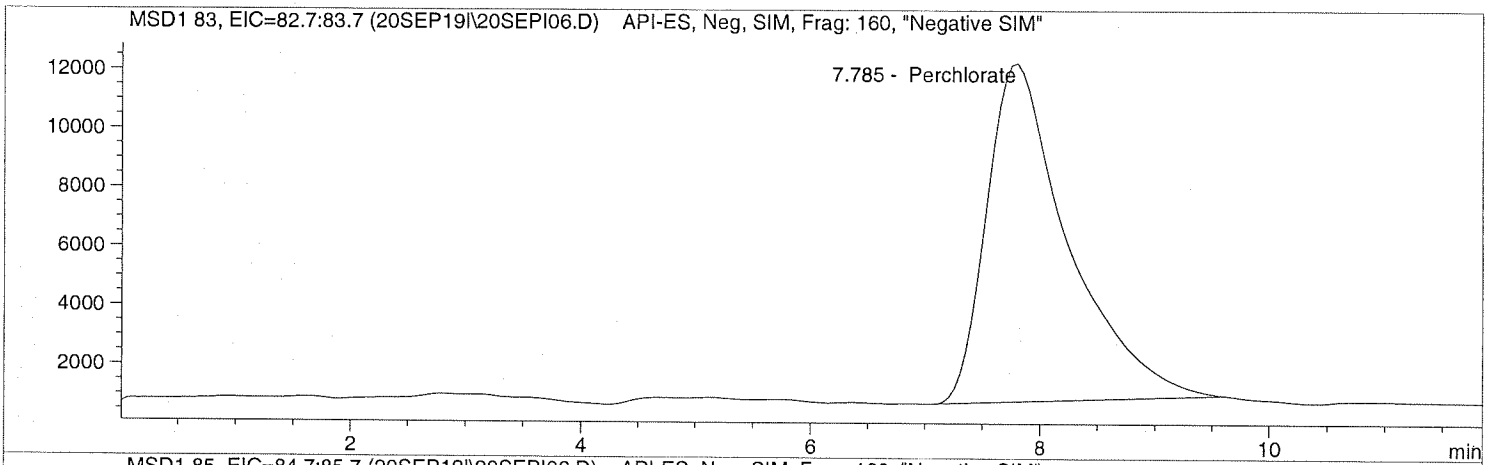
*** End of Report ***

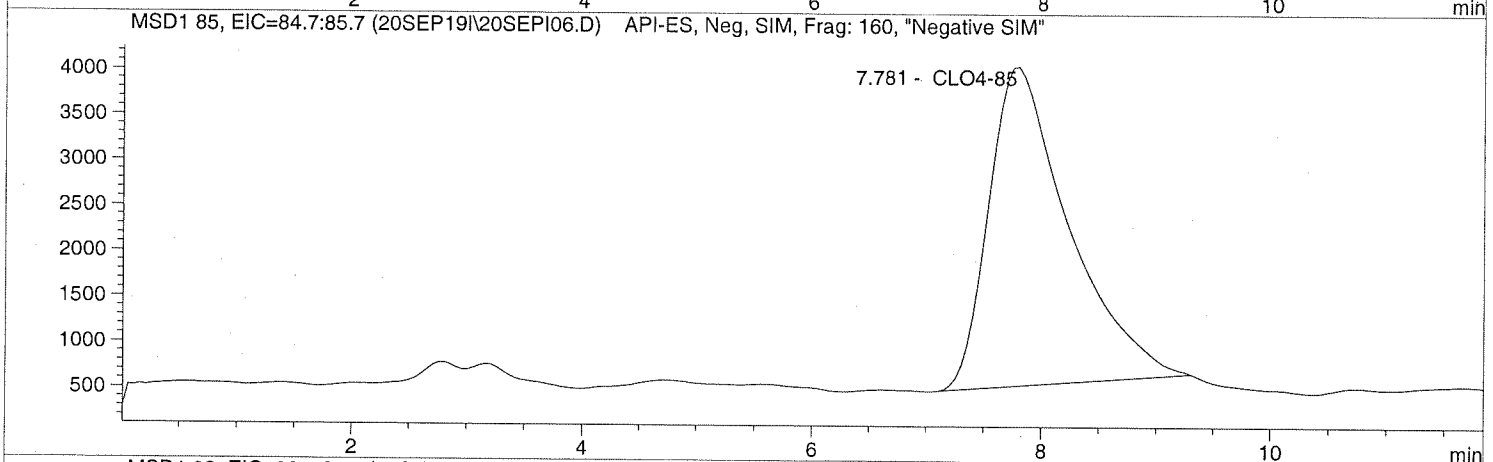
Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI06.D Sample Name: CLO4@ 10.ug/L

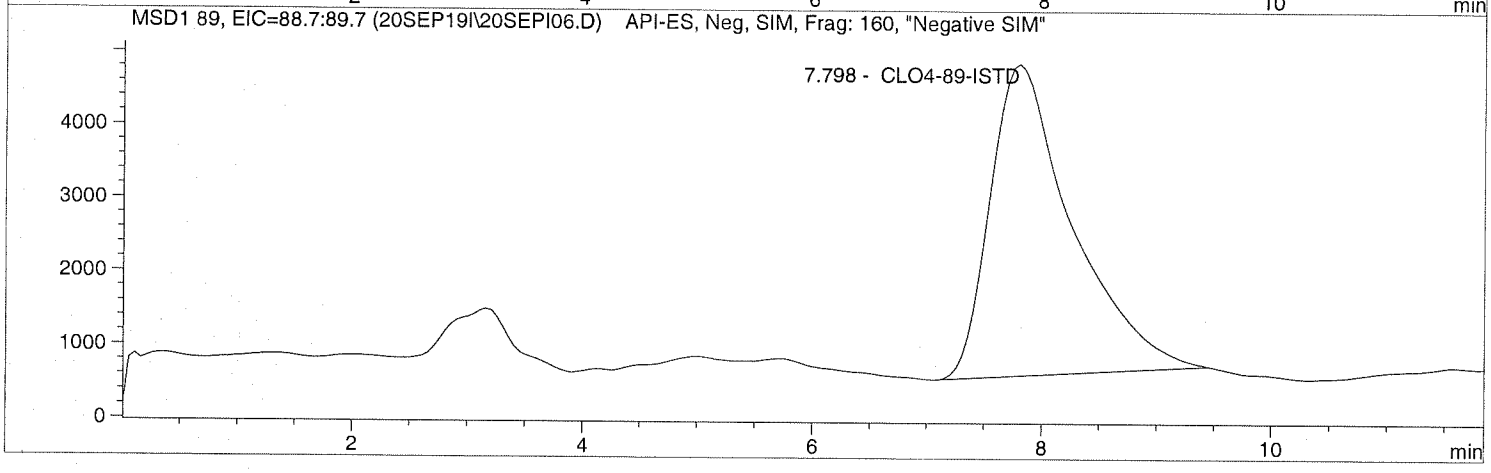
Injection Date:	9/20/2019 10:05:36	Seq Line:	6
Sample Name:	CLO4@ 10.ug/L	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

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

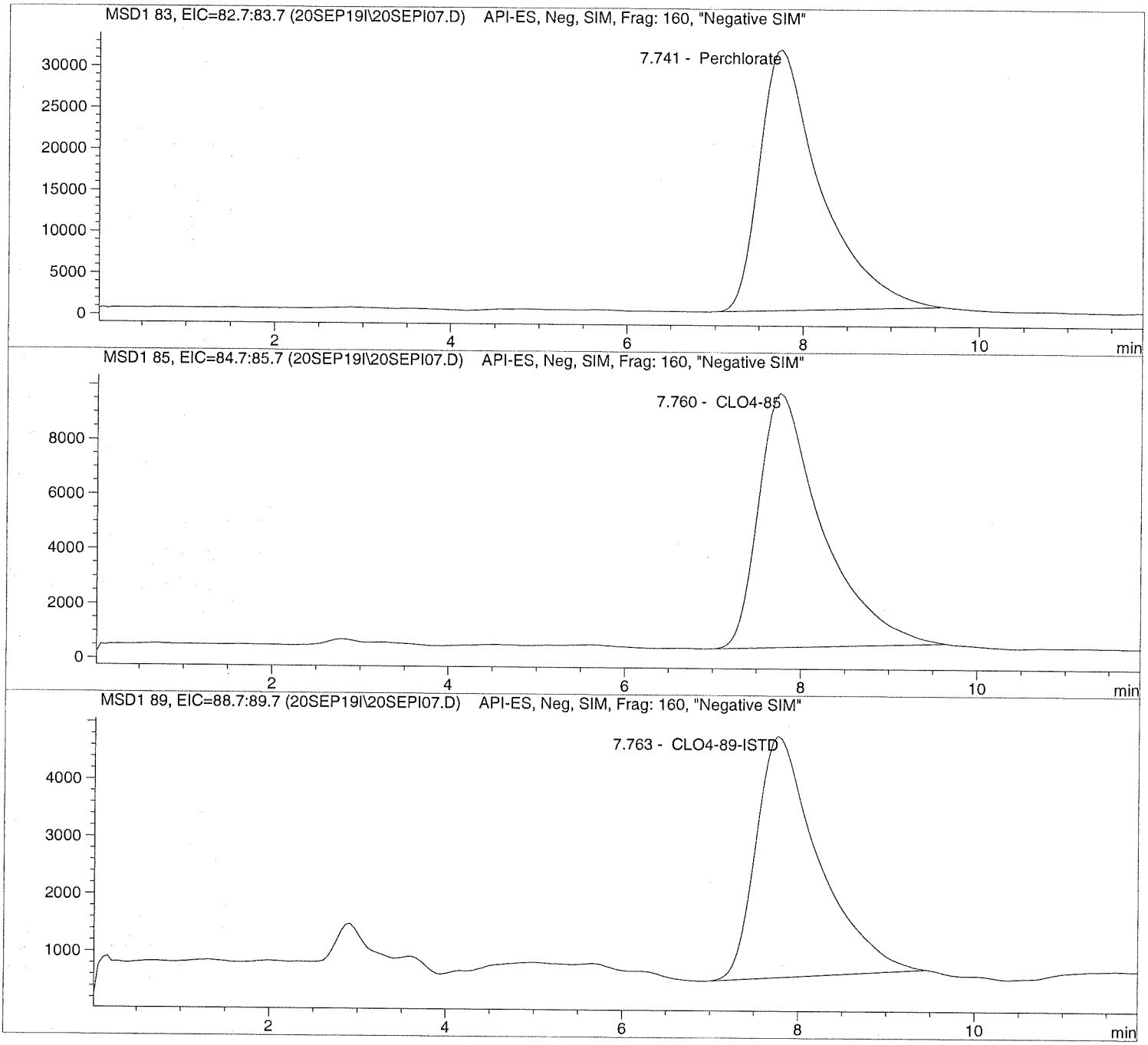
*** End of Report ***

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

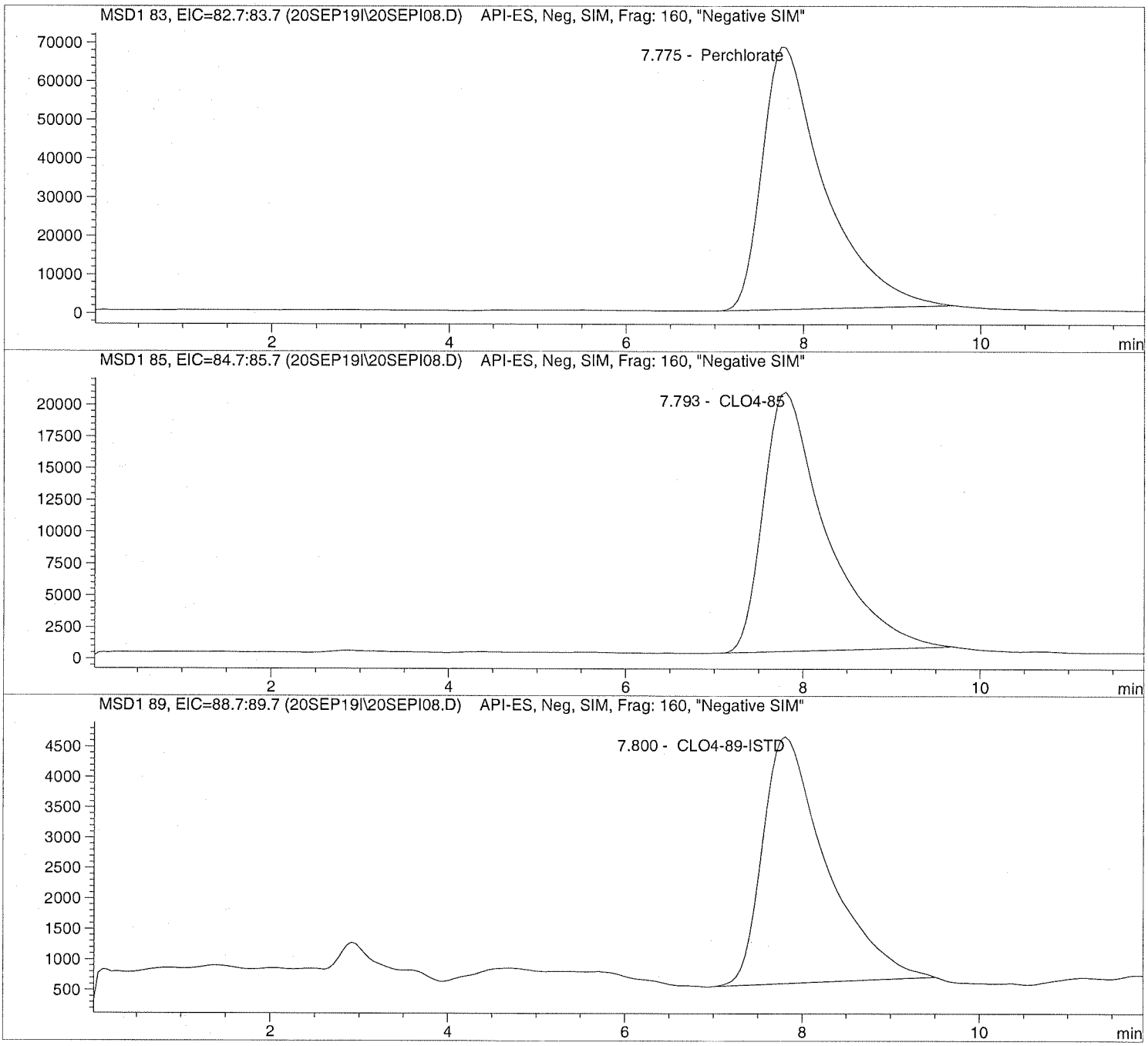
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\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

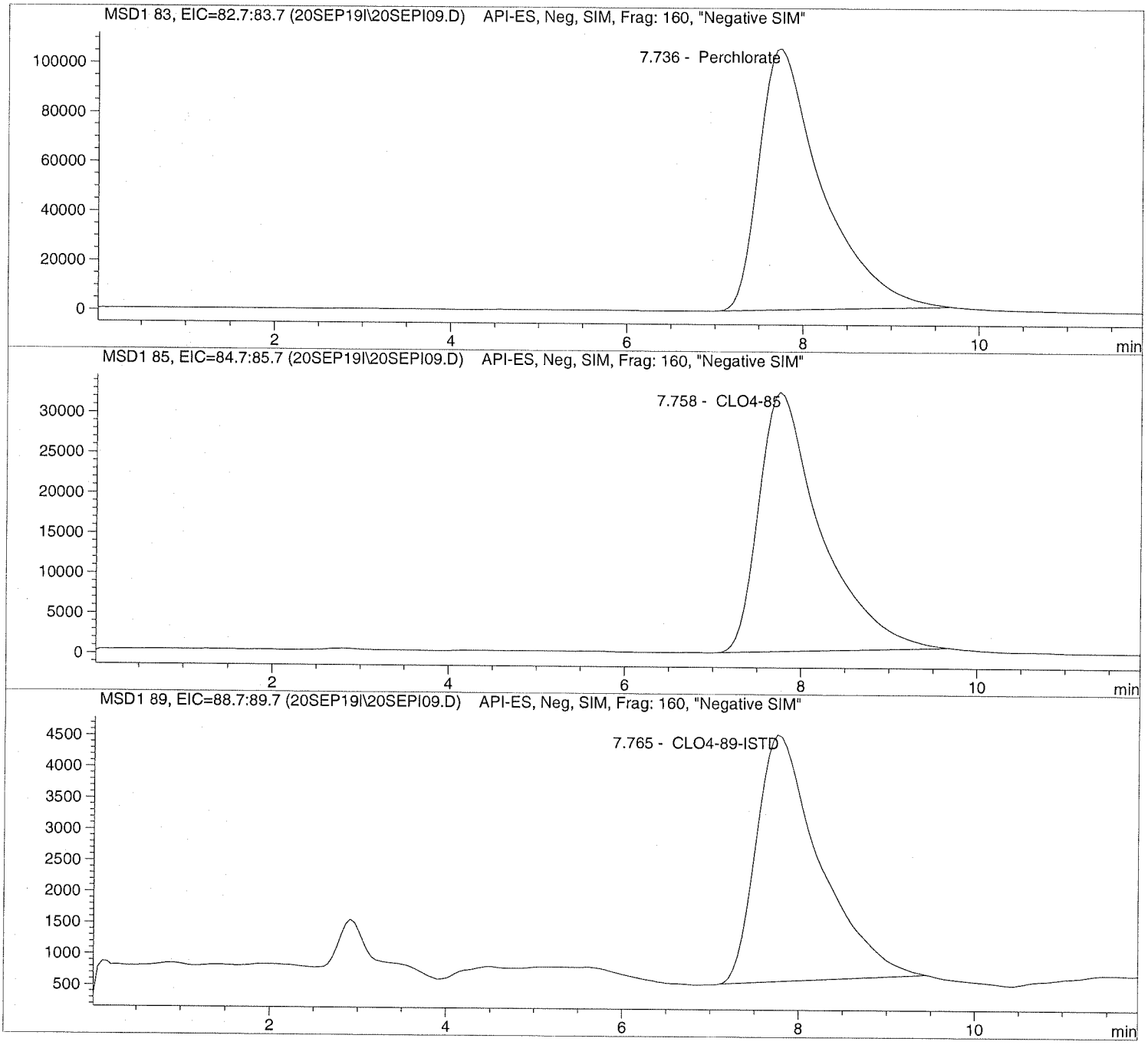
*** End of Report ***

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

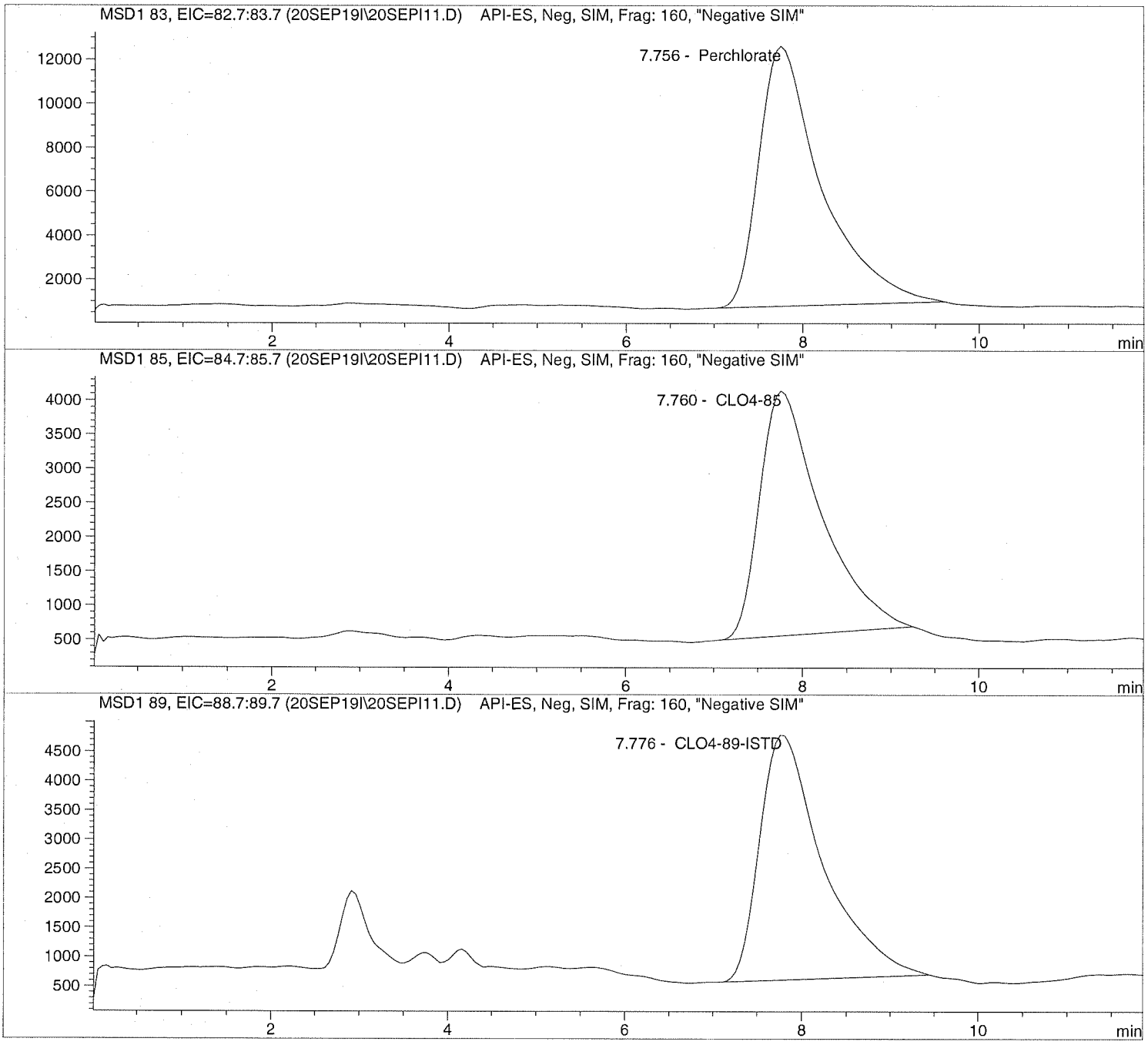
*** End of Report ***

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

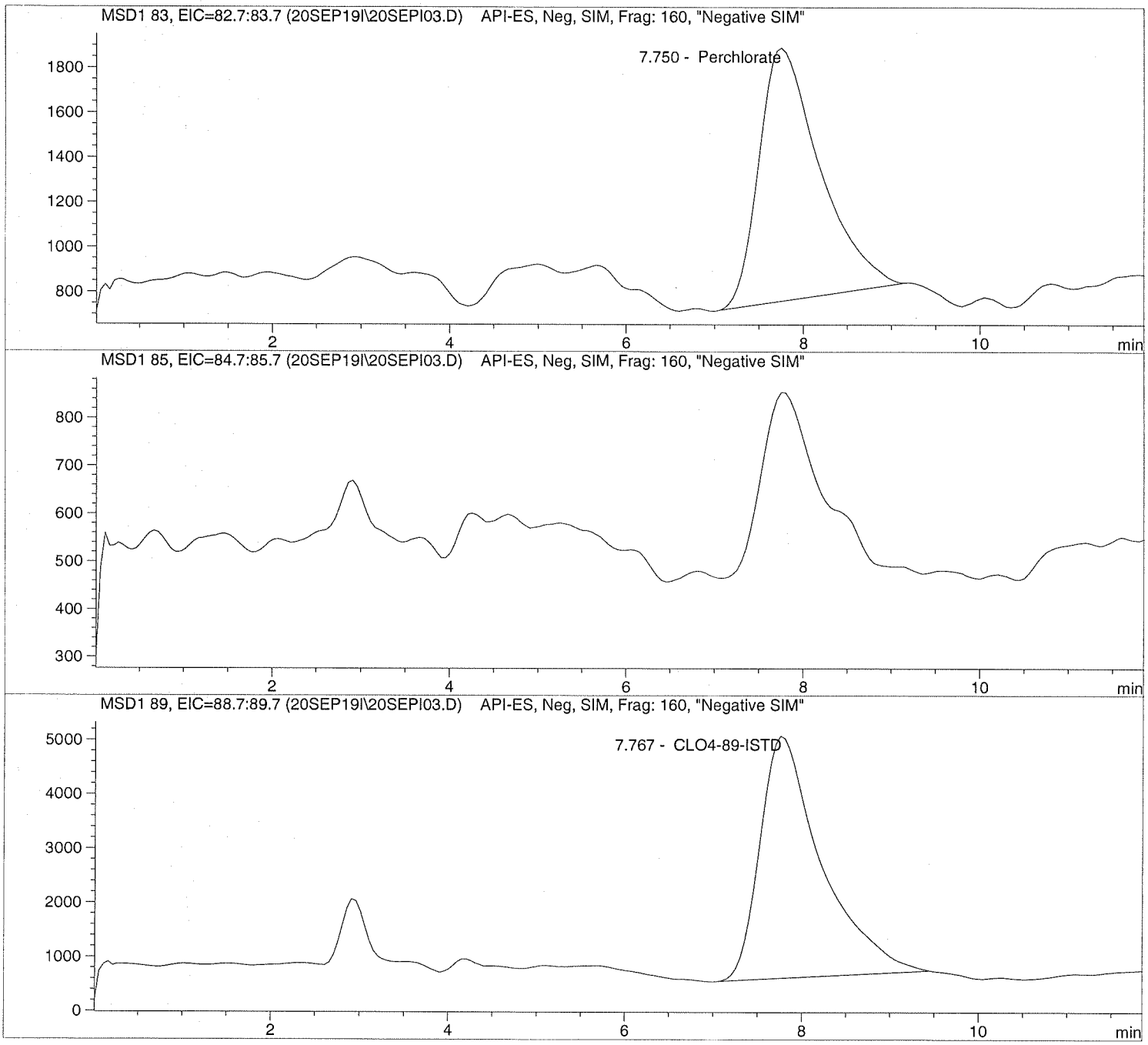
Unmodified

Data file: C:\HPCHEM\1\DATA\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

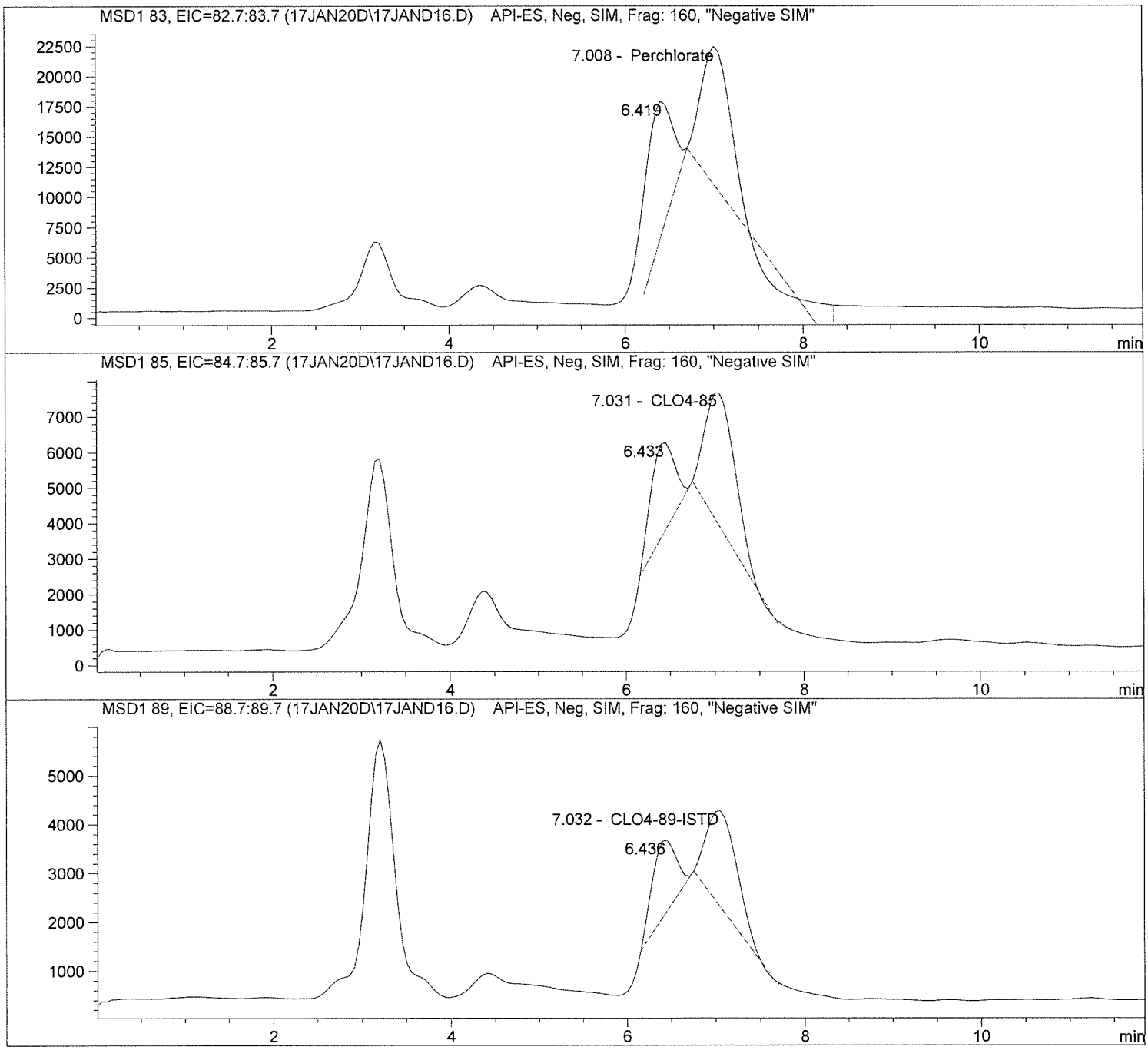
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND16.D Sample Name: 2004548008

Injection Date:	2/17/2020 12:16:47	Seq Line:	16
Sample Name:	2004548008	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: 2/17/2020 15:42:52

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND16.D Sample Name: 2004548008

Injection Date:	2/17/2020 12:16:47	Seq Line:	16
Sample Name:	2004548008	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: 2/17/2020 15:42:52

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
6.419	PB	209415.0	0.0000	
7.008	VBA	265970.0	19.8263	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.433	PB	48374.9	0.0000	
7.031	VBA	86453.2	20.9963	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.436	PB	28797.6	0.0000	
7.032	VBA	46829.2	5.0000	CLO4-89-ISTD

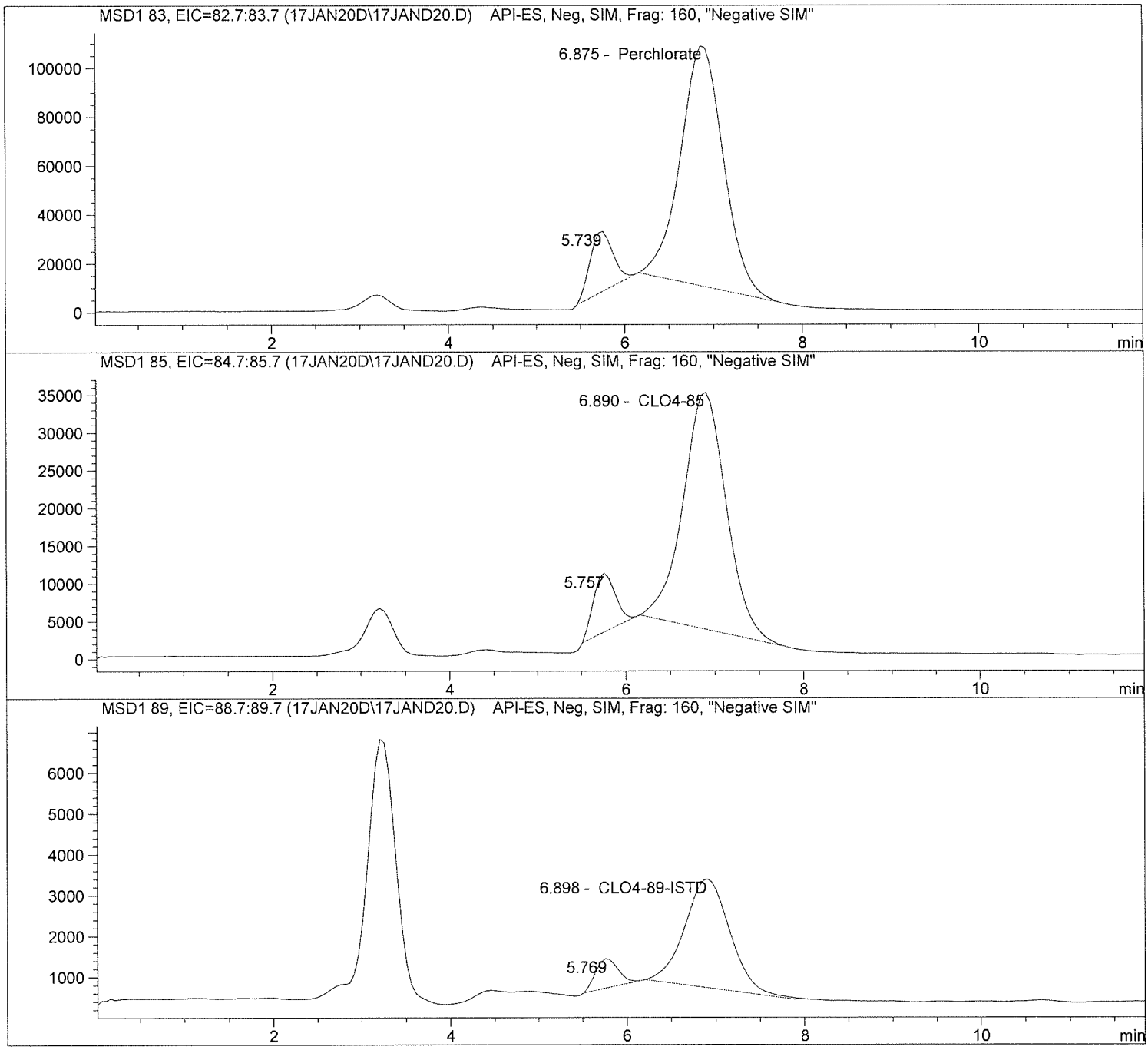
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND20.D Sample Name: 2004548012

Injection Date:	2/17/2020 13:12:19	Seq Line:	20
Sample Name:	2004548012	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: 2/17/2020 15:42:52

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND20.D Sample Name: 2004548012

Injection Date:	2/17/2020 13:12:19	Seq Line:	20
Sample Name:	2004548012	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: 2/17/2020 15:42:52

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
5.739	PB	449533.1	0.0000	
6.875	VBA	3313307.8	93.7006	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
5.757	PB	133767.0	0.0000	
6.890	VBA	1061136.6	98.5589	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
5.769	PB	12736.1	0.0000	
6.898	VBA	93711.6	5.0000	CLO4-89-ISTD

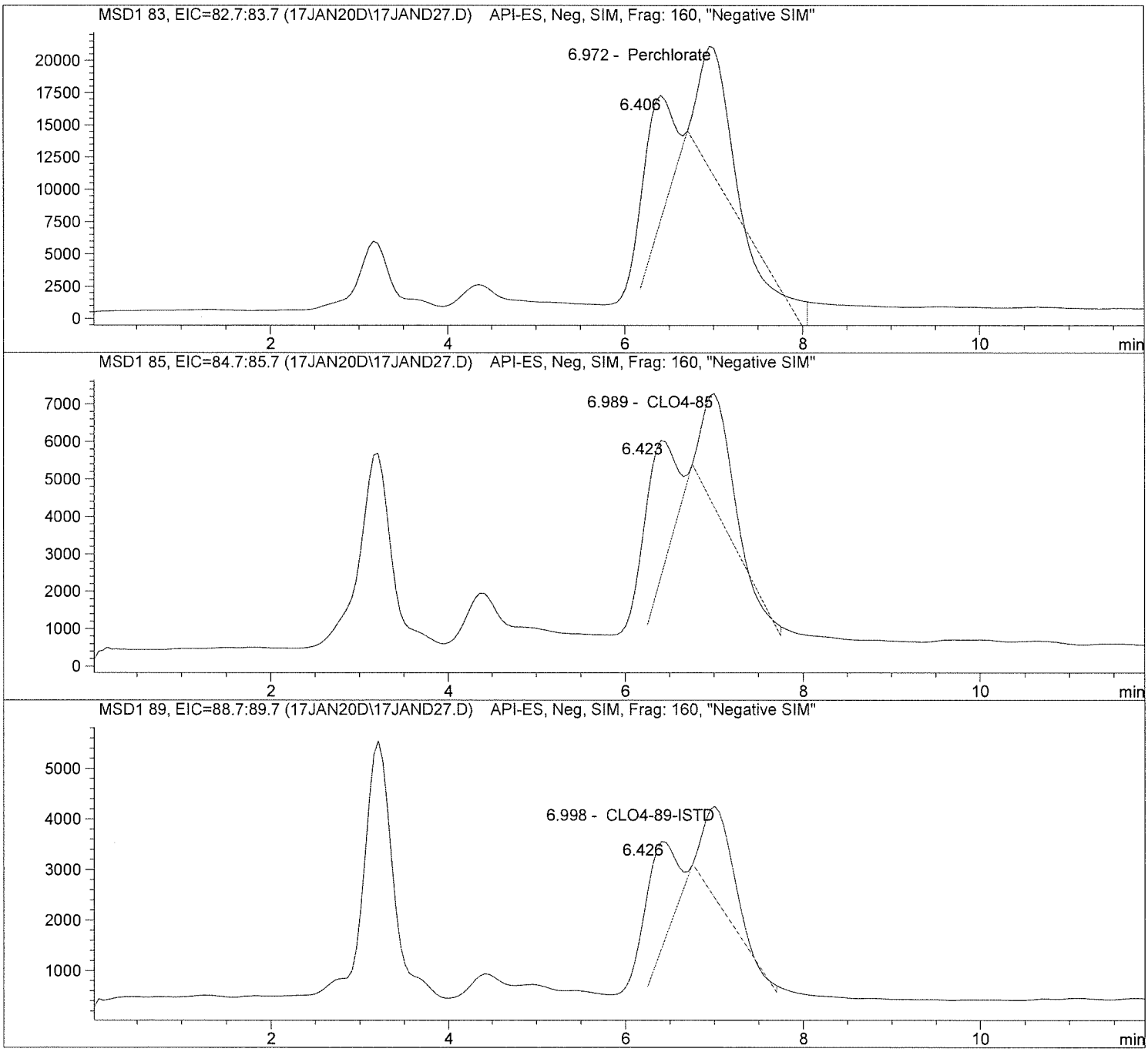
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND27.D Sample Name: 2004548008 RE

Injection Date:	2/17/2020 15:50:22	Seq Line:	27
Sample Name:	2004548008 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: 2/17/2020 15:42:52

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17JAN20D\17JAND27.D Sample Name: 2004548008 RE

Injection Date:	2/17/2020 15:50:22	Seq Line:	27
Sample Name:	2004548008 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: 2/17/2020 15:42:52

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
6.406	PB	201025.8	0.0000	
6.972	VBA	206483.3	17.6236	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.423	PB	66713.4	0.0000	
6.989	VBA	62789.6	17.5220	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.426	PB	39075.6	0.0000	
6.998	VBA	41273.5	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

March 06, 2020

Marcia Olive
Bhate Environmental Associates, Inc.
445 Union Blvd Ste 129
Lakewood, CO 80228

Work Order: **HS20020832**

Laboratory Results for: **Longhorn GW Treatment Plant Weekly Samples**

Dear Marcia,

ALS Environmental received 2 sample(s) on Feb 20, 2020 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: 06-Mar-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Weekly Samples
Work Order: HS20020832

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS20020832-01	LH18/24-SP650_021920	Water		19-Feb-2020 14:00	20-Feb-2020 08:55	☐
HS20020832-02	LH18/24-SP650_021920_BIX	Water		19-Feb-2020 14:00	20-Feb-2020 08:55	☐

ALS Houston, US Date: 06-Mar-20

Client: Bhate Environmental Associates, Inc. **CASE NARRATIVE**
Project: Longhorn GW Treatment Plant Weekly Samples
Work Order: HS20020832

Work Order Comments

• The analysis for Perchlorate was subcontracted to ALS Salt Lake City, UT. Final report attached.

Work Order Comments

• The analysis for TOC was subcontracted to ALS Environmental in Kelso, WA. Final Report attached.

WetChemistry by Method E350.3

Batch ID: R356934

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

WetChemistry by Method E365.3

Batch ID: R356714

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

ALS Houston, US Date: 06-Mar-20

Client: Bhate Environmental Associates, Inc.
ANALYTICAL REPORT
Project: Longhorn GW Treatment Plant Weekly Samples
WorkOrder:HS20020832
Sample ID: LH18/24-SP650_021920
Lab ID:HS20020832-01
Collection Date: 19-Feb-2020 14:00
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
AMMONIA AS N BY E350.3(ISE)		**Method:E350.3**						Analyst: RG
Nitrogen, Ammonia (As N)	**3.7**	a	**0.20**	**0.10**	**0.20**	**mg/L**	1	25-Feb-2020 11:30
ORTHO PHOSPHATE (PO4) AS P BY E365.3		**Method:E365.3**						Analyst: MZD
Phosphorus, Total Orthophosphate (As P)	**0.486**	a	**0.0100**	**0.0250**	**0.0250**	**mg/L**	1	20-Feb-2020 16:45
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	02-Mar-2020 08:27

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

ALS Houston, US Date: 06-Mar-20

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**

Project: Longhorn GW Treatment Plant Weekly Samples WorkOrder:HS20020832

Sample ID: LH18/24-SP650_021920_BIX Lab ID:HS20020832-02

Collection Date: 19-Feb-2020 14:00 Matrix:Water

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-Mar-2020 12:30

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

ALS Houston, US Date: 06-Mar-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Weekly Samples
WorkOrder: HS20020832

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R356714 (0)	**Test Name :** ORTHO PHOSPHATE (PO4) AS P BY E365.3				**Matrix:** Water	
HS20020832-01	LH18/24-SP650_021920	19 Feb 2020 14:00			20 Feb 2020 16:45	1
Batch ID: R356934 (0)	**Test Name :** AMMONIA AS N BY E350.3(ISE)				**Matrix:** Water	
HS20020832-01	LH18/24-SP650_021920	19 Feb 2020 14:00			25 Feb 2020 11:30	1
Batch ID: R357320 (0)	**Test Name :** SUBCONTRACT ANALYSIS - TOC ANALYSIS				**Matrix:** Water	
HS20020832-01	LH18/24-SP650_021920	19 Feb 2020 14:00			02 Mar 2020 08:27	1
Batch ID: R357681 (0)	**Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)				**Matrix:** Water	
HS20020832-02	LH18/24-SP650_021920_BIX	19 Feb 2020 14:00			06 Mar 2020 12:30	1

ALS Houston, US Date: 06-Mar-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Weekly Samples
WorkOrder: HS20020832

QC BATCH REPORT

Batch ID: R356714 (0) **Instrument: UV-2450** **Method: ORTHO PHOSPHATE (PO4) AS P BY E365.3**

MBLK Sample ID: **MBLK-R356714** Units: **mg/L** Analysis Date: **20-Feb-2020 16:45**
Client ID: Run ID: **UV-2450_356714** SeqNo: **5481673** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total Orthophosphate (As P)	0.0250	0.0250								U

LCS Sample ID: **LCS-R356714** Units: **mg/L** Analysis Date: **20-Feb-2020 16:45**
Client ID: Run ID: **UV-2450_356714** SeqNo: **5481672** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total Orthophosphate (As P)	0.222	0.0250	0.25	0	88.8	85 - 115				

MS Sample ID: **HS20020822-01MS** Units: **mg/L** Analysis Date: **20-Feb-2020 16:45**
Client ID: Run ID: **UV-2450_356714** SeqNo: **5481805** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total Orthophosphate (As P)	0.316	0.0250	0.25	0.082	93.6	80 - 120				

MSD Sample ID: **HS20020822-01MSD** Units: **mg/L** Analysis Date: **20-Feb-2020 16:45**
Client ID: Run ID: **UV-2450_356714** SeqNo: **5481806** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total Orthophosphate (As P)	0.305	0.0250	0.25	0.082	89.2	80 - 120	0.316	3.54	20	

The following samples were analyzed in this batch: HS20020832-01

ALS Houston, US Date: 06-Mar-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Weekly Samples
WorkOrder: HS20020832

QC BATCH REPORT

Batch ID: R356934 (0) **Instrument: WetChem_HS** **Method: AMMONIA AS N BY E350.3(ISE)**

MBLK Sample ID: **MBLK-R356934** Units: **mg/L** Analysis Date: **25-Feb-2020 11:30**
Client ID: Run ID: **WetChem_HS_356934** SeqNo: **5486119** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Ammonia (As N)	0.10	0.20								U

LCS Sample ID: **LCS-R356934** Units: **mg/L** Analysis Date: **25-Feb-2020 11:30**
Client ID: Run ID: **WetChem_HS_356934** SeqNo: **5486118** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Ammonia (As N)	10.02	0.20	10	0	100	80 - 120				

MS Sample ID: **HS20020728-01MS** Units: **mg/L** Analysis Date: **25-Feb-2020 11:30**
Client ID: Run ID: **WetChem_HS_356934** SeqNo: **5486121** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Ammonia (As N)	10.13	0.20	10	0.13	100.0	80 - 120				

MSD Sample ID: **HS20020728-01MSD** Units: **mg/L** Analysis Date: **25-Feb-2020 11:30**
Client ID: Run ID: **WetChem_HS_356934** SeqNo: **5486120** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Ammonia (As N)	10.12	0.20	10	0.13	99.9	80 - 120	10.13	0.0494	20	

The following samples were analyzed in this batch: HS20020832-01

ALS Houston, US Date: 06-Mar-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Weekly Samples
WorkOrder: **HS20020832**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	19-028-0	27-Mar-2020
California	2919, 2019-2020	30-Apr-2020
Dept of Defense	ANAB L2231 V009	22-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	624-2020	31-Dec-2020
North Dakota	R-193 2019-2020	30-Apr-2020
Oklahoma	2019-067	31-Aug-2020
Texas	T104704231-19-25	30-Apr-2020

ALS Houston, US Date: 06-Mar-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Weekly Samples
Work Order: HS20020832

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS20020832-01	LH18/24-SP650_021920	Login	2/20/2020 12:24:00 PM	NDR	WET083
HS20020832-01	LH18/24-SP650_021920	Login	2/20/2020 12:24:00 PM	NDR	WET083
HS20020832-01	LH18/24-SP650_021920	Login	2/20/2020 12:24:00 PM	NDR	Sub
HS20020832-02	LH18/24-SP650_021920_BIX	Login	2/20/2020 12:24:00 PM	NDR	Sub

ALS Houston, US Date: 06-Mar-20

Sample Receipt Checklist

Client Name: Bhate Environmental
Work Order: HS20020832
Date/Time Received: **20-Feb-2020 08:55**
Received by: **NDR**

Checklist completed by: *Nilesh D. Ranchod* eSignature 20-Feb-2020 Date
Reviewed by: *RJ Modashia* eSignature 20-Feb-2020 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 ☐	COC IDs:None
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	0.5c U/C	IR25	
Cooler(s)/Kit(s):	45501		
Date/Time sample(s) sent to storage:	2/20/2020 13:00		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

CHAIN OF CUSTODY

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

Page 1 of 1

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

Project No. NWO1312.0150.0 16.0001

Job: GROUNDWATER TREATMENT PLANT WEEKLY SAMPLES

Prepared By: Scott Beesinger

P.O. Number

Field Sample I.D.	Sample Matrix	Date / Time	MS / MSD	No. OF CONTAINERS	AMMONIA-N	TOTAL ORGANIC CARBON	ORTHO-PHOSPHATE	PERCHLORATE							Remarks (Preservatives, etc.)	Lab I.D.#
LH18/24-SP650_021920	Water	02/19/20 / 14:00		3	X	X									H2SO4	
LH18/24-SP650_021920	Water	02/19/20 / 14:00		1			X								NONE	
LH18/24–SP650_021920_BIX	Water	02/19/20 / 14:00		1				X							NONE	

HS20020832
Bhate Environmental Associates, Inc.
Longhorn GW Treatment Plant Weekly Samples

Additional Remarks: **Standard TAT on all parameters**

Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
Scott Beesinger	02/19/20	14:30	NA	2.20.20	08:55						

For Lab Use Only

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

Remarks:

45501 Temp UK 0.5

1R Xe 25.

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

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

45501

CUSTODY SEAL

Date: 2/19/20 Time: 1430
Name: Scott Beesinger
Company: Bhate

Seal Broken By: SM
Date: 02/20/20

45501 FEB 20 2020

Must Deliver Next Business Day
Time and Tempature Sensitive!

45501

ORIGIN ID:SGRA (903) 930-6193
SCOTT BEESINGER
APTIM ENVIROMENTAL & INFASTRUCTURE
1203-B EAST GRAND AVE
PMB 202
MARSHALL, TX 75670
UNITED STATES US

SHIP DATE: 170CT18
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) 530-5656
REF: LHAAP 67 - RJ

RMA:

FedEx Express

FedEx
TRK# 0221 4380 9533 6747

THU - 20 FEB 10:30A
PRIORITY OVERNIGHT

AB SGRA

77099
TX-US
IAH

FID 3865960 19FEB20 GGGA 56AC2/049E/05A2

Case Narrative

Method: 6850
Analysis: Perchlorate
Analysis SOP: LC-MS-CLO4
ALS WO ID(s): 2005502

Client: ALS Laboratories (Houston, TX)
Matrix: Water
ELMS Batch (HBN): 2354 (258383)

General Set Information: There was one field sample in this Work Order. The sample was 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. 50µL 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 0.45µm Syringe filters.

Holding Times: Holding times were met for all analyses.

Dilutions: NA

Method QC data: The method blank (LMB 698431) was less than 1/2 the CRDL. The recovery for the LCS (698428) was within acceptable parameters.

MS/MSD Analysis: MS/MSD was performed on sample 2005502001 (Client ID: LH18/24-SP650_021920_BIX Water). 3.0µL of Working Standard Solution Horizon ID 49947 was added to 10.0mL of sample preparation. The spike target was 3.µg/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 µg/L. Results were calculated in µg/L by the equation (A)x(B),

where: A = Analyte concentration from the standard curve (µg/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 – 698429) is reported from the analysis of the Laboratory Control Sample (LCS – 698428) at a level of 3.0µg/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 March 05, 2020
Analyst Date

ANALYTICAL REPORT

Report Date: March 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: **34-2005502**
Project ID: HS20020832-02
Purchase Order: HS20020832-02
Project Manager Kevin W. Griffiths

Client Sample ID	Lab ID	Collect Date	Receive Date	Sampling Site
LH18/24-SP650_021920_BIX Water	2005502001	02/19/20	02/22/20	HS20020832-02

ANALYTICAL REPORT

Workorder: 34-2005502
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: **LH18/24-SP650_021920_BIX Water**
Lab ID: 2005502001
Matrix: Water

Sampling Site: HS20020832-02
Media: 250 mL Nalgene
Sampling Parameter: NA

Collected: 02/19/2020
Received: 02/22/2020

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable

Analysis: EPA 6850, DoD QSM Water
Batch: ELMS/2354 (HBN: 258383)
Analyzed: 03/05/2020 09:32

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

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 03/05/2020 15:38	/S/ Stephen Brose 03/06/2020 06:50

Laboratory Contact Information

ALS Environmental
960 W Levoy Drive
Salt Lake City, Utah 84123

Phone: (801) 266-7700
Email: alslt.lab@ALSGlobal.com
Web: www.alsslc.com

ANALYTICAL REPORT

Workorder: 34-2005502
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.
The following was provided by the client: Sample ID, Collection Date, Sampling Location, Media Type, Sampling Parameter.
Collection Date, Media Type, and Sampling Parameter can potentially affect the validity of the results.
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

Analysis Information

Workorder: 2005502

Limits:	Client SOW/Contract Specified	**Preparation:**	NA	**Analysis:**	EPA 6850, DoD QSM
Basis:	DoD QSM	**Batch:**	NA	**Batch:**	ELMS/2354 (HBN: 258383)
		Prepared By:	NA	**Analyzed By:**	Thomas Bosch

Blank

LMB: 698431
Analyzed: 03/05/2020 09:18
Units: ug/L

Analyte	Result	MDL	RL
Perchlorate	ND	1	2.00

Laboratory Control Sample

LCS: 698428
Analyzed: 03/05/2020 08:51
Dilution: 1
Units: ug/L

Analyte	Result	Target	% Rec	QC Limits	
Perchlorate	2.95	3.00	98.5	78.8	123.8

Matrix Spike - Matrix Spike Duplicate

Sample: 2005502001	**MS:** 698432	**MSD:** 698433
Analyzed: 03/05/2020 09:32	**Analyzed:** 03/05/2020 09:46	**Analyzed:** 03/05/2020 10:01
Dilution: 1	**Dilution:** 1	**Dilution:** 1
Units: ug/L	**Units:** ug/L	**Units:** ug/L

Analyte	Result	Result	Target	% Rec	QC Limits		Result	% Rec	RPD	QC Limits	
Perchlorate	ND	2.63	3	87.6	78.8	123.8	2.82	93.9	6.95	0.0	20.0

QC Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Analyst	Peer Review
/S/ Thomas Bosch	/S/ Stephen Brose
03/05/2020 15:43	03/06/2020 06:50

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

2005502

2005502

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: **Dept of Defense** **COC ID:** **13372**

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:	HS20020832
TSR:	Danielle Winnings

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS20020832-02**	**LH18/24-SP650_021920_BIX**	**Water**	**19 Feb 2020 14:00**
	SUB_Perch-6850			28 Feb 2020

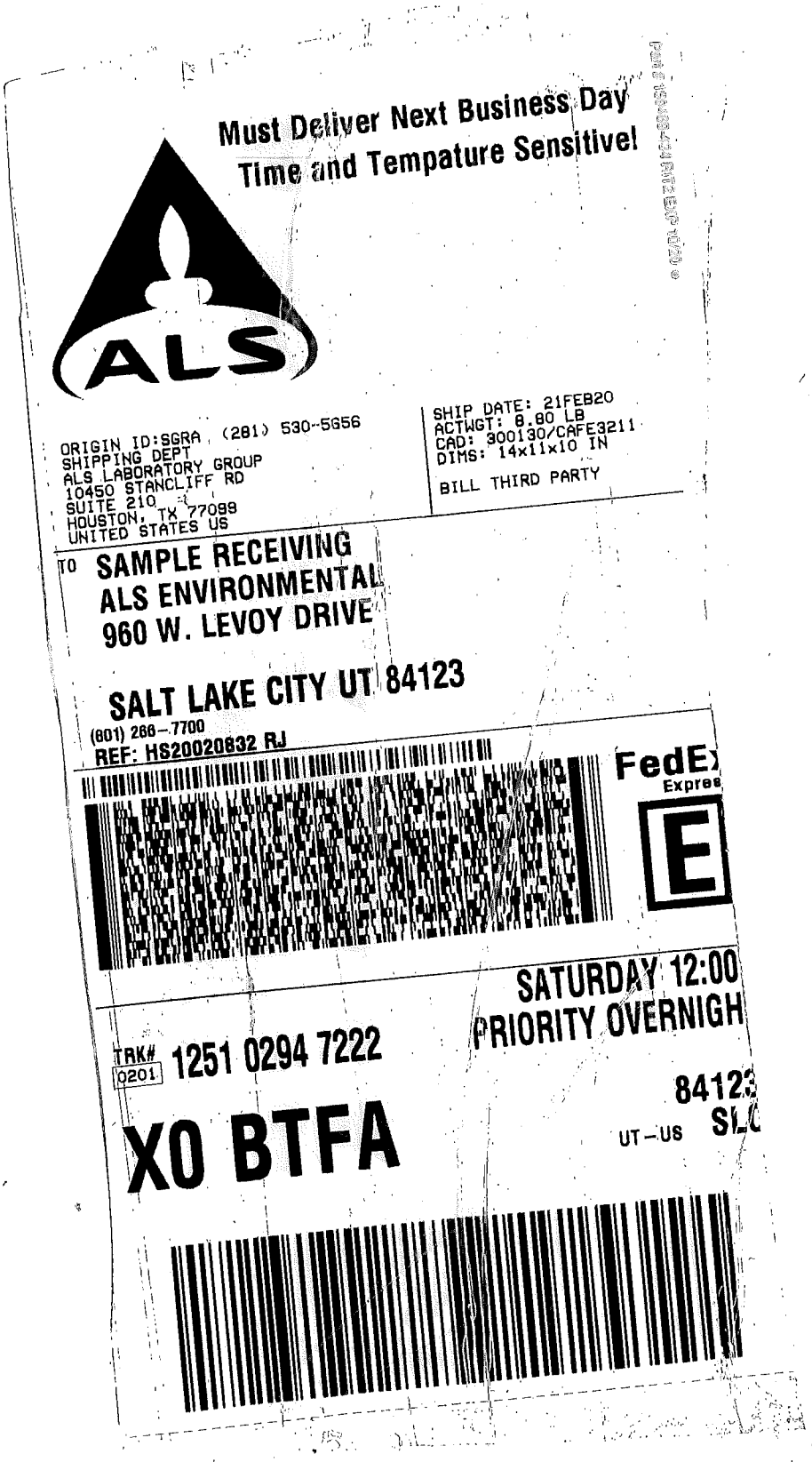
Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.

QC Level: DOD IV (DoD Data Package)

Relinquished By: J. McMahon Date/Time: 2/21/20 18:00

Received By: Date/Time: 2/22/20 944

Cooler ID(s): Temperature(s): 3°



Must Deliver Next Business Day
Time and Tempature Sensitive!

ORIGIN ID:SGRA (281) 530-5656
SHIPPING DEPT
ALS LABORATORY GROUP
10450 STANCLIFF RD
SUITE 210
HOUSTON, TX 77099
UNITED STATES US

SHIP DATE: 21FEB20
ACTWGT: 8.80 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) 266-7700
REF: HS20020832 RJ

FedEx
Expres

SATURDAY 12:00
PRIORITY OVERNIGH

TRK# 0201 1251 0294 7222

XO BTFA

84123
UT-US SL

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: 2/22/20 944

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 Frozen/Melted/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	Good	3 °C	4		°C	7		°C
2		°C	5		°C	8		°C
3		°C	6		°C	9		°C

Taken By: Meredith Dennis (Signature) Meredith Dennis (Printed Name) 2/22/20 (Date)

CLIENT-RELATED INFORMATION

☐ Missing Cooler	☐ Missing Samples/Bottles	☐ Incorrect Preservation	☐ Insufficient Sample Volume
☐ Cooler Conditions	☐ Broken/Leaking Samples	☐ pH Criteria Not Met	☐ Chain of Custody Problems
☐ Missing Paperwork	☐ Incorrect Bottle Type	☐ Residual Chlorine Present	☐ Other:
☐ Missing/Incorrect Bottle Labels	☐ Cooler Temperatures Out of Range	☐ 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: _____ (Printed Name) Returned to Sample Receipt by: _____ (Signature) Date: _____

00969803

ALS Environmental

CHAIN-OF-CUSTODY

Project / Job / Task: HS20020832-02	***Split:***	**Workorder ID: 2005502**	**Level:** ENV_LVL4	**Requested Analysis**
Client: ALS Environmental (Houston)		**Account:** 8101	**Type:** 250Poly	
Comments:			**Preservatives**	

Item	Collect Date/Time	Sample ID	Lab ID	QC	Matrix	Containers ID(s)	Containers Count	COOL	EPA 6850, DoD QSM
1	02/19/2020 14:00	LH18/24-SP650_021920_BIX Water	2005502001		Water	A	1		A

24 of 154

ORIGINAL FIELD SAMPLE CHAIN-OF-CUSTODY

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location
VanTassell, Tami	02/22/2020 09:48	ALS Sample Receiving	Sample Login
Tami VanTassell R.33.	02-24-20 8:20	ISC	Storage
	03-05-20/08:15	T. Boyd	CL04 analysis

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

Batch Worklist

Batch: ELMS/ 2354 Created: 3/5/2020 07:44 Instrument: HBN: 258383

Rule: EPA 6850, DoD QSM Water Analyst: T. Bosch Status: WP

Workorder: 2005502 [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	698427	CCV for HBN 258383 [ELMS/2354]				CCV	3		E685041C3Q	5311		3/6/2020	
2	698428	LCS for HBN 258383 [ELMS/2354]				LCS	3		E6850Q413Q	5311		3/6/2020	
3	698429	RLVS for HBN 258383 [ELMS/2354				RLVS	3		E685041C3Q	5311		3/6/2020	
4	698430	ICS for HBN 258383 [ELMS/2354]				ICS	3		E6850..D3Q	5311		3/6/2020	
5	698431	LMB for HBN 258383 [ELMS/2354]				LMB	3		E6850Q413Q	5311		3/6/2020	
6	2005502001	LH18/24-SP650_021920_BIX Water				SAMPLE	3	2005502001-A	E6850Q41.3	5480	3/18/2020	3/6/2020	
7	698432	LH18/24-SP650...(2005502001MS)				MS	3		E6850Q413Q	5311		3/6/2020	
8	698433	LH18/24-SP65...(2005502001MSD)				MSD	3		E6850Q413Q	5311		3/6/2020	
9	698434	CCV for HBN 258383 [ELMS/2354]				CCV	3		E685041C3Q	5311		3/6/2020	

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Analytical Documentation

Analyst Write-up

ALS Work Order #'s & Sample #( )'s: 2005502 (001) ELMS Batch/HBN ID: 2354 (258383)
Prep Date: 03/05/2020 Analysis Date: 03/05/2020 Analyst: Tom Bosch
Analyte: **Perchlorate** Matrix: **Water** Method: **6850**
Sequence: \\HPCHEM\1\SEQUENCE\CLO4\2020\MAR\05MAR0D.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 698428; Target = 3.0µg/L. ASTM type II water was used for LMB 698431.

MS/MSD: The Matrix Spike and duplicate (MS/MSD) was performed on sample 2005502001 (Client ID: LH18/24-SP650_021920_BIX Water). 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.
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\2020\MAR\HBN# or through NuGenesis\Tree\PrintData\LCMS\DefaultView.
4) Notebook: \\alsltws013\ORGANIC\BOSCH\LCMS\Perchlorates\Waters\2020\DOD\258383-DoD-ALS-Hstn LCMS4 or through \\ALSLTWS013\DATAREVIEW\HBN#
5) The Reporting Limit Verification Standard (RLVS – 698429) is reported from the analysis of the Laboratory Control Sample (LCS – 698428) 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).

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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 **Batch(es)/SDG:** ELMS. 2354 HBN. 258383 **Sample Set IDs if Applicable:** 2005502	**Analyst Initials**	**Reviewer Initials**
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
MFG: ALS/SLC
MFG Lot: TNB: 09/20/2019
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 09/20/2019 03:09PM

Amount: 10 mL
Expires: 07/25/2020
Usable: Yes
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

S 43659

AccuTrace™ Reference Standard

Catalog No: IC-PER-10X-1
Description: Perchlorate Standard
Element: Perchlorate (ClO_4)
SRM: Ind. Std.
Lot: 218065075
Matrix: Water
Hazards: *Refer to SDS for complete safety information*

Signal Word: None

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

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

ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

ISO Guide 34 Reference Material

Product Number: ICC-013
Lot Number: CP-0860

S 36748

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.

ANAB ACCREDITED ISO GUIDE 34 REFERENCE MATERIAL PRODUCER
ANAB ACCREDITED ACCREDITED TESTING LABORATORY

ISO 9001 Registered Quality System – TUV USA

250 SMITH STREET • NORTH KINGSTOWN, RHODE ISLAND 02852 • WWW.ULTRASCI.COM

ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

TRIPLE ISO CERTIFICATION ULTRA ISO 17025 • ISO GUIDE 34 • ISO 9001

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

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

ANAB ACCREDITED ISO/IEC 17025 TESTING LABORATORY

Cambridge Isotope Laboratories, Inc.

Certificate of Analysis

S 47863

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:	≥ 98%
MW*: * For isotopically labeled compounds, MW listed is for the fully enriched product.	130.44
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.

$NaCl^{18}O_4$

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 ± 1.0 µg/mL (k=2)
Chemical Purity of Neat Material(s)	98%
LC/MS for Concentration	105.4 ± 1.1 µg/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
*	698427 CCV@25	Vial 71	1	Control	1	2.21070e6	7.121	25.73854
*	698428 LCS@3.	Vial 72	1	Control	2	2.20960e5	7.090	2.95454
*	698430 ICS@3.0	Vial 73	1	Control	3	1.36402e5	7.010	2.49054
*	698431 LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
*	2005502001	Vial 75	1	Sample	5	0.00000	0.000	0.00000
*	698432 55021MS	Vial 76	1	Sample	6	1.78783e5	6.918	2.62670
*	698433 55021SD	Vial 77	1	Sample	7	1.75199e5	6.905	2.81591
*	698434 CCV@25	Vial 71	1	Control	8	1.66259e6	7.048	25.17456

#	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
*	698427 CCV@25	Vial 71	1	Control	1	2.92589e5	7.136	5.00000
*	698428 LCS@3.	Vial 72	1	Control	2	2.75116e5	7.104	5.00000
*	698430 ICS@3.0	Vial 73	1	Control	3	2.00879e5	7.025	5.00000
*	698431 LMB	Vial 74	1	Control	4	2.53450e5	7.171	5.00000
*	2005502001	Vial 75	1	Sample	5	2.55503e5	6.954	5.00000
*	698432 55021MS	Vial 76	1	Sample	6	2.49907e5	6.935	5.00000
*	698433 55021SD	Vial 77	1	Sample	7	2.28716e5	6.922	5.00000
*	698434 CCV@25	Vial 71	1	Control	8	2.25499e5	7.061	5.00000

#	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
*	698427 CCV@25	Vial 71	1	Control	1	6.54769e5	7.133	25.06950
*	698428 LCS@3.	Vial 72	1	Control	2	7.38696e4	7.095	3.15111
*	698430 ICS@3.0	Vial 73	1	Control	3	5.02264e4	7.019	2.92589
*	698431 LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
*	2005502001	Vial 75	1	Sample	5	0.00000	0.000	0.00000
*	698432 55021MS	Vial 76	1	Sample	6	6.24609e4	6.945	2.92472
*	698433 55021SD	Vial 77	1	Sample	7	6.13956e4	6.913	3.15029
*	698434 CCV@25	Vial 71	1	Control	8	5.00621e5	7.061	24.88719

*** End of Report ***

Sequence Table:

Method and Injection Info Part:

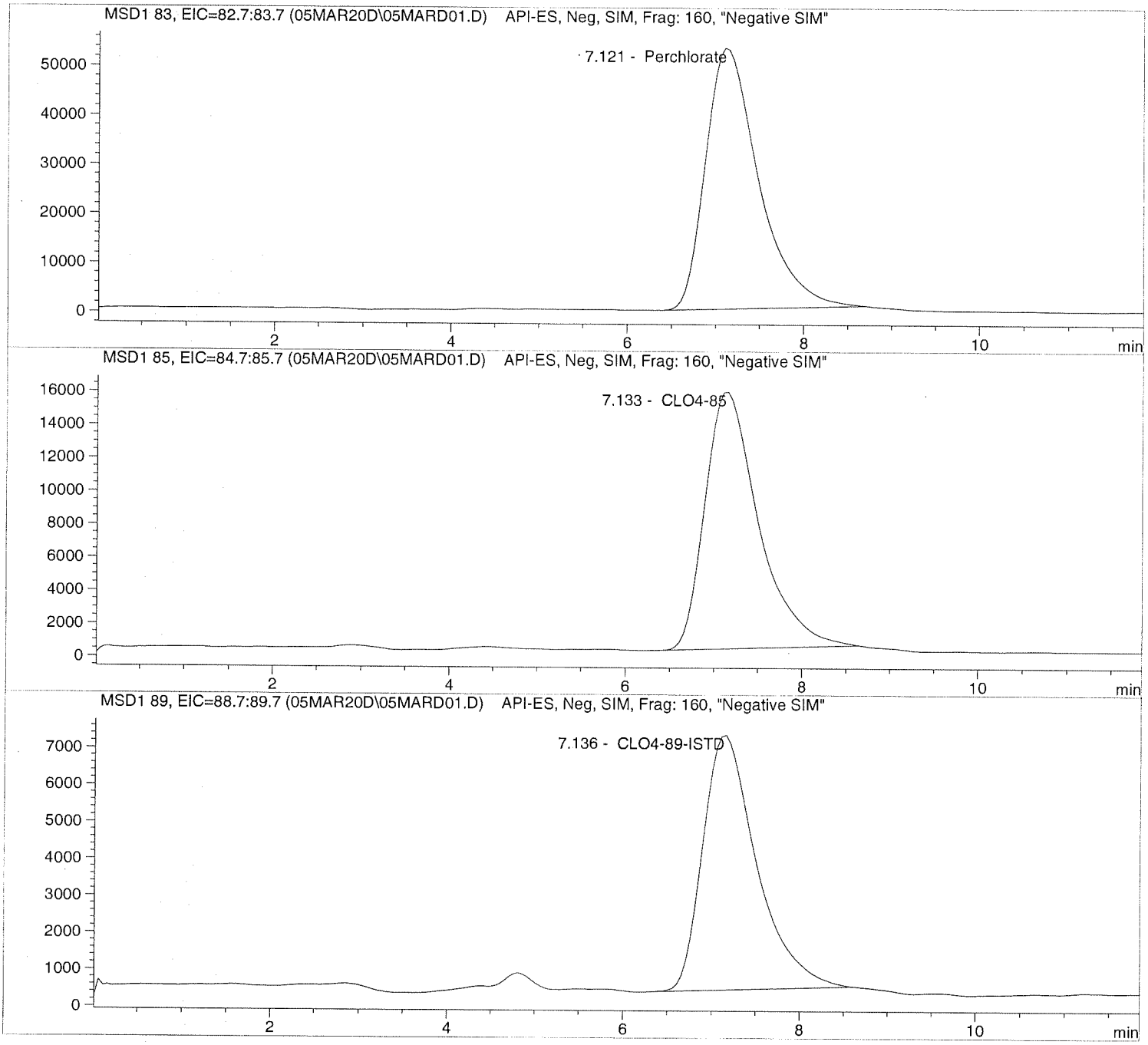
Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
1	Vial 71	698427 CCV@25	CLO4-AQN	1	Ctrl Samp		
2	Vial 72	698428 LCS@3.	CLO4-AQN	1	Ctrl Samp		
3	Vial 73	698430 ICS@3.0	CLO4-AQN	1	Ctrl Samp		
4	Vial 74	698431 LMB	CLO4-AQN	1	Ctrl Samp		
5	Vial 75	2005502001	CLO4-AQN	1	Sample		
6	Vial 76	698432 55021MS	CLO4-AQN	1	Sample		
7	Vial 77	698433 55021SD	CLO4-AQN	1	Sample		
8	Vial 71	698434 CCV@25	CLO4-AQN	1	Ctrl Samp		

Data file: C:\HPCHEM\1\DATA\05MAR20D\05MARD01.D Sample Name: 698427 CCV@25

Injection Date:	3/05/2020 08:37:16	Seq Line:	1
Sample Name:	698427 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: 2/17/2020 15:42:52

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\05MAR20D\05MARD01.D Sample Name: 698427 CCV@25

Injection Date:	3/05/2020 08:37:16	Seq Line:	1
Sample Name:	698427 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: 2/17/2020 15:42:52

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
7.121	PBA	2210698.7	25.7385	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.133	PBA	654769.1	25.0695	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.136	PBA	292588.7	5.0000	CLO4-89-ISTD

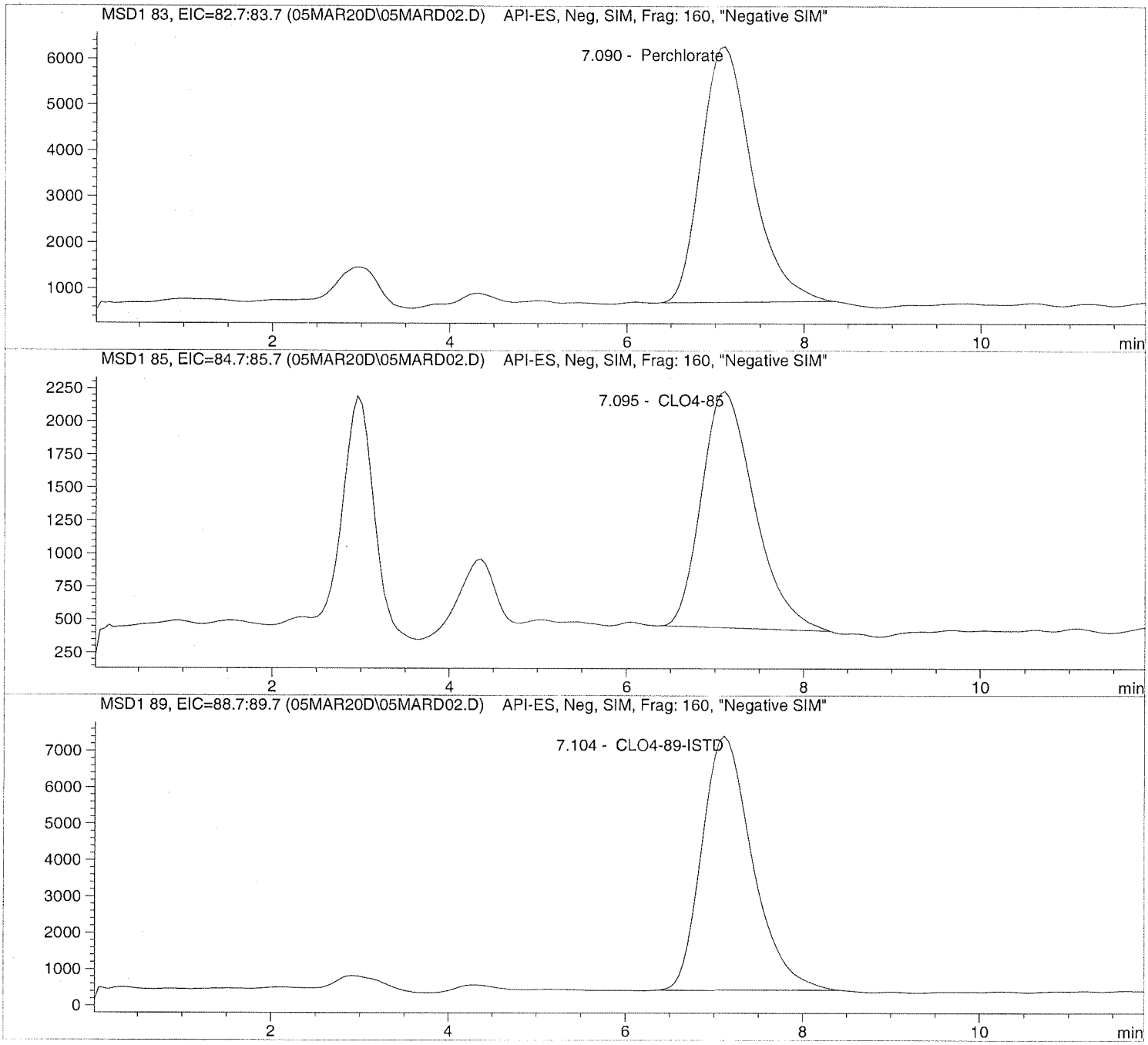
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\05MAR20D\05MARD02.D Sample Name: 698428 LCS@3.

Injection Date:	3/05/2020 08:51:08	Seq Line:	2
Sample Name:	698428 LCS@3.	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: 2/17/2020 15:42:52

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\05MAR20D\05MARD02.D Sample Name: 698428 LCS@3.

Injection Date:	3/05/2020 08:51:08	Seq Line:	2
Sample Name:	698428 LCS@3.	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:	2/17/2020 15:42:52

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
7.090	BBA	220959.8	2.9545	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.095	PBA	73869.6	3.1511	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.104	BBA	275116.3	5.0000	CLO4-89-ISTD

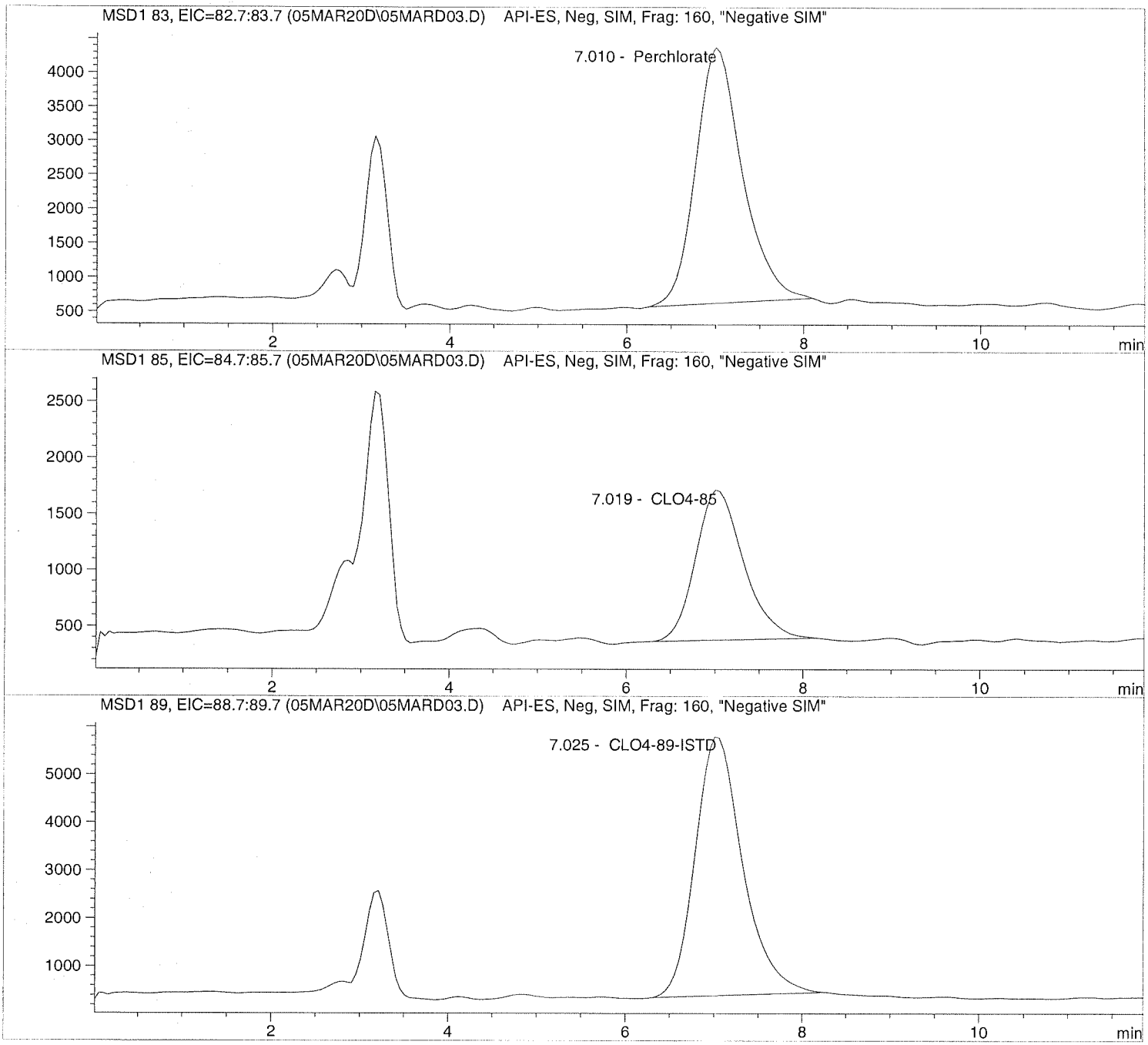
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\05MAR20D\05MARD03.D Sample Name: 698430 ICS@3.0

Injection Date:	3/05/2020 09:05:01	Seq Line:	3
Sample Name:	698430 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: 2/17/2020 15:42:52

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\05MAR20D\05MARD03.D Sample Name: 698430 ICS@3.0

Injection Date:	3/05/2020 09:05:01	Seq Line:	3
Sample Name:	698430 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: 2/17/2020 15:42:52

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
7.010	PBA	136402.5	2.4905	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.019	PBA	50226.4	2.9259	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.025	PBA	200878.6	5.0000	CLO4-89-ISTD

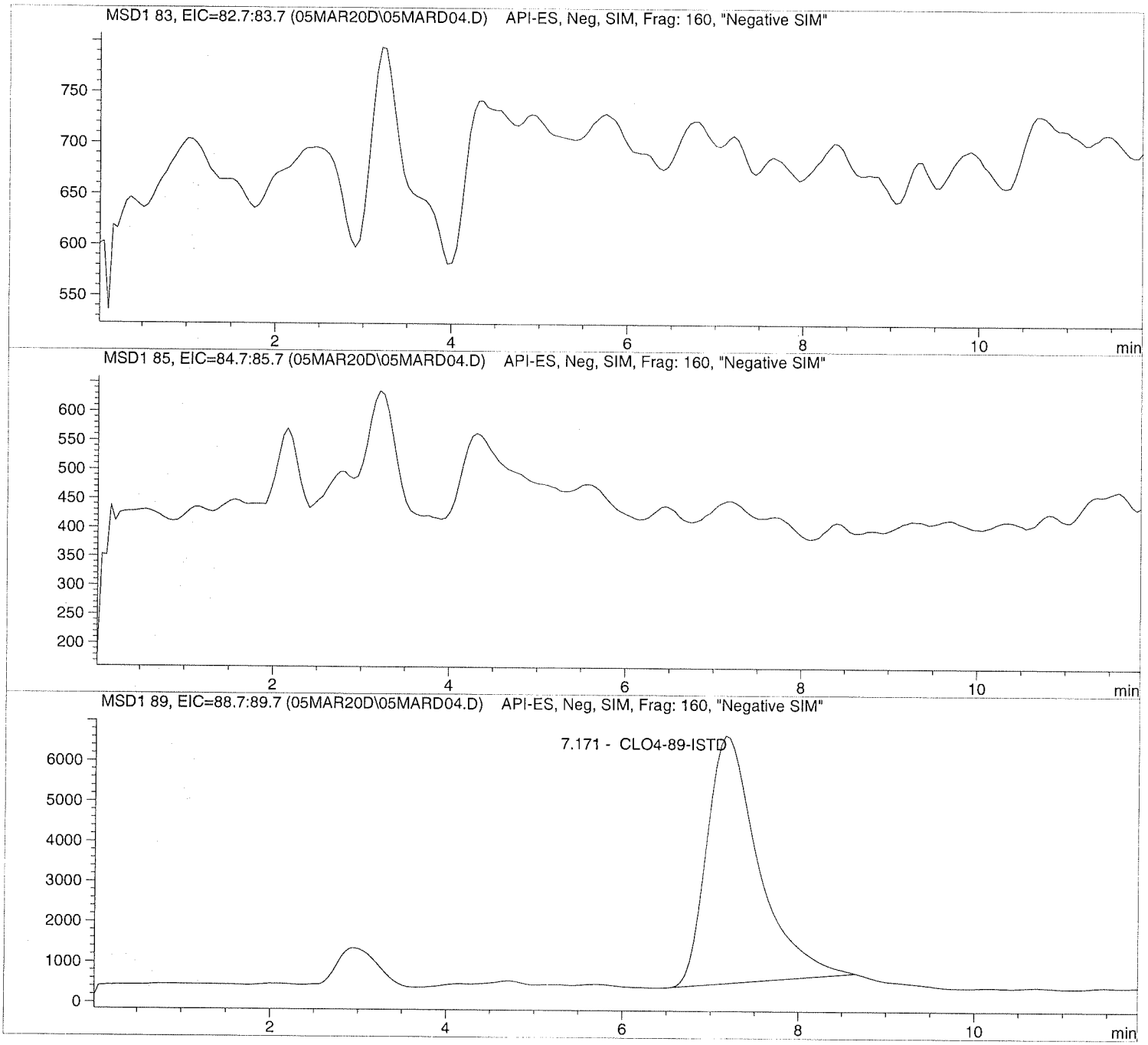
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\05MAR20D\05MARD04.D Sample Name: 698431 LMB

Injection Date:	3/05/2020 09:18:59	Seq Line:	4
Sample Name:	698431 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: 2/17/2020 15:42:52

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\05MAR20D\05MARD04.D Sample Name: 698431 LMB

Injection Date:	3/05/2020 09:18:59	Seq Line:	4
Sample Name:	698431 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: 2/17/2020 15:42:52

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
7.171	PBA	253449.7	5.0000	CLO4-89-ISTD

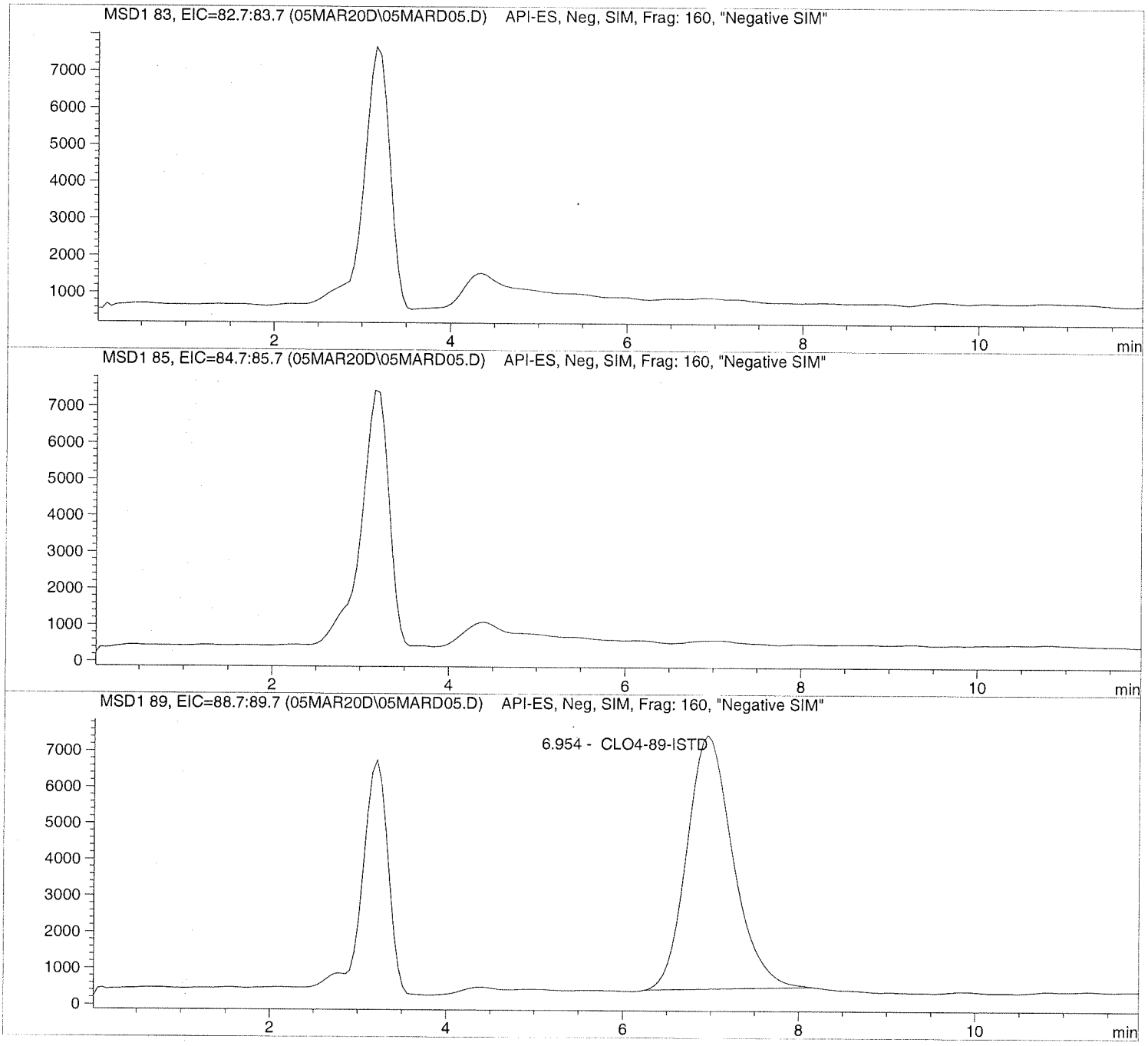
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\05MAR20D\05MARD05.D Sample Name: 2005502001

Injection Date:	3/05/2020 09:32:53	Seq Line:	5
Sample Name:	2005502001	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: 2/17/2020 15:42:52

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\05MAR20D\05MARD05.D Sample Name: 2005502001

Injection Date:	3/05/2020 09:32:53	Seq Line:	5
Sample Name:	2005502001	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: 2/17/2020 15:42:52

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
6.954	PBA	255502.6	5.0000	CLO4-89-ISTD

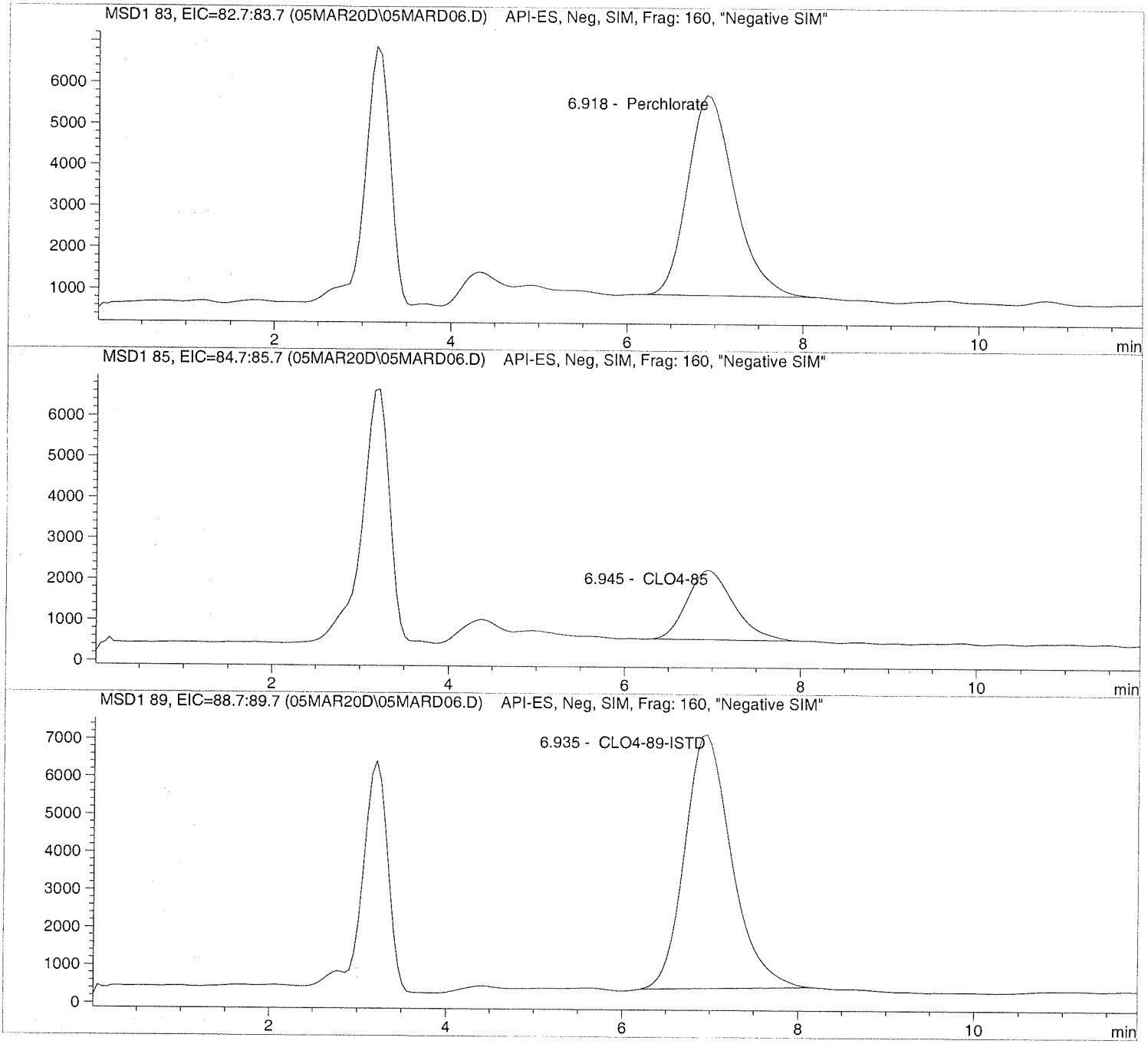
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\05MAR20D\05MARD06.D Sample Name: 698432 55021MS

Injection Date:	3/05/2020 09:46:47	Seq Line:	6
Sample Name:	698432 55021MS	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: 2/17/2020 15:42:52

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\05MAR20D\05MARD06.D Sample Name: 698432 55021MS

Injection Date:	3/05/2020 09:46:47	Seq Line:	6
Sample Name:	698432 55021MS	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: 2/17/2020 15:42:52

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
6.918	PBA	178782.5	2.6267	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.945	PBA	62460.9	2.9247	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.935	PBA	249906.5	5.0000	CLO4-89-ISTD

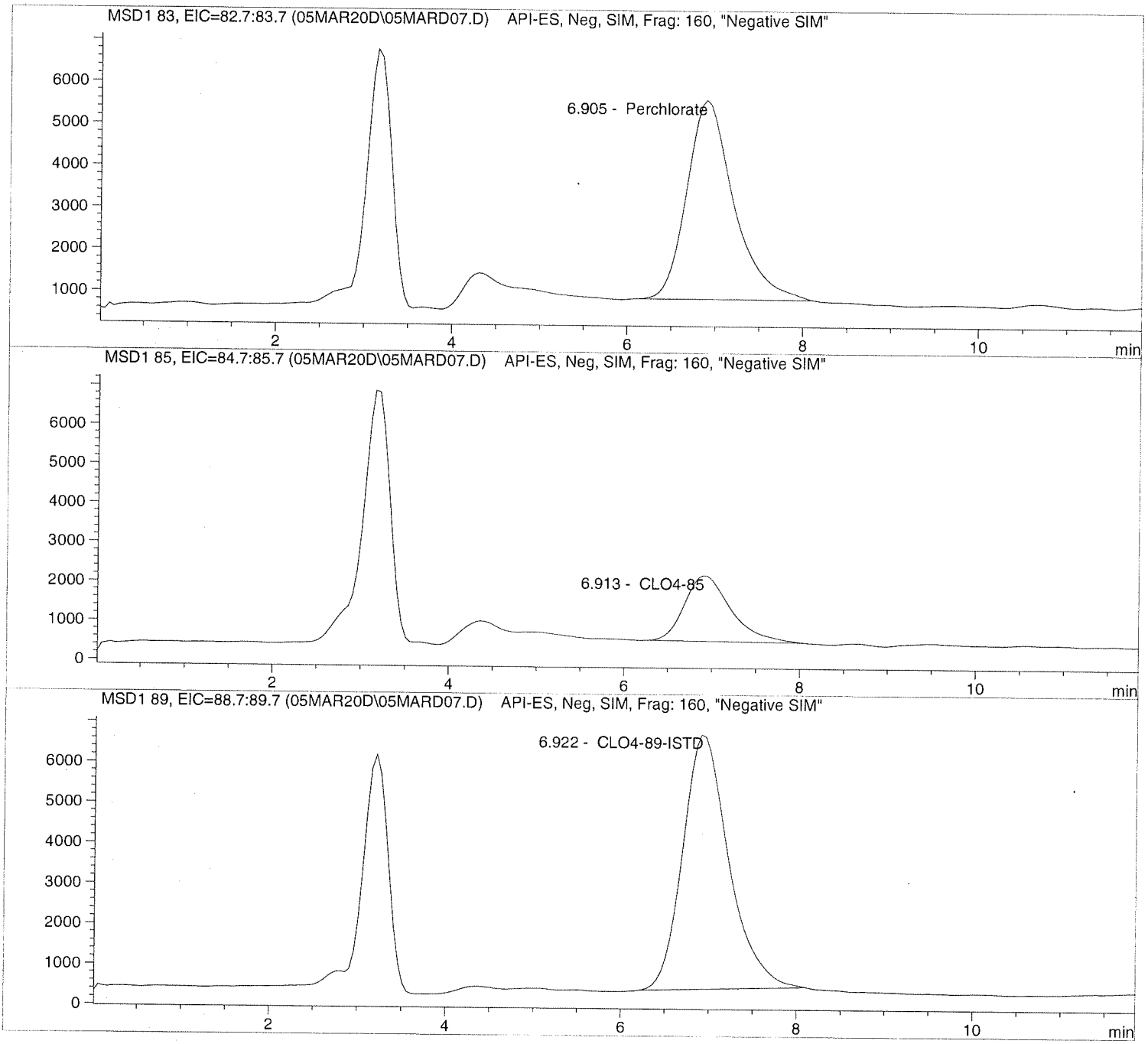
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\05MAR20D\05MARD07.D Sample Name: 698433 55021SD

Injection Date:	3/05/2020 10:01:15	Seq Line:	7
Sample Name:	698433 55021SD	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: 2/17/2020 15:42:52

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\05MAR20D\05MARD07.D Sample Name: 698433 55021SD

Injection Date:	3/05/2020 10:01:15	Seq Line:	7
Sample Name:	698433 55021SD	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:	2/17/2020 15:42:52

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
6.905	BBA	175199.2	2.8159	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.913	PBA	61395.6	3.1503	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.922	PBA	228715.9	5.0000	CLO4-89-ISTD

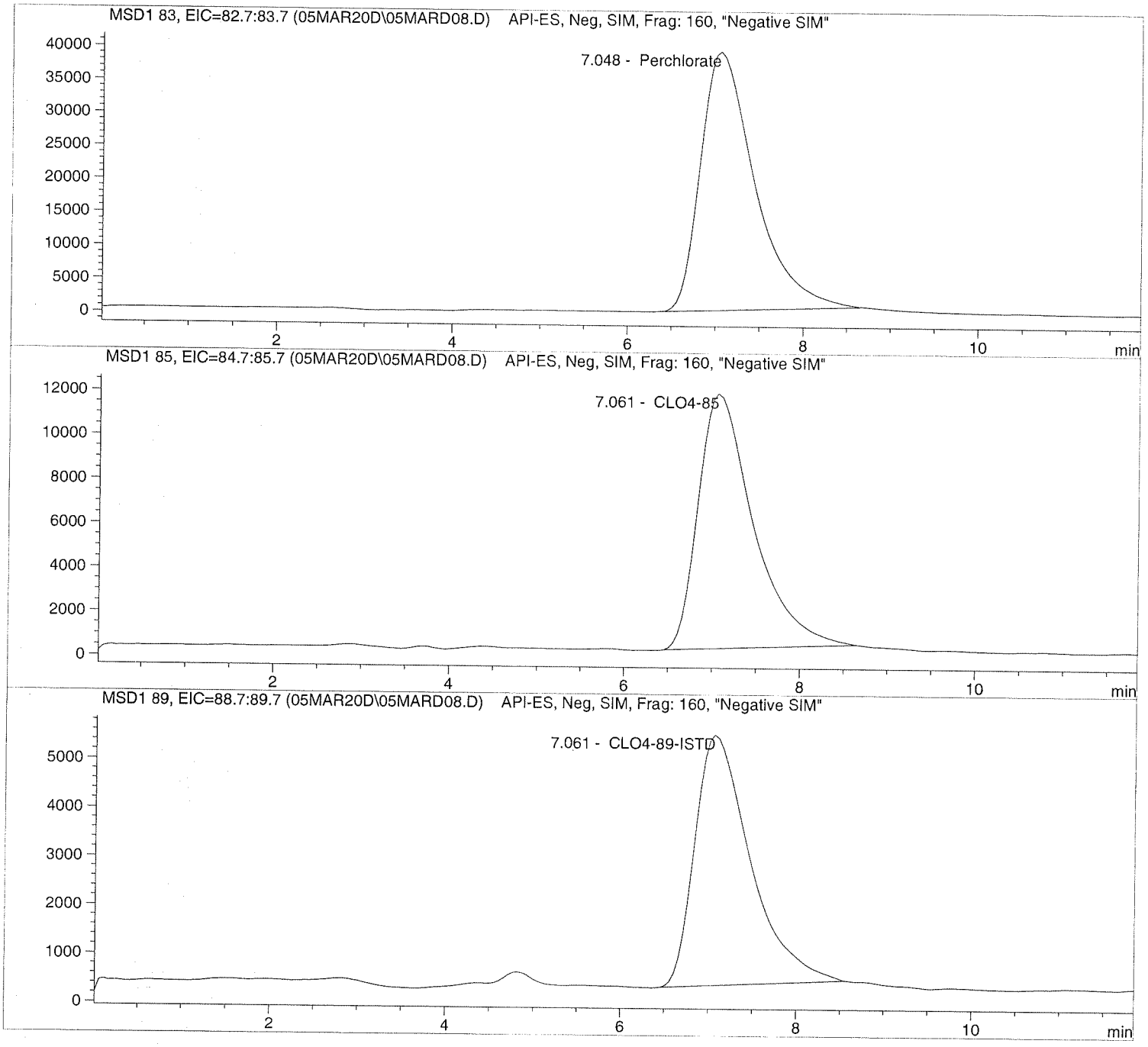
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\05MAR20D\05MARD08.D Sample Name: 698434 CCV@25

Injection Date:	3/05/2020 10:16:30	Seq Line:	8
Sample Name:	698434 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: 2/17/2020 15:42:52

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\05MAR20D\05MARD08.D Sample Name: 698434 CCV@25

Injection Date:	3/05/2020 10:16:30	Seq Line:	8
Sample Name:	698434 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: 2/17/2020 15:42:52

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
7.048	PBA	1662588.4	25.1746	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.061	PBA	500621.5	24.8872	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.061	PBA	225498.7	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]	Sig	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]	Sig	Lvl	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

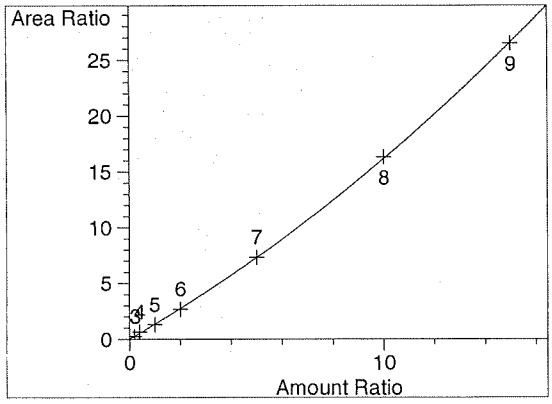
Compound: CLO4-89-ISTD
- Time Window : From 3.581 min To 11.896 min
- Curve Type : Linear
- Origin : Included
- Calibration Level Weights:/
  - Level 3 : 1
  - Level 4 : 1
  - Level 5 : 1
  - Level 6 : 1
  - Level 7 : 1
  - Level 8 : 1
  - Level 9 : 1

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

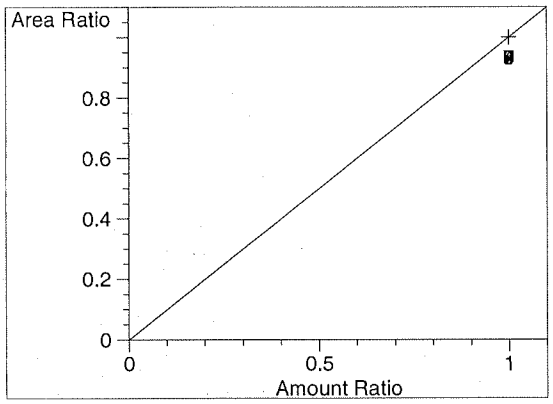
Peak Sum Table

No Entries in table

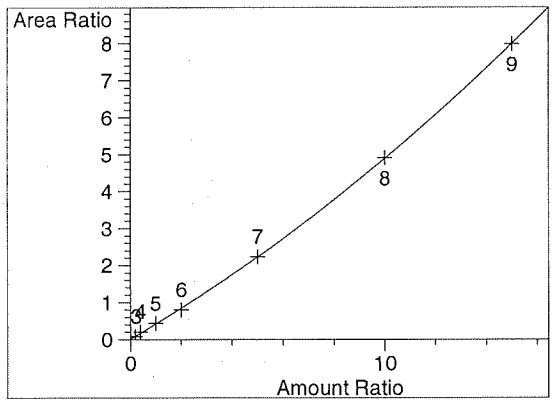
Calibration Curves



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:

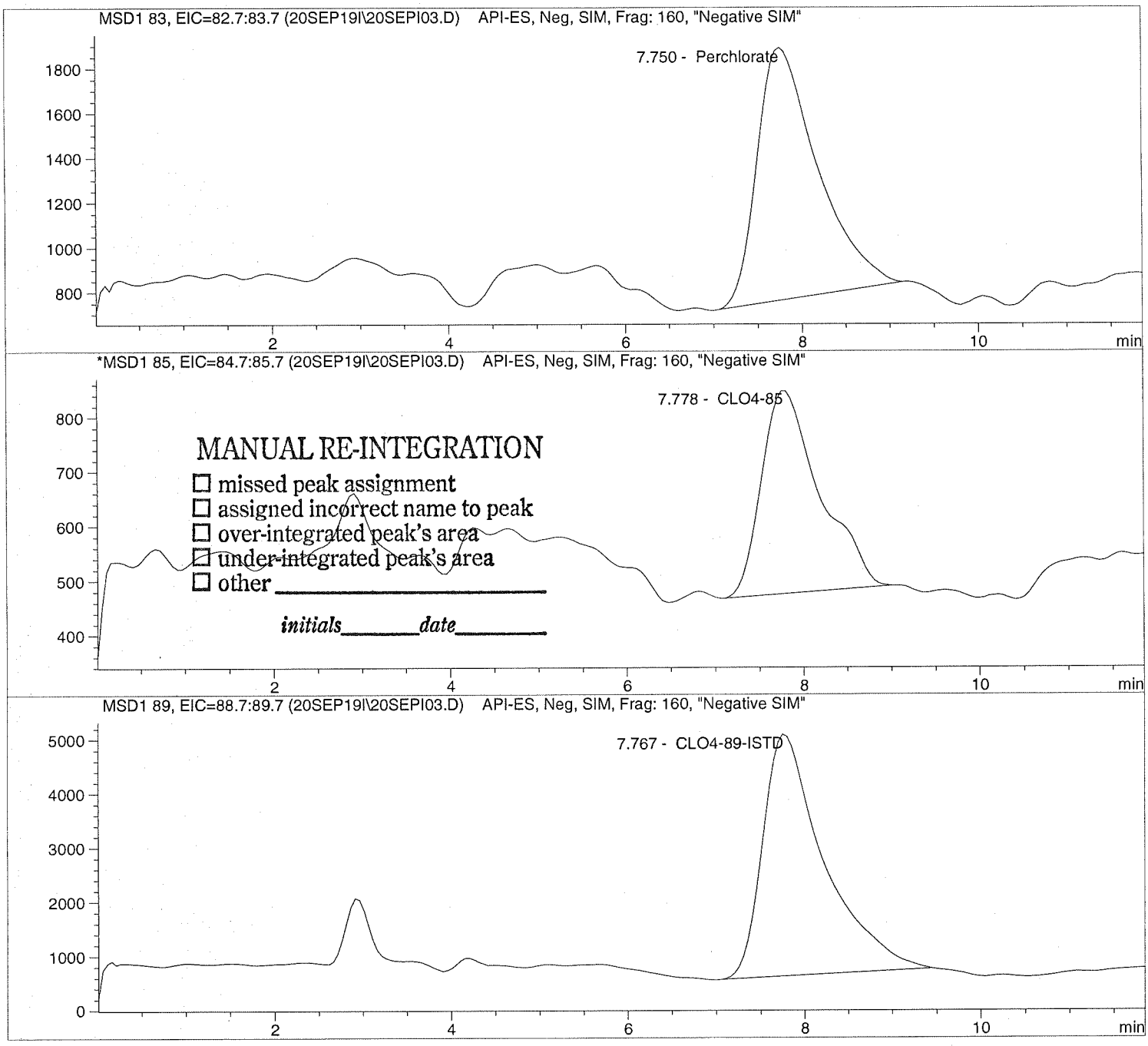
Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
1	Vial 71	CLO4@ 0.2ug/L	CLO4-AQN	1	Ctrl Samp		
2	Vial 72	CLO4@ 0.5ug/L	CLO4-AQN	1	Ctrl Samp		
3	Vial 73	CLO4@ 1.0ug/L	CLO4-AQN	1	Ctrl Samp		
4	Vial 74	CLO4@ 2.0ug/L	CLO4-AQN	1	Ctrl Samp		
5	Vial 75	CLO4@ 5.0ug/L	CLO4-AQN	1	Ctrl Samp		
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

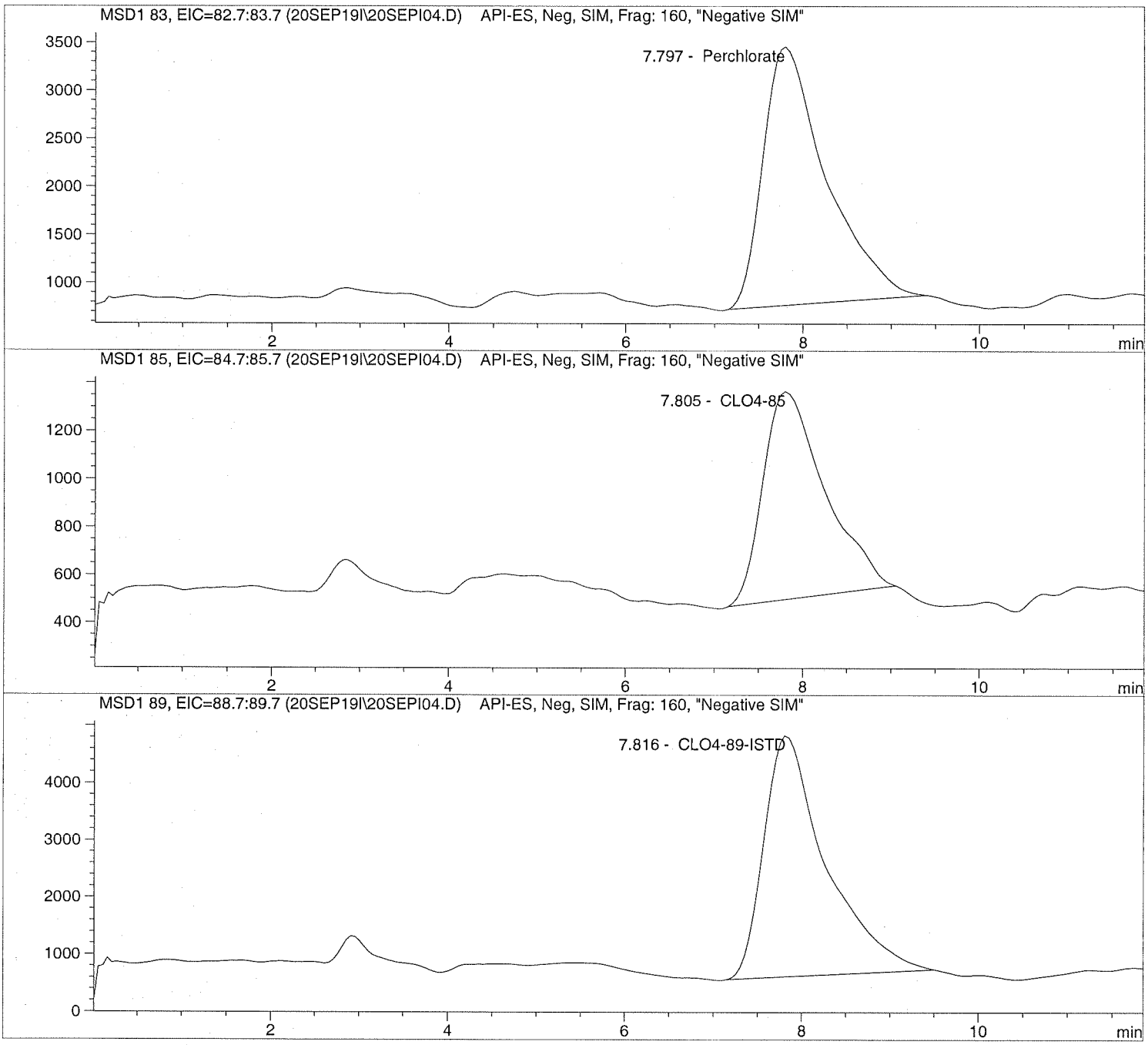
*** End of Report ***

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

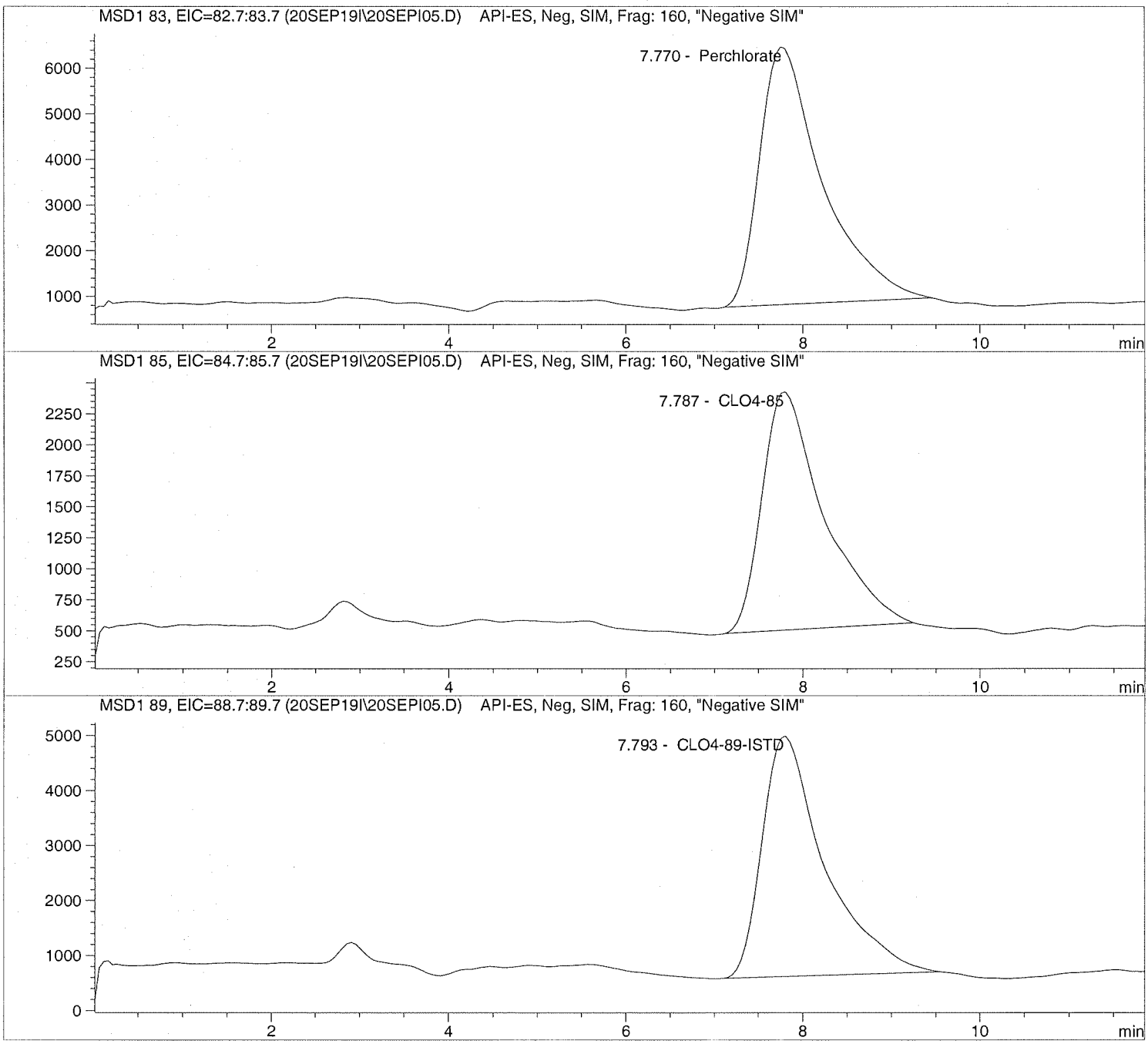
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\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

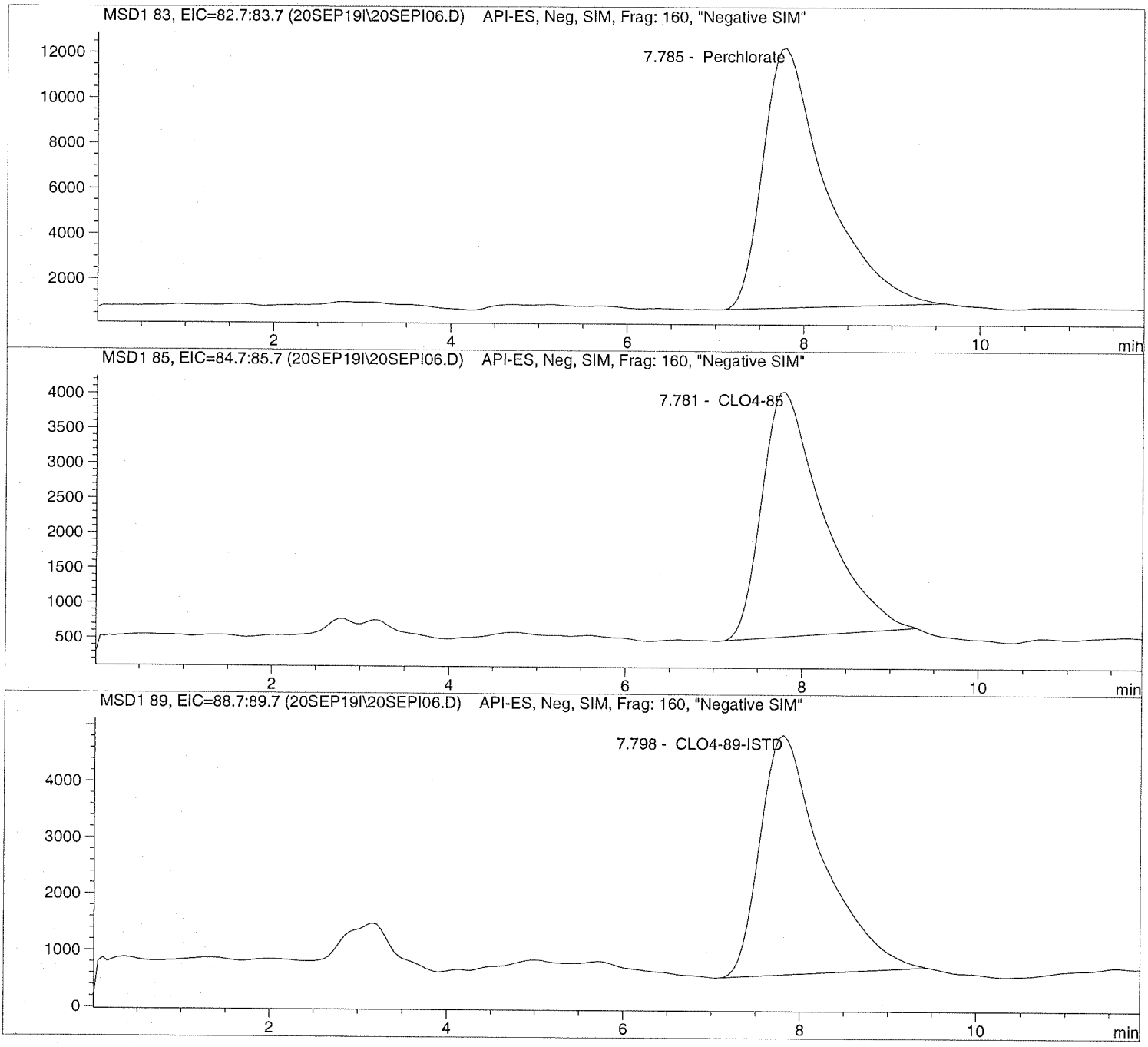
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI06.D Sample Name: CLO4@ 10.ug/L

Injection Date:	9/20/2019 10:05:36	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

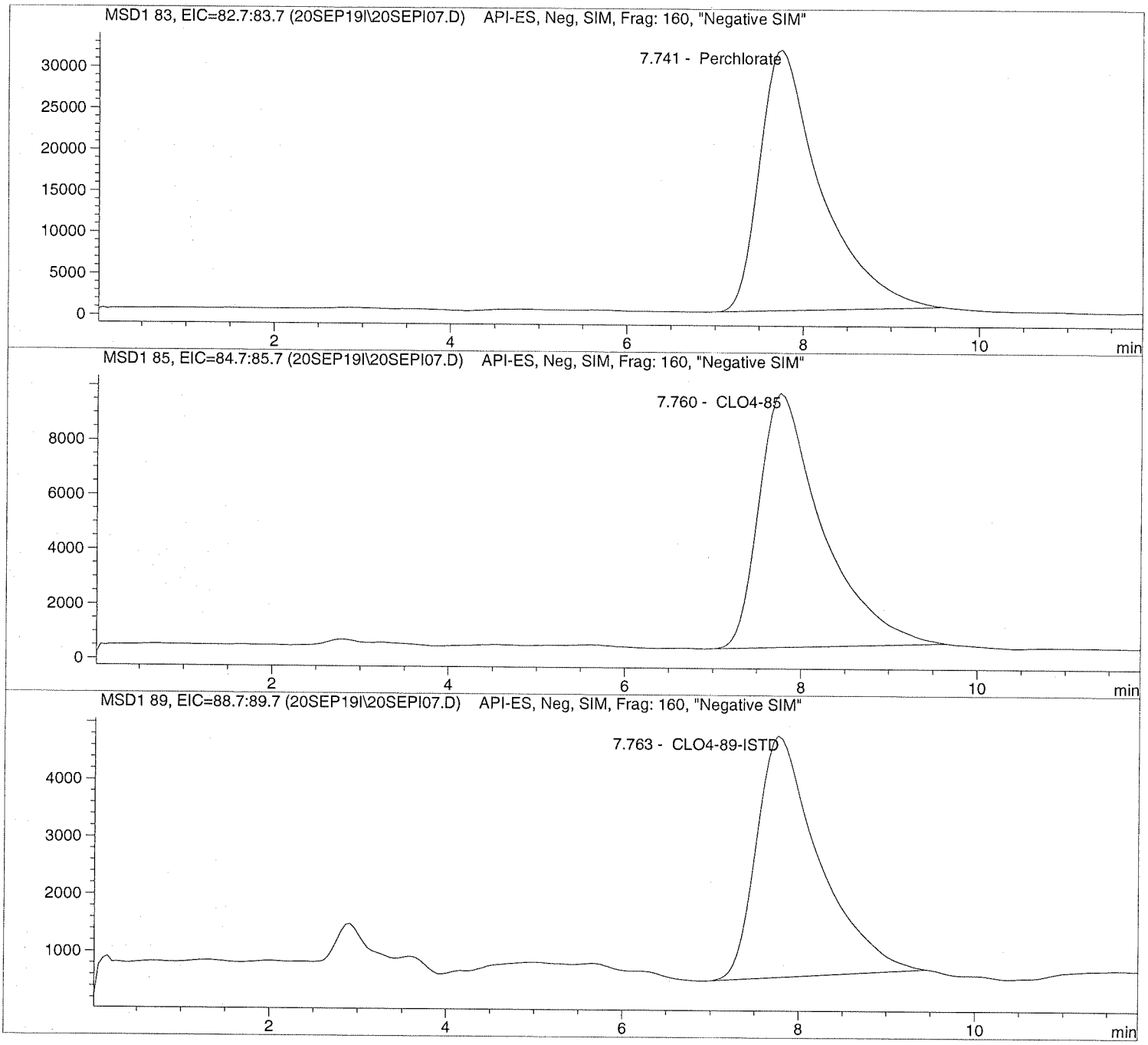
*** End of Report ***

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

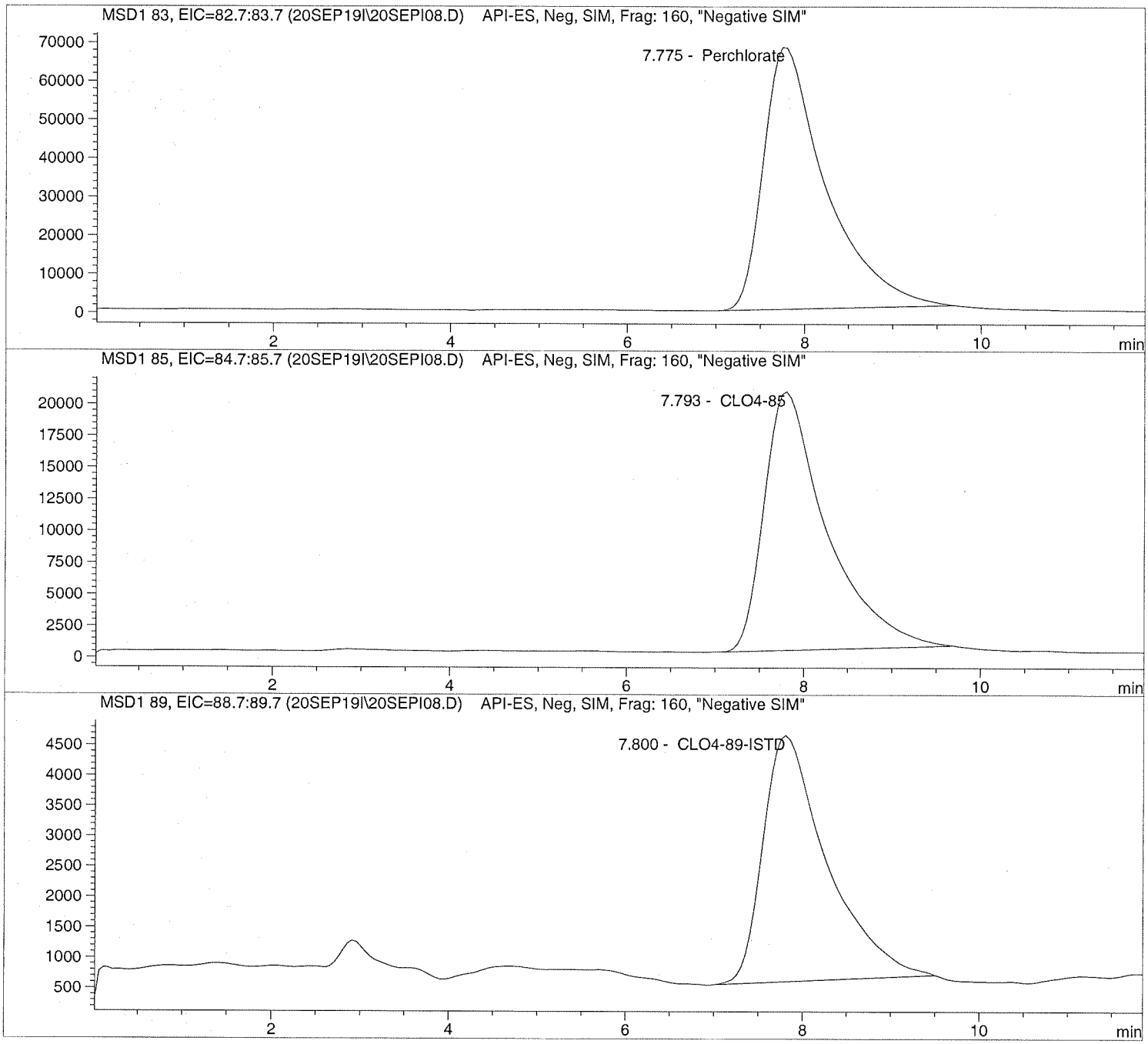
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\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

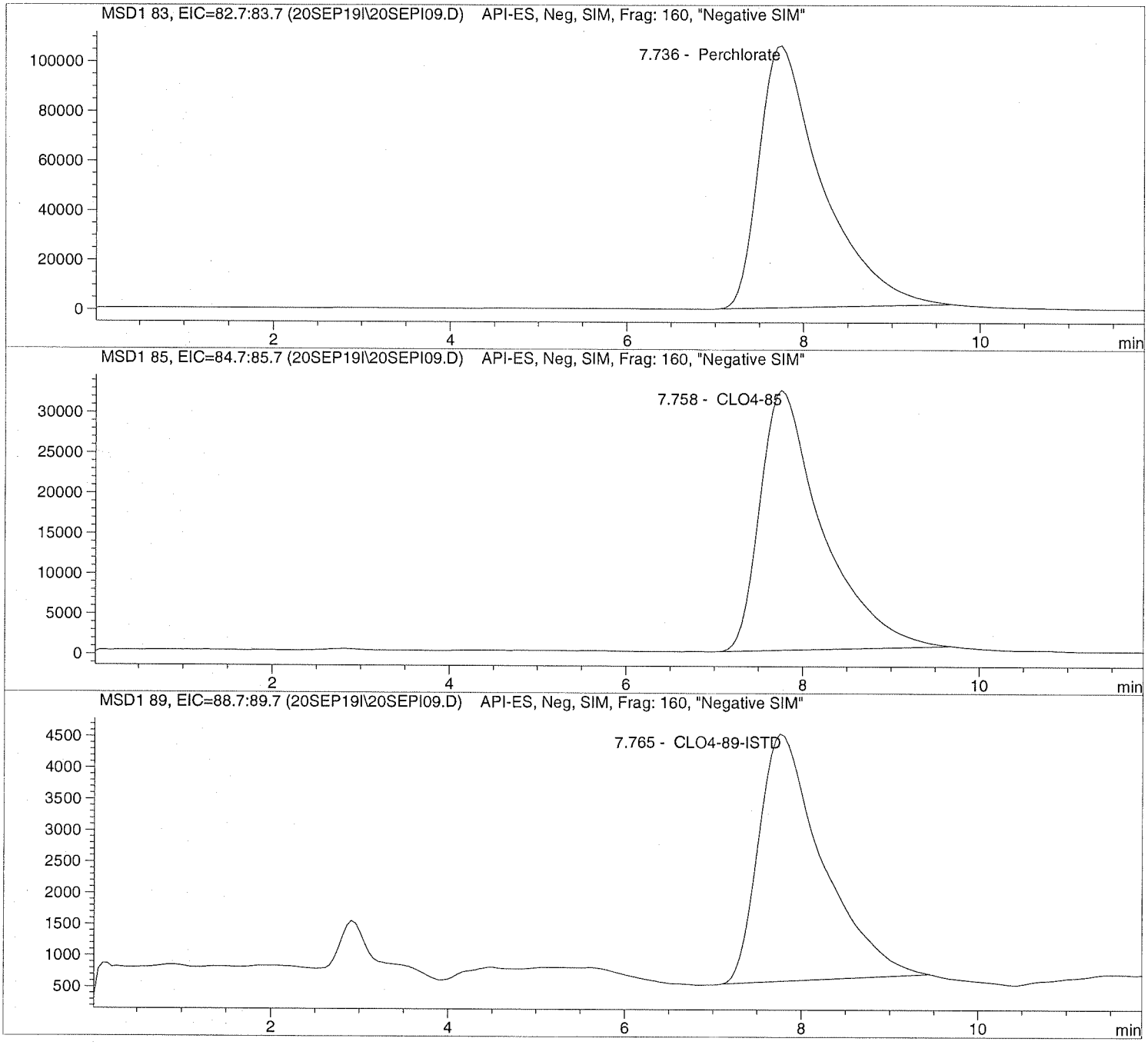
*** End of Report ***

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

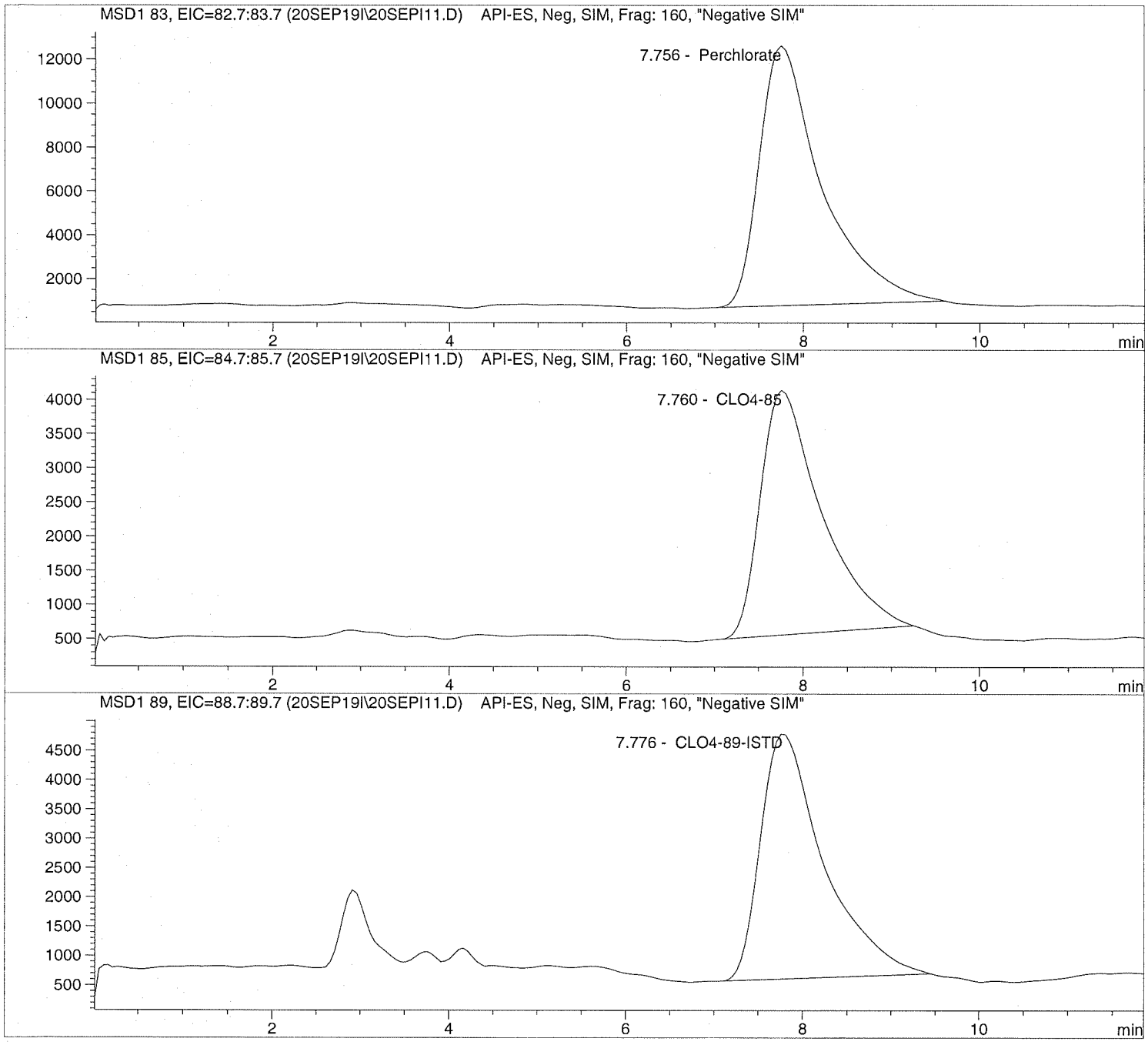
*** End of Report ***

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

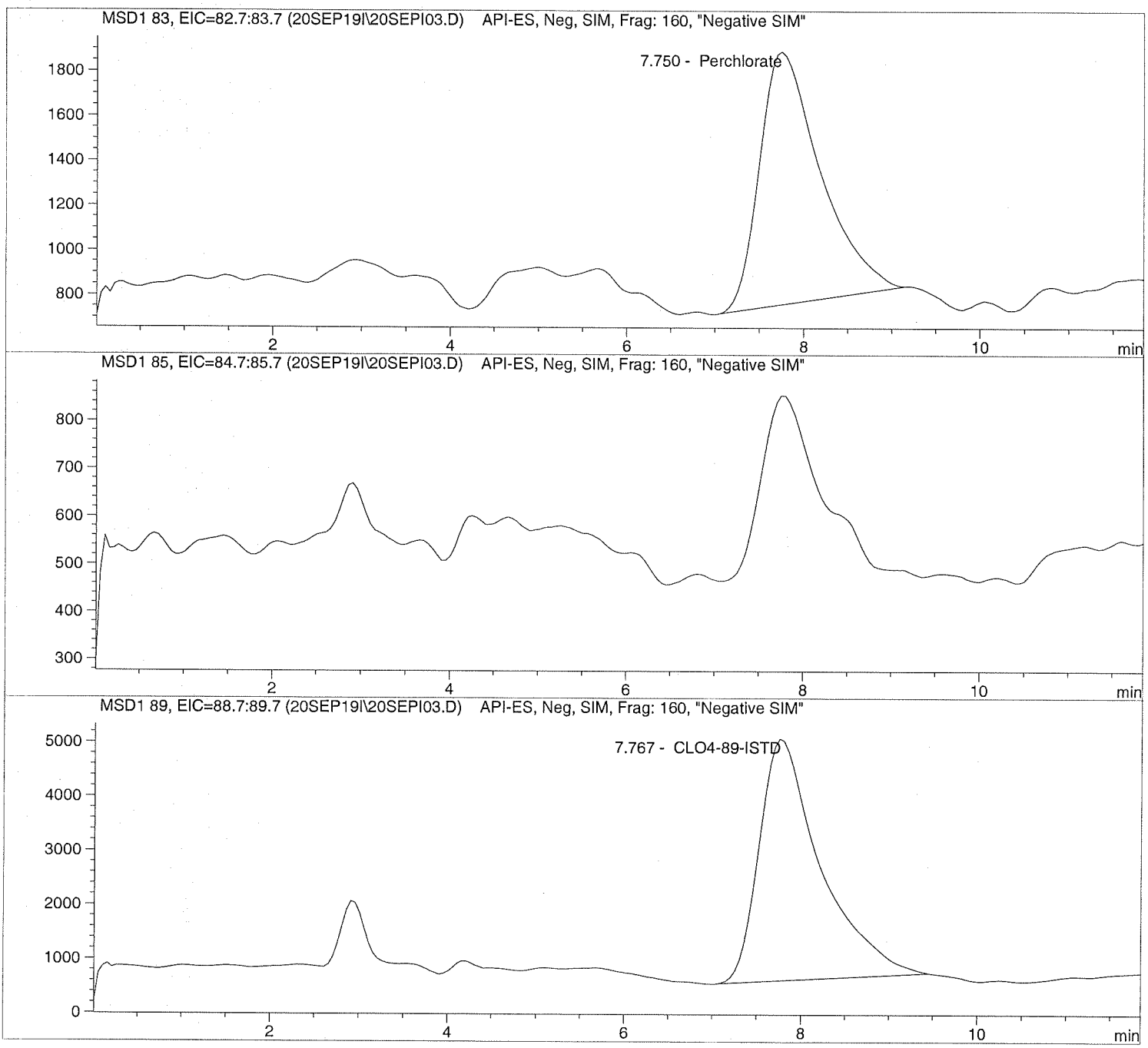
Unmodified

Data file: C:\HPCHEM\1\DATA\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 ***

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February 29, 2020

Analytical Report for Service Request No: K2001599

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

RE: HS20020832

Dear RJ,

Enclosed are the results of the sample(s) submitted to our laboratory February 22, 2020
For your reference, these analyses have been assigned our service request number **K2001599.**

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. All results are intended to be considered in their entirety, and ALS Group USA Corp. dba ALS Environmental (ALS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please contact me if you have any questions. My extension is 3350. You may also contact me via email at Kelley.Lovejoy@alsglobal.com.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Kelley Lovejoy

Kelley Lovejoy
Project Manager

RIGHT SOLUTIONS | RIGHT PARTNER

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Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LOD	Limit of Detection
LOQ	Limit of Quantitation
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

Inorganic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
E	The result is an estimate amount because the value exceeded the instrument calibration range.
J	The result is an estimated value.
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
i	The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
X	See case narrative.
Q	See case narrative. One or more quality control criteria was outside the limits.
H	The holding time for this test is immediately following sample collection. The samples were analyzed as soon as possible after receipt by the laboratory.

Metals Data Qualifiers

#	The control limit criteria is not applicable. See case narrative.
J	The result is an estimated value.
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
M	The duplicate injection precision was not met.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.
S	The reported value was determined by the Method of Standard Additions (MSA).
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
i	The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
X	See case narrative.
+	The correlation coefficient for the MSA is less than 0.995.
Q	See case narrative. One or more quality control criteria was outside the limits.

Organic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
A	A tentatively identified compound, a suspected aldol-condensation product.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
C	The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
D	The reported result is from a dilution.
E	The result is an estimated value.
J	The result is an estimated value.
N	The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
P	The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results.
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
i	The MRL/MDL or LOQ/LOD is elevated due to a chromatographic interference.
X	See case narrative.
Q	See case narrative. One or more quality control criteria was outside the limits.

Additional Petroleum Hydrocarbon Specific Qualifiers

F	The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
L	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
H	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
O	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
Y	The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
Z	The chromatographic fingerprint does not resemble a petroleum product.

ALS Group USA Corp. dba ALS Environmental (ALS) - Kelso
State Certifications, Accreditations, and Licenses

Agency	Web Site	Number
Alaska DEH	http://dec.alaska.gov/eh/lab/cs/csapproval.htm	UST-040
Arizona DHS	http://www.azdhs.gov/lab/license/env.htm	AZ0339
Arkansas - DEQ	http://www.adeq.state.ar.us/techsvs/labcert.htm	88-0637
California DHS (ELAP)	http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx	2795
DOD ELAP	http://www.denix.osd.mil/edqw/Accreditation/AccreditedLabs.cfm	L16-58-R4
Florida DOH	http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm	E87412
Hawaii DOH	http://health.hawaii.gov/	-
ISO 17025	http://www.pjlabs.com/	L16-57
Louisiana DEQ	http://www.deq.louisiana.gov/page/la-lab-accreditation	03016
Maine DHS	http://www.maine.gov/dhhs/	WA01276
Minnesota DOH	http://www.health.state.mn.us/accreditation	053-999-457
Nevada DEP	http://ndep.nv.gov/bsdw/labservice.htm	WA01276
New Jersey DEP	http://www.nj.gov/dep/enforcement/oqa.html	WA005
New York - DOH	https://www.wadsworth.org/regulatory/elap	12060
North Carolina DEQ	https://deq.nc.gov/about/divisions/water-resources/water-resources-data/water-sciences-home-page/laboratory-certification-branch/non-field-lab-certification	605
Oklahoma DEQ	http://www.deq.state.ok.us/CSDnew/labcert.htm	9801
Oregon – DEQ (NELAP)	http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	WA100010
South Carolina DHEC	http://www.scdhec.gov/environment/EnvironmentalLabCertification/	61002
Texas CEQ	http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html	T104704427
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C544
Wyoming (EPA Region 8)	https://www.epa.gov/region8-waterops/epa-region-8-certified-drinking-water-	-
Kelso Laboratory Website	www.alsglobal.com	NA

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. A complete listing of specific NELAP-certified analytes, can be found in the certification section at www.ALSGlobal.com or at the accreditation bodies web site.
Please refer to the certification and/or accreditation body's web site if samples are submitted for compliance purposes. The states highlighted above, require the analysis be listed on the state certification if used for compliance purposes and if the method/anlayte is offered by that state.

Case Narrative

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ALS Environmental

Client: ALS Environmental - US
Project: HS20020832
Sample Matrix: Water

Service Request: K2001599
Date Received: 02/22/2020

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:

One water sample was received for analysis at ALS Environmental on 02/22/2020. Any discrepancies upon initial sample inspection are annotated on the sample receipt and preservation form included within this report. The sample was stored at minimum in accordance with the analytical method requirements.

General Chemistry:

No significant anomalies were noted with this analysis.

Approved by Kelley Lovejoy Date 02/29/2020

Chain of Custody

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K2001599

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Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID:** **13371**

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:	HS20020832
TSR:	Danielle Winnings

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS20020832-01**	**LH18/24-SP650_021920**	**Water**	**19 Feb 2020 14:00**
	TOC Analysis for DOD Level IV			28 Feb 2020

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. Modashia Date/Time: 2/21/20 18:00

Received By: K Monow ALS Kelso Date/Time: 2/22/20 0910

Cooler ID(s): Temperature(s):

PC KL

Cooler Receipt and Preservation Form

Client ALS-Houston Service Request K20 01599

Received: 2/22/20 Opened: 2/22/20 By: KM Unloaded: 2/22/20 By: KM

1. Samples were received via? *USPS* (*Fed Ex*) *UPS* *DHL* *PDX* *Courier* *Hand Delivered*
2. Samples were received in: (circle) (*Cooler*) *Box* *Envelope* *Other* _____ *NA*
3. Were custody seals on coolers? NA (Y) N If yes, how many and where? 1 Ex 1 B
   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	File
3.8	3.8	1.0	1.0	0	385	13371	1251 0294 7211	

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

Sample ID on Bottle	Sample ID on COC	Identified by:

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

Notes, Discrepancies, & Resolutions: _____

General Chemistry

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www.alsglobal.com

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	K2001599
Project:	HS20020832	**Date Collected:**	02/19/20
Sample Matrix:	Water	**Date Received:**	02/22/20
Analysis Method:	SM 5310 C	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA

Carbon, Total Organic

Sample Name	Lab Code	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
LH18/24-SP650_021920	K2001599-001	**1.71**	0.50	0.07	1	02/27/20 13:40	
Method Blank	K2001599-MB	ND U	0.50	0.07	1	02/27/20 04:00	

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	K2001599
Project	HS20020832	**Date Collected:**	02/19/20
Sample Matrix:	Water	**Date Received:**	02/22/20
		Date Analyzed:	02/27/20

Replicate Sample Summary
General Chemistry Parameters

Sample Name:	LH18/24-SP650_021920	**Units:**	mg/L
Lab Code:	K2001599-001	**Basis:**	NA

Analyte Name	Analysis Method	LOD	MDL	LOQ	Duplicate Sample K2001599-001DUP Result	Average	RPD	RPD Limit
Carbon, Total Organic	SM 5310 C	0.50	0.07	1.71	1.77	1.74	3	10

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

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

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

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	K2001599
Project:	HS20020832	**Date Analyzed:**	02/27/20
Sample Matrix:	Water	**Date Extracted:**	NA

Lab Control Sample Summary
Carbon, Total Organic

Analysis Method:	SM 5310 C	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA
		Analysis Lot:	671330

Sample Name	Lab Code	Result	Spike Amount	% Rec	% Rec Limits
Lab Control Sample	K2001599-LCS	26.6	25.0	106	83-117

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US **Service Request:** K2001599
Project: HS20020832

Continuing Calibration Verification (CCV) Summary

Carbon, Total Organic

Analysis Method: SM 5310 C **Units:** mg/L

	Analysis Lot	Lab Code	Date Analyzed	True Value	Measured Value	Percent Recovery	Acceptance Limits
CCV1	671330	KQ2002703-02	02/26/20 17:10	25.0	24.8	99	90-110
CCV2	671330	KQ2002703-03	02/26/20 22:03	25.0	24.6	98	90-110
CCV3	671330	KQ2002703-10	02/27/20 08:50	25.0	24.1	96	90-110
CCV4	671330	KQ2002703-11	02/27/20 14:12	25.0	24.1	97	90-110

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US **Service Request:**K2001599
Project: HS20020832

Continuing Calibration Blank (CCB) Summary
Carbon, Total Organic

Analysis Method: SM 5310 C **Units:**mg/L

	Analysis Lot	Lab Code	Date Analyzed	MRL	MDL	Result	Q
CCB1	671330	KQ2002703-04	02/26/20 17:27	0.50	0.07	ND	U
CCB2	671330	KQ2002703-05	02/26/20 22:19	0.50	0.07	ND	U
CCB3	671330	KQ2002703-12	02/27/20 09:06	0.50	0.07	ND	U
CCB4	671330	KQ2002703-13	02/27/20 14:29	0.50	0.07	ND	U

Raw Data

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General Chemistry

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Work Request # Original ( ) K2001451, 1512, 1530, 1546, 1556, 1573, 1555, 1579, 1579, 1514, 1521, 1554, 1579, 1591, 1599

Tier: II II V I IV II IV II II IV II II II IV IV

Date Analyzed: 2/25/2020

Analyst: BDD

Analysis: TOC

TOC: 671032, 671033, 671034

Run # 671330

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: K2001451-8MS reports a low parent recovery suspected due to salt water sample.
K2001451-1/1d, 11/11d, 12/12d, 13/13d, 1546-2/2d, 1530-18/18d report a high %RSD. However these samples are less than 5x the MRL.
K2001556-1/1d report a high %RSD due to suspected non-homogenous triplicate sample.

Final Approved by: _____ Date: 2/28/20

DQREPORT

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 671032 **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
K2001451-001	Carbon, Total Organic	N/A		Brackish Water	1.38 mg/L	10 ml	2.8 mg/L	2	0.2	1.0			2/25/20 22:52	N	II
K2001451-002	Carbon, Total Organic	N/A		Brackish Water	2.27 mg/L	10 ml	4.5 mg/L	2	0.2	1.0			2/25/20 23:24	N	II
K2001451-003	Carbon, Total Organic	N/A		Brackish Water	0.47 mg/L	10 ml	0.9 mg/L J	2	0.2	1.0			2/25/20 23:56	N	II
K2001451-004	Carbon, Total Organic	N/A		Brackish Water	0.71 mg/L	10 ml	1.4 mg/L	2	0.2	1.0			2/26/20 00:28	N	II
K2001451-005	Carbon, Total Organic	N/A		Brackish Water	20.46 mg/L	10 ml	40.9 mg/L	2	0.2	1.0			2/26/20 01:33	N	II
K2001451-006	Carbon, Total Organic	N/A		Brackish Water	0.88 mg/L	10 ml	1.8 mg/L	2	0.2	1.0			2/26/20 02:05	N	II
K2001451-007	Carbon, Total Organic	N/A		Brackish Water	0.66 mg/L	10 ml	1.3 mg/L	2	0.2	1.0			2/26/20 02:38	N	II
K2001451-008	Carbon, Total Organic	N/A		Brackish Water	0.30 mg/L	10 ml	0.6 mg/L J	2	0.2	1.0			2/26/20 03:10	Y	II
K2001451-009	Carbon, Total Organic	N/A		Brackish Water	0.46 mg/L	10 ml	0.9 mg/L J	2	0.2	1.0			2/26/20 04:15	N	II
K2001451-010	Carbon, Total Organic	N/A		Brackish Water	8.28 mg/L	10 ml	16.6 mg/L	2	0.2	1.0			2/26/20 04:47	N	II
K2001451-011	Carbon, Total Organic	N/A		Brackish Water	2.25 mg/L	10 ml	4.5 mg/L	2	0.2	1.0			2/26/20 05:19	N	II
K2001451-012	Carbon, Total Organic	N/A		Brackish Water	0.41 mg/L	10 ml	0.8 mg/L J	2	0.2	1.0			2/26/20 05:51	N	II
K2001451-013	Carbon, Total Organic	N/A		Brackish Water	0.34 mg/L	10 ml	0.7 mg/L J	2	0.2	1.0			2/26/20 07:30	N	II
K2001512-001	Carbon, Total Organic	N/A		Water	1.08 mg/L	10 ml	1.08 mg/L	1	0.07	0.50			2/25/20 21:47	N	II
K2001530-001	Carbon, Total Organic	N/A		Water	1.79 mg/L	10 ml	1.79 mg/L	1	0.07	0.50			2/26/20 09:06	N	V
K2001530-002	Carbon, Total Organic	N/A		Water	1.08 mg/L	10 ml	1.08 mg/L	1	0.07	0.50			2/26/20 09:38	N	V
K2001530-003	Carbon, Total Organic	N/A		Water	0.67 mg/L	10 ml	0.67 mg/L	1	0.07	0.50			2/26/20 10:10	N	V
K2001546-002	Carbon, Total Organic	N/A		Drinking Water	0.63 mg/L	10 ml	0.63 mg/L	1	0.07	0.50			2/26/20 08:02	N	I
K2001556-001	Carbon, Total Organic	N/A		Water	13.76 mg/L	10 ml	13.8 mg/L	1	0.07	0.50			2/25/20 22:19	N	IV
K2001573-001	Carbon, Total Organic	N/A		Water	5.35 mg/L	10 ml	5.35 mg/L	1	0.07	0.50			2/26/20 08:34	N	II
KQ2002694-01	Carbon, Total Organic	MS	K2001451-008	Brackish Water	16.16 mg/L	10 ml	32.3 mg/L	2	0.2	1.0	63*		2/26/20 03:42	N	II
KQ2002694-02	Carbon, Total Organic	DUP	K2001451-001	Brackish Water	1.00 mg/L	10 ml	2.0 mg/L	2	0.2	1.0		32*	2/25/20 22:52	N	II
KQ2002694-03	Carbon, Total Organic	DUP	K2001451-002	Brackish Water	2.25 mg/L	10 ml	4.5 mg/L	2	0.2	1.0		<1	2/25/20 23:24	N	II
KQ2002694-04	Carbon, Total Organic	DUP	K2001451-010	Brackish Water	8.32 mg/L	10 ml	16.6 mg/L	2	0.2	1.0		<1	2/26/20 04:47	N	II
KQ2002694-05	Carbon, Total Organic	DUP	K2001451-011	Brackish Water	1.90 mg/L	10 ml	3.8 mg/L	2	0.2	1.0		17*	2/26/20 05:19	N	II
KQ2002694-06	Carbon, Total Organic	DUP	K2001451-003	Brackish Water	0.49 mg/L	10 ml	1.0 mg/L J	2	0.2	1.0		3	2/25/20 23:56	N	II
KQ2002694-07	Carbon, Total Organic	DUP	K2001451-004	Brackish Water	0.72 mg/L	10 ml	1.4 mg/L	2	0.2	1.0		2	2/26/20 00:28	N	II
KQ2002694-08	Carbon, Total Organic	DUP	K2001451-005	Brackish Water	20.82 mg/L	10 ml	41.6 mg/L	2	0.2	1.0		2	2/26/20 01:33	N	II

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

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 671032 **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
KQ2002694-09	Carbon, Total Organic	DUP	K2001451-006	Brackish Water	0.80 mg/L	10 ml	1.6 mg/L	2	0.2	1.0		9	2/26/20 02:05	N	II
KQ2002694-10	Carbon, Total Organic	DUP	K2001451-007	Brackish Water	0.66 mg/L	10 ml	1.3 mg/L	2	0.2	1.0		<1	2/26/20 02:38	N	II
KQ2002694-11	Carbon, Total Organic	DUP	K2001451-008	Brackish Water	0.32 mg/L	10 ml	0.6 mg/L J	2	0.2	1.0		6	2/26/20 03:10	N	II
KQ2002694-12	Carbon, Total Organic	DUP	K2001451-009	Brackish Water	0.48 mg/L	10 ml	1.0 mg/L J	2	0.2	1.0		5	2/26/20 04:15	N	II
KQ2002694-13	Carbon, Total Organic	DUP	K2001451-012	Brackish Water	0.37 mg/L	10 ml	0.7 mg/L J	2	0.2	1.0		12*	2/26/20 05:51	N	II
KQ2002694-14	Carbon, Total Organic	DUP	K2001451-013	Brackish Water	0.22 mg/L	10 ml	0.4 mg/L J	2	0.2	1.0		42*	2/26/20 07:30	N	II
KQ2002694-15	Carbon, Total Organic	CCV		Water	25.37 mg/L	10 ml	25.4 mg/L	1					2/25/20 20:07	N	II
KQ2002694-16	Carbon, Total Organic	CCV		Water	25.54 mg/L	10 ml	25.5 mg/L	1					2/26/20 01:00	N	II
KQ2002694-17	Carbon, Total Organic	CCV		Water	25.40 mg/L	10 ml	25.4 mg/L	1					2/26/20 06:23	N	II
KQ2002694-19	Carbon, Total Organic	CCB		Water	0.29 mg/L	10 ml	0.29 mg/L J	1	0.07	0.50			2/25/20 20:24	N	II
KQ2002694-20	Carbon, Total Organic	CCB		Water	0.30 mg/L	10 ml	0.30 mg/L J	1	0.07	0.50			2/26/20 01:16	N	II
KQ2002694-21	Carbon, Total Organic	CCB		Water	0.15 mg/L	10 ml	0.15 mg/L J	1	0.07	0.50			2/26/20 06:40	N	II
KQ2002694-23	Carbon, Total Organic	MB		Water	0.24 mg/L	10 ml	0.24 mg/L J	1	0.07	0.50			2/25/20 20:41	N	II
KQ2002694-24	Carbon, Total Organic	LCS		Water	27.17 mg/L	10 ml	27.2 mg/L	1	0.07	0.50	109		2/25/20 20:58	N	II
KQ2002694-25	Carbon, Total Organic	DUP	K2001512-001	Water	1.04 mg/L	10 ml	1.04 mg/L	1	0.07	0.50		3	2/25/20 21:47	N	II
KQ2002694-26	Carbon, Total Organic	DUP	K2001556-001	Water	15.57 mg/L	10 ml	15.6 mg/L	1	0.07	0.50		12*	2/25/20 22:19	N	V
KQ2002694-27	Carbon, Total Organic	DUP	K2001546-002	Drinking Water	0.52 mg/L	10 ml	0.52 mg/L	1	0.07	0.50		20*	2/26/20 08:02	N	I
KQ2002694-28	Carbon, Total Organic	DUP	K2001573-001	Water	5.32 mg/L	10 ml	5.32 mg/L	1	0.07	0.50		<1	2/26/20 08:34	N	II
KQ2002694-29	Carbon, Total Organic	DUP	K2001530-001	Water	1.79 mg/L	10 ml	1.79 mg/L	1	0.07	0.50		<1	2/26/20 09:06	N	V
KQ2002694-30	Carbon, Total Organic	DUP	K2001530-002	Water	1.07 mg/L	10 ml	1.07 mg/L	1	0.07	0.50		<1	2/26/20 09:38	N	V
KQ2002694-31	Carbon, Total Organic	DUP	K2001530-003	Water	0.68 mg/L	10 ml	0.68 mg/L	1	0.07	0.50		<1	2/26/20 10:10	N	V
KQ2002694-32	Carbon, Total Organic	CCV		Water	24.79 mg/L	10 ml	24.8 mg/L	1					2/26/20 11:47	N	II
KQ2002694-33	Carbon, Total Organic	CCB		Water	-0.06 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			2/26/20 12:03	N	II

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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:** 671033 **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
K2001530-004	Carbon, Total Organic	N/A		Water	0.71 mg/L	10 ml	0.71 mg/L	1	0.07	0.50			2/26/20 10:42	N	V
K2001530-005	Carbon, Total Organic	N/A		Water	1.12 mg/L	10 ml	1.12 mg/L	1	0.07	0.50			2/26/20 11:14	N	V
K2001530-006	Carbon, Total Organic	N/A		Water	1.14 mg/L	10 ml	1.14 mg/L	1	0.07	0.50			2/26/20 12:20	Y	V
K2001530-007	Carbon, Total Organic	N/A		Water	1.17 mg/L	10 ml	1.17 mg/L	1	0.07	0.50			2/26/20 13:25	N	V
K2001530-008	Carbon, Total Organic	N/A		Water	2.18 mg/L	10 ml	2.18 mg/L	1	0.07	0.50			2/26/20 13:57	N	V
K2001530-009	Carbon, Total Organic	N/A		Water	2.06 mg/L	10 ml	2.06 mg/L	1	0.07	0.50			2/26/20 14:30	N	V
K2001530-010	Carbon, Total Organic	N/A		Water	1.99 mg/L	10 ml	1.99 mg/L	1	0.07	0.50			2/26/20 15:02	N	V
K2001530-015	Carbon, Total Organic	N/A		Water	8.48 mg/L	10 ml	42.4 mg/L	5	0.4	2.5			2/26/20 15:34	N	V
K2001530-016	Carbon, Total Organic	N/A		Water	6.49 mg/L	10 ml	32.4 mg/L	5	0.4	2.5			2/26/20 16:06	N	V
K2001530-017	Carbon, Total Organic	N/A		Water	3.90 mg/L	10 ml	19.5 mg/L	5	0.4	2.5			2/26/20 16:38	N	V
K2001530-018	Carbon, Total Organic	N/A		Water	1.74 mg/L	10 ml	1.74 mg/L	1	0.07	0.50			2/26/20 18:17	N	V
K2001555-004	Carbon, Total Organic	N/A		Water	8.36 mg/L	10 ml	8.36 mg/L	1	0.07	0.50			2/26/20 18:49	N	IV
K2001555-005	Carbon, Total Organic	N/A		Water	2.34 mg/L	10 ml	2.34 mg/L	1	0.07	0.50			2/26/20 19:21	N	IV
K2001555-006	Carbon, Total Organic	N/A		Water	7.13 mg/L	10 ml	7.13 mg/L	1	0.07	0.50			2/26/20 19:53	N	IV
K2001555-007	Carbon, Total Organic	N/A		Water	8.93 mg/L	10 ml	8.93 mg/L	1	0.07	0.50			2/26/20 20:25	N	IV
K2001578-001	Carbon, Total Organic	N/A		Water	9.11 mg/L	10 ml	182 mg/L	20	2	10			2/26/20 22:36	N	II
K2001578-002	Carbon, Total Organic	N/A		Water	4.87 mg/L	10 ml	970 mg/L	200	20	100			2/26/20 23:08	N	II
K2001579-001	Carbon, Total Organic	N/A		Water	1.99 mg/L	10 ml	40 mg/L	20	2	10			2/26/20 23:40	N	II
K2001579-002	Carbon, Total Organic	N/A		Water	12.42 mg/L	10 ml	12.4 mg/L	1	0.07	0.50			2/27/20 00:12	N	II
KQ2002695-01	Carbon, Total Organic	CCV		Water	25.40 mg/L	10 ml	25.4 mg/L	1					2/26/20 06:23	N	V
KQ2002695-02	Carbon, Total Organic	CCV		Water	24.79 mg/L	10 ml	24.8 mg/L	1					2/26/20 11:47	N	V
KQ2002695-03	Carbon, Total Organic	CCV		Water	24.84 mg/L	10 ml	24.8 mg/L	1					2/26/20 17:10	N	V
KQ2002695-04	Carbon, Total Organic	CCV		Water	24.58 mg/L	10 ml	24.6 mg/L	1					2/26/20 22:03	N	V
KQ2002695-05	Carbon, Total Organic	CCV		Water	24.68 mg/L	10 ml	24.7 mg/L	1					2/27/20 03:26	N	V
KQ2002695-06	Carbon, Total Organic	CCB		Water	0.15 mg/L	10 ml	0.15 mg/L J	1	0.07	0.50			2/26/20 06:40	N	V
KQ2002695-07	Carbon, Total Organic	CCB		Water	-0.06 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			2/26/20 12:03	N	V
KQ2002695-08	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			2/26/20 17:27	N	V
KQ2002695-09	Carbon, Total Organic	CCB		Water	-0.12 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			2/26/20 22:19	N	V
KQ2002695-10	Carbon, Total Organic	CCB		Water	-0.06 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			2/27/20 03:43	N	V
KQ2002695-11	Carbon, Total Organic	MB		Water	0.07 mg/L	10 ml	0.07 mg/L J	1	0.07	0.50			2/26/20 06:56	N	V
KQ2002695-12	Carbon, Total Organic	LCS		Water	26.97 mg/L	10 ml	27.0 mg/L	1	0.07	0.50	108		2/26/20 07:13	N	V
KQ2002695-13	Carbon, Total Organic	MS	K2001530-006	Water	28.29 mg/L	10 ml	28.3 mg/L	1	0.07	0.50	109		2/26/20 12:52	N	V
KQ2002695-14	Carbon, Total Organic	DUP	K2001530-018	Water	1.54 mg/L	10 ml	1.54 mg/L	1	0.07	0.50		12*	2/26/20 18:17	N	V
KQ2002695-15	Carbon, Total Organic	DUP	K2001530-010	Water	1.98 mg/L	10 ml	1.98 mg/L	1	0.07	0.50		<1	2/26/20 15:02	N	V
KQ2002695-16	Carbon, Total Organic	DUP	K2001530-009	Water	2.06 mg/L	10 ml	2.06 mg/L	1	0.07	0.50		<1	2/26/20 14:30	N	V
KQ2002695-17	Carbon, Total Organic	DUP	K2001530-016	Water	6.57 mg/L	10 ml	32.9 mg/L	5	0.4	2.5		1	2/26/20 16:06	N	V

# 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:** 671033 **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
KQ2002695-18	Carbon, Total Organic	DUP	K2001530-017	Water	3.95 mg/L	10 ml	19.7 mg/L	5	0.4	2.5		1	2/26/20 16:38	N	V
KQ2002695-19	Carbon, Total Organic	DUP	K2001530-015	Water	8.73 mg/L	10 ml	43.7 mg/L	5	0.4	2.5		3	2/26/20 15:34	N	V
KQ2002695-20	Carbon, Total Organic	DUP	K2001530-004	Water	0.68 mg/L	10 ml	0.68 mg/L	1	0.07	0.50		4	2/26/20 10:42	N	V
KQ2002695-21	Carbon, Total Organic	DUP	K2001530-005	Water	1.14 mg/L	10 ml	1.14 mg/L	1	0.07	0.50		2	2/26/20 11:14	N	V
KQ2002695-22	Carbon, Total Organic	DUP	K2001530-006	Water	1.12 mg/L	10 ml	1.12 mg/L	1	0.07	0.50		2	2/26/20 12:20	N	V
KQ2002695-23	Carbon, Total Organic	DUP	K2001530-007	Water	1.17 mg/L	10 ml	1.17 mg/L	1	0.07	0.50		<1	2/26/20 13:25	N	V
KQ2002695-24	Carbon, Total Organic	DUP	K2001530-008	Water	2.10 mg/L	10 ml	2.10 mg/L	1	0.07	0.50		4	2/26/20 13:57	N	V
KQ2002695-25	Carbon, Total Organic	DUP	K2001555-004	Water	8.57 mg/L	10 ml	8.57 mg/L	1	0.07	0.50		2	2/26/20 18:49	N	IV
KQ2002695-26	Carbon, Total Organic	DUP	K2001555-007	Water	8.79 mg/L	10 ml	8.79 mg/L	1	0.07	0.50		2	2/26/20 20:25	N	IV
KQ2002695-27	Carbon, Total Organic	DUP	K2001555-005	Water	2.30 mg/L	10 ml	2.30 mg/L	1	0.07	0.50		2	2/26/20 19:21	N	IV
KQ2002695-28	Carbon, Total Organic	DUP	K2001555-006	Water	7.26 mg/L	10 ml	7.26 mg/L	1	0.07	0.50		2	2/26/20 19:53	N	IV
KQ2002695-29	Carbon, Total Organic	DUP	K2001578-001	Water	9.25 mg/L	10 ml	185 mg/L	20	2	10		2	2/26/20 22:36	N	II
KQ2002695-32	Carbon, Total Organic	DUP	K2001579-001	Water	1.99 mg/L	10 ml	40 mg/L	20	2	10		<1	2/26/20 23:40	N	II
KQ2002695-34	Carbon, Total Organic	DUP	K2001579-002	Water	12.39 mg/L	10 ml	12.4 mg/L	1	0.07	0.50		<1	2/27/20 00:12	N	II
KQ2002695-35	Carbon, Total Organic	DUP	K2001578-002	Water	4.81 mg/L	10 ml	960 mg/L	200	20	100		1	2/26/20 23:08	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:** 671034 **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
K2001514-001	Carbon, Total Organic	N/A		Water	0.03 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			2/27/20 05:37	N	IV
K2001514-002	Carbon, Total Organic	N/A		Water	0.02 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			2/27/20 06:09	N	IV
K2001521-001	Carbon, Total Organic	N/A		Water	0.80 mg/L	10 ml	0.80 mg/L	1	0.07	0.50			2/27/20 06:41	N	II
K2001521-002	Carbon, Total Organic	N/A		Water	18.63 mg/L	10 ml	18.6 mg/L	1	0.07	0.50			2/27/20 07:13	N	II
K2001521-003	Carbon, Total Organic	N/A		Water	0.75 mg/L	10 ml	0.75 mg/L	1	0.07	0.50			2/27/20 07:45	N	II
K2001521-004	Carbon, Total Organic	N/A		Water	1.55 mg/L	10 ml	1.55 mg/L	1	0.07	0.50			2/27/20 08:18	N	II
K2001521-005	Carbon, Total Organic	N/A		Water	1.71 mg/L	10 ml	1.71 mg/L	1	0.07	0.50			2/27/20 09:23	N	II
K2001554-001	Carbon, Total Organic	N/A		Ground Water	1.35 mg/L	10 ml	1.35 mg/L	1	0.07	0.50			2/27/20 09:55	N	II
K2001554-002	Carbon, Total Organic	N/A		Ground Water	1.39 mg/L	10 ml	1.39 mg/L	1	0.07	0.50			2/27/20 10:27	N	II
K2001554-003	Carbon, Total Organic	N/A		Ground Water	1.75 mg/L	10 ml	1.75 mg/L	1	0.07	0.50			2/27/20 10:59	N	II
K2001554-004	Carbon, Total Organic	N/A		Ground Water	1.23 mg/L	10 ml	1.23 mg/L	1	0.07	0.50			2/27/20 11:32	N	II
K2001554-005	Carbon, Total Organic	N/A		Ground Water	15.42 mg/L	10 ml	15.4 mg/L	1	0.07	0.50			2/27/20 12:04	N	II
K2001554-006	Carbon, Total Organic	N/A		Ground Water	3.15 mg/L	10 ml	3.15 mg/L	1	0.07	0.50			2/27/20 12:36	N	II
K2001554-007	Carbon, Total Organic	N/A		Ground Water	2.21 mg/L	10 ml	2.21 mg/L	1	0.07	0.50			2/27/20 13:08	N	II
K2001579-003	Carbon, Total Organic	N/A		Water	7.78 mg/L	10 ml	156 mg/L	20	2	10			2/27/20 00:45	Y	II
K2001579-004	Carbon, Total Organic	N/A		Water	2.63 mg/L	10 ml	2.63 mg/L	1	0.07	0.50			2/27/20 01:50	N	II
K2001579-005	Carbon, Total Organic	N/A		Water	7.56 mg/L	10 ml	7.56 mg/L	1	0.07	0.50			2/27/20 02:22	N	II
K2001579-006	Carbon, Total Organic	N/A		Water	8.12 mg/L	10 ml	8.12 mg/L	1	0.07	0.50			2/27/20 02:54	N	II
K2001591-003	Carbon, Total Organic	N/A		Water	1.70 mg/L	10 ml	1.70 mg/L	1	0.07	0.50			2/27/20 04:33	N	IV
K2001591-004	Carbon, Total Organic	N/A		Water	0.96 mg/L	10 ml	0.96 mg/L	1	0.07	0.50			2/27/20 05:05	N	IV
KQ2002696-01	Carbon, Total Organic	CCV		Water	24.58 mg/L	10 ml	24.6 mg/L	1					2/26/20 22:03	N	II
KQ2002696-02	Carbon, Total Organic	CCV		Water	24.68 mg/L	10 ml	24.7 mg/L	1					2/27/20 03:26	N	II
KQ2002696-03	Carbon, Total Organic	CCV		Water	24.06 mg/L	10 ml	24.1 mg/L	1					2/27/20 08:50	N	II
KQ2002696-04	Carbon, Total Organic	CCV		Water	24.13 mg/L	10 ml	24.1 mg/L	1					2/27/20 14:12	N	II
KQ2002696-05	Carbon, Total Organic	CCB		Water	-0.12 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			2/26/20 22:19	N	II
KQ2002696-06	Carbon, Total Organic	CCB		Water	-0.06 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			2/27/20 03:43	N	II
KQ2002696-07	Carbon, Total Organic	CCB		Water	-0.12 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			2/27/20 09:06	N	II
KQ2002696-08	Carbon, Total Organic	CCB		Water	-0.12 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			2/27/20 14:29	N	II
KQ2002696-09	Carbon, Total Organic	MB		Water	-0.11 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			2/26/20 17:44:00	N	II
KQ2002696-10	Carbon, Total Organic	LCS		Water	26.72 mg/L	10 mL	26.7 mg/L	1	0.07	0.50	107		2/26/20 18:00:00	N	II
KQ2002696-11	Carbon, Total Organic	MS	K2001579-003	Water	29.74 mg/L	10 ml	1190 mg/L	40	3	20	103		2/27/20 01:17	N	II
KQ2002696-12	Carbon, Total Organic	DUP	K2001514-001	Water	0.01 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50		NC	2/27/20 05:37	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:** 671034 **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
KQ2002696-13	Carbon, Total Organic	DUP	K2001514-002	Water	0.01 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50		NC	2/27/20 06:09	N	IV
KQ2002696-14	Carbon, Total Organic	DUP	K2001521-001	Water	0.79 mg/L	10 ml	0.79 mg/L	1	0.07	0.50		2	2/27/20 06:41	N	II
KQ2002696-15	Carbon, Total Organic	DUP	K2001521-002	Water	18.74 mg/L	10 ml	18.7 mg/L	1	0.07	0.50		<1	2/27/20 07:13	N	II
KQ2002696-16	Carbon, Total Organic	DUP	K2001521-003	Water	0.70 mg/L	10 ml	0.70 mg/L	1	0.07	0.50		7	2/27/20 07:45	N	II
KQ2002696-17	Carbon, Total Organic	DUP	K2001521-004	Water	1.56 mg/L	10 ml	1.56 mg/L	1	0.07	0.50		<1	2/27/20 08:18	N	II
KQ2002696-18	Carbon, Total Organic	DUP	K2001521-005	Water	1.65 mg/L	10 ml	1.65 mg/L	1	0.07	0.50		3	2/27/20 09:23	N	II
KQ2002696-19	Carbon, Total Organic	DUP	K2001554-006	Ground Water	3.03 mg/L	10 ml	3.03 mg/L	1	0.07	0.50		4	2/27/20 12:36	N	II
KQ2002696-20	Carbon, Total Organic	DUP	K2001554-007	Ground Water	2.24 mg/L	10 ml	2.24 mg/L	1	0.07	0.50		1	2/27/20 13:08	N	II
KQ2002696-21	Carbon, Total Organic	DUP	K2001554-004	Ground Water	1.17 mg/L	10 ml	1.17 mg/L	1	0.07	0.50		5	2/27/20 11:32	N	II
KQ2002696-22	Carbon, Total Organic	DUP	K2001554-005	Ground Water	15.91 mg/L	10 ml	15.9 mg/L	1	0.07	0.50		3	2/27/20 12:04	N	II
KQ2002696-24	Carbon, Total Organic	DUP	K2001554-001	Ground Water	1.30 mg/L	10 ml	1.30 mg/L	1	0.07	0.50		4	2/27/20 09:55	N	II
KQ2002696-25	Carbon, Total Organic	DUP	K2001554-002	Ground Water	1.42 mg/L	10 ml	1.42 mg/L	1	0.07	0.50		2	2/27/20 10:27	N	II
KQ2002696-26	Carbon, Total Organic	DUP	K2001554-003	Ground Water	1.72 mg/L	10 ml	1.72 mg/L	1	0.07	0.50		2	2/27/20 10:59	N	II
KQ2002696-27	Carbon, Total Organic	DUP	K2001579-003	Water	7.68 mg/L	10 ml	154 mg/L	20	2	10		1	2/27/20 00:45	N	II
KQ2002696-28	Carbon, Total Organic	DUP	K2001591-003	Water	1.62 mg/L	10 ml	1.62 mg/L	1	0.07	0.50		5	2/27/20 04:33	N	IV
KQ2002696-29	Carbon, Total Organic	DUP	K2001591-004	Water	0.92 mg/L	10 ml	0.92 mg/L	1	0.07	0.50		3	2/27/20 05:05	N	IV
KQ2002696-30	Carbon, Total Organic	DUP	K2001579-004	Water	2.58 mg/L	10 ml	2.58 mg/L	1	0.07	0.50		2	2/27/20 01:50	N	II
KQ2002696-31	Carbon, Total Organic	DUP	K2001579-005	Water	7.66 mg/L	10 ml	7.66 mg/L	1	0.07	0.50		1	2/27/20 02:22	N	II
KQ2002696-32	Carbon, Total Organic	DUP	K2001579-006	Water	8.06 mg/L	10 ml	8.06 mg/L	1	0.07	0.50		<1	2/27/20 02:54	N	II

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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:** 671330 **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
K2001530-011	Carbon, Total Organic	N/A		Water	2.12 mg/L	10 ml	2.12 mg/L	1	0.07	0.50			2/26/20 20:57	Y	V
K2001599-001	Carbon, Total Organic	N/A		Water	1.71 mg/L	10 ml	1.71 mg/L	1	0.07	0.50			2/27/20 13:40	N	IV
KQ2002703-01	Carbon, Total Organic	DUP	K2001599-001	Water	1.77 mg/L	10 ml	1.77 mg/L	1	0.07	0.50		3	2/27/20 13:40	N	IV
KQ2002703-02	Carbon, Total Organic	CCV		Water	24.84 mg/L	10 ml	24.8 mg/L	1					2/26/20 17:10	N	IV
KQ2002703-03	Carbon, Total Organic	CCV		Water	24.58 mg/L	10 ml	24.6 mg/L	1					2/26/20 22:03	N	IV
KQ2002703-04	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			2/26/20 17:27	N	IV
KQ2002703-05	Carbon, Total Organic	CCB		Water	-0.12 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			2/26/20 22:19	N	IV
KQ2002703-06	Carbon, Total Organic	MB		Water	-0.12 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			2/27/20 04:00	N	IV
KQ2002703-07	Carbon, Total Organic	LCS		Water	26.58 mg/L	10 ml	26.6 mg/L	1	0.07	0.50	106		2/27/20 04:16	N	IV
KQ2002703-08	Carbon, Total Organic	MS	K2001530-011	Water	29.59 mg/L	10 ml	29.6 mg/L	1	0.07	0.50	110		2/26/20 21:29	N	V
KQ2002703-09	Carbon, Total Organic	DUP	K2001530-011	Water	2.05 mg/L	10 ml	2.05 mg/L	1	0.07	0.50		4	2/26/20 20:57	N	V
KQ2002703-10	Carbon, Total Organic	CCV		Water	24.06 mg/L	10 ml	24.1 mg/L	1					2/27/20 08:50	N	V
KQ2002703-11	Carbon, Total Organic	CCV		Water	24.13 mg/L	10 ml	24.1 mg/L	1					2/27/20 14:12	N	V
KQ2002703-12	Carbon, Total Organic	CCB		Water	-0.12 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			2/27/20 09:06	N	V
KQ2002703-13	Carbon, Total Organic	CCB		Water	-0.12 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			2/27/20 14:29	N	V

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

0.414				OBSERVATIONS	13	ABOVE
0.359				STD Deviation	0.16518	ABOVE
0.420				AVERAGE	0.14876	ABOVE
0.273	0.273			UCL	0.31394	0.2732
0.198	0.198			LCL	-0.01641	0.1983
0.066	0.066					0.0662
0.125	0.125	0.125	######			0.1246
0.014	0.014			OBSERVATIONS	6	0.0135
0.000				STD Deviation	0.05527	0
0.065	0.065			AVERAGE	0.12345	0.0649
0.000				UCL	0.17872	0
0.000				LCL	0.06818	0
0.000						0
						0
				OBSERVATIONS	1	0
				STD Deviation	#DIV/0!	0
				AVERAGE	0.12460	0
				UCL	#DIV/0!	0
				LCL	#DIV/0!	0
						0
						0
				OBSERVATIONS	0	0
				STD Deviation	#DIV/0!	0
				AVERAGE	#DIV/0!	0
						0
						0
						0
						0
						0
						0

ALS ENVIRONMENTAL

Matrix: WATER

Analysis: Total Organic Carbon (WATER) Method:Oxidation EPA 415.1/9060/5310C

Printout	Sample #	Dil. Factor	Solution Conc.,mg/L	Blank Correction, mg/L	Net mg/L	TOC mg/L	Reported TOC mg/L	
CBA	RB	1			0.0000	0	<0.5	
2	ccv	1	25.496	0.1235	25.3728	25.37275	25.4	2/25/2020
3	ccb	1	0.414	0.1235	0.2903	0.29025	<0.5	2/25/2020
4	mb	1	0.359	0.1235	0.2358	0.23575	<0.5	2/25/2020
5	lcs	1	27.291	0.1235	27.1675	27.16745	27.2	2/25/2020
6	K2001512-001	1	1.204	0.1235	1.0802	1.08015	1.08	2/25/2020
7	K2001512-001	1	1.167	0.1235	1.0440	1.04395	1.0	2/25/2020
8	K2001556-001	1	13.880	0.1235	13.7568	13.75675	14	2/25/2020
9	K2001556-001	1	15.697	0.1235	15.5739	15.57385	15.57	2/25/2020
10	K2001451-001	2	1.500	0.1235	1.3768	2.7535	2.75	2/25/2020
11	K2001451-001	2	1.120	0.1235	0.9970	1.9939	2.0	2/25/2020
12	K2001451-002	2	2.394	0.1235	2.2703	4.5405	4.54	2/25/2020
13	K2001451-002	2	2.376	0.1235	2.2525	4.5049	4.50	2/25/2020
14	K2001451-003	2	0.593	0.1235	0.4696	0.9391	0.94	2/25/2020
15	K2001451-003	2	0.609	0.1235	0.4853	0.9705	1.0	2/25/2020
16	K2001451-004	2	0.832	0.1235	0.7082	1.4163	1.4	2/26/2020
17	K2001451-004	2	0.844	0.1235	0.7206	1.4411	1.44	2/26/2020
18	ccv	1	25.659	0.1235	25.5356	25.53555	25.5	2/26/2020
19	ccb	1	0.420	0.1235	0.2969	0.29685	<0.5	2/26/2020
20	K2001451-005	2	20.588	0.1235	20.4646	40.9291	40.93	2/26/2020
21	K2001451-005	2	20.939	0.1235	20.8160	41.6319	41.63	2/26/2020
22	K2001451-006	2	1.008	0.1235	0.8843	1.7685	1.8	2/26/2020
23	K2001451-006	2	0.928	0.1235	0.8048	1.6095	1.6	2/26/2020
24	K2001451-007	2	0.788	0.1235	0.6648	1.3295	1.33	2/26/2020
25	K2001451-007	2	0.787	0.1235	0.6633	1.3265	1.33	2/26/2020

ICAL Date 10/20/16 ICAL ID#:11-GEN-05-51A

LCS =24.0 ppm APG 4013 Lot #010615 (REF# 11-GEN-05-50N)

CCV = 25.0 ppm (Ref.#11-GEN-05-52E)

Spike: 0.05 ml of 5000 ppm stock ----> 10.0 ml =25.0 ppm x Dilution Factor (Ref.# 11-GEN-05-51M)

	date	time
Analyzed By: BCD	Date Analyzed 2/28/20	
Reviewed By:	Date Reviewed 2/29/20	

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ALS ENVIRONMENTAL

Matrix: WATER

Analysis: Total Organic Carbon (WATER) Method:Oxidation EPA 415.1/9060/5310C

Printout	Sample #	Dil. Factor	Solution Conc.,mg/L	Blank Correction, mg/L	Net mg/L	TOC mg/L	Reported TOC mg/L	
26	K2001451-008	2	0.424	0.1235	0.3003	0.6005	0.60	2/26/2020
27	K2001451-008	2	0.443	0.1235	0.3196	0.6391	0.64	2/26/2020
28	KQ2002694-01	2	16.286	0.1235	16.1626	32.3251	32.3	2/26/2020
29	K2001451-009	2	0.580	0.1235	0.4569	0.9137	0.9	2/26/2020
30	K2001451-009	2	0.602	0.1235	0.4782	0.9563	1.0	2/26/2020
31	K2001451-010	2	8.404	0.1235	8.2806	16.5611	16.6	2/26/2020
32	K2001451-010	2	8.446	0.1235	8.3223	16.6445	16.6	2/26/2020
33	K2001451-011	2	2.372	0.1235	2.2485	4.4969	4.5	2/26/2020
34	K2001451-011	2	2.027	0.1235	1.9039	3.8077	3.8	2/26/2020
35	K2001451-012	2	0.535	0.1235	0.4120	0.8239	0.8	2/26/2020
36	K2001451-012	2	0.490	0.1235	0.3666	0.7331	0.7	2/26/2020
37	ccv	1	25.522	0.1235	25.3981	25.39805	25.4	2/26/2020
38	ccb	1	0.273	0.1235	0.1498	0.14975	<0.5	2/26/2020
39	K2001451-013	2	0.463	0.1235	0.3392	0.6783	0.7	2/26/2020
40	K2001451-013	2	0.345	0.1235	0.2216	0.4431	<0.5	2/26/2020
41	K2001546-002	1	0.758	0.1235	0.6343	0.63425	0.6	2/26/2020
42	K2001546-002	1	0.641	0.1235	0.5179	0.51785	0.5	2/26/2020
43	K2001573-001	1	5.471	0.1235	5.3471	5.34705	5.3	2/26/2020
44	K2001573-001	1	5.443	0.1235	5.3197	5.31965	5.3	2/26/2020
45	K2001530-001	1	1.911	0.1235	1.7877	1.78765	1.8	2/26/2020
46	K2001530-001	1	1.917	0.1235	1.7937	1.79365	1.8	2/26/2020
47	K2001530-002	1	1.202	0.1235	1.0786	1.07855	1.1	2/26/2020
48	K2001530-002	1	1.197	0.1235	1.0734	1.07335	1.1	2/26/2020
49	K2001530-003	1	0.797	0.1235	0.6731	0.67305	0.7	2/26/2020
50	K2001530-003	1	0.801	0.1235	0.6773	0.67725	0.7	2/26/2020

Analyzed By: BD	Date Analyzed 2/25/20
Reviewed By:	Date Reviewed 2/29/20

ALS ENVIRONMENTAL

Matrix: WATER

Analysis: Total Organic Carbon (WATER) Method:Oxidation EPA 415.1/9060/5310C

Printout	Sample #	Dil. Factor	Solution Conc.,mg/L	Blank Correction, mg/L	Net mg/L	TOC mg/L	Reported TOC mg/L	
51	ccv	1	24.909	0.1235	24.7856	24.78555	24.79	2/26/2020
52	ccb	1	0.066	0.1235	-0.0573	-0.05725	<0.5	2/26/2020
53		1		0.0000	0.0000	0	<0.5	
54		1		0.0000	0.0000	0	<0.5	
55		1		0.0000	0.0000	0	<0.5	
56		1		0.0000	0.0000	0	<0.5	
57		1		0.0000	0.0000	0	<0.5	
58		1		0.0000	0.0000	0	<0.5	
59		1		0.0000	0.0000	0	<0.5	
60		1		0.0000	0.0000	0	<0.5	
61		1		0.0000	0.0000	0	<0.5	
62		1		0.0000	0.0000	0	<0.5	
63		1		0.0000	0.0000	0	<0.5	
64		1		0.0000	0.0000	0	<0.5	
65		1		0.0000	0.0000	0	<0.5	
66		1		0.0000	0.0000	0	<0.5	
67		1		0.0000	0.0000	0	<0.5	
68		1		0.0000	0.0000	0	<0.5	
69		1		0.0000	0.0000	0	<0.5	
70		1		0.0000	0.0000	0	<0.5	
71		1		0.0000	0.0000	0	<0.5	
72		1		0.0000	0.0000	0	<0.5	
73		1		0.0000	0.0000	0	<0.5	
74		1		0.0000	0.0000	0	<0.5	
75		1		0.0000	0.0000	0	<0.5	

Analyzed By: BVD	Date Analyzed 2/25/20
Reviewed By:	Date Reviewed 2/28/20

ALS ENVIRONMENTAL

Matrix: WATER

Analysis: Total Organic Carbon (WATER) Method:Oxidation EPA 415.1/9060/5310C

Printout	Sample #	Dil. Factor	Solution Conc.,mg/L	Blank Correction, mg/L	Net mg/L	TOC mg/L	Reported TOC mg/L	
CBA	RB	1			0.0000	0	<0.5	
2	ccv	1	25.522	0.1235	25.3981	25.39805	25.4	2/26/2020
3	ccb	1	0.273	0.1235	0.1498	0.14975	<0.5	2/26/2020
4	mb	1	0.198	0.1235	0.0749	0.07485	<0.5	2/26/2020
5	lcs	1	27.094	0.1235	26.9702	26.97015	27.0	2/26/2020
6	K2001530-004	1	0.837	0.1235	0.7136	0.71355	0.71	2/26/2020
7	K2001530-004	1	0.808	0.1235	0.6841	0.68405	0.7	2/26/2020
8	K2001530-005	1	1.241	0.1235	1.1172	1.11715	1	2/26/2020
9	K2001530-005	1	1.265	0.1235	1.1411	1.14105	1.14	2/26/2020
10	ccv	1	24.909	0.1235	24.7856	24.78555	24.79	2/26/2020
11	ccb	1	0.066	0.1235	-0.0573	-0.05725	<0.5	2/26/2020
12	K2001530-006	1	1.262	0.1235	1.1386	1.13855	1.14	2/26/2020
13	K2001530-006	1	1.243	0.1235	1.1193	1.11925	1.12	2/26/2020
14	KQ2002695-13	1	28.409	0.1235	28.2856	28.28555	28.29	2/26/2020
15	K2001530-007	1	1.291	0.1235	1.1673	1.16725	1.2	2/26/2020
16	K2001530-007	1	1.296	0.1235	1.1721	1.17205	1.2	2/26/2020
17	K2001530-008	1	2.305	0.1235	2.1814	2.18135	2.18	2/26/2020
18	K2001530-008	1	2.222	0.1235	2.0989	2.09885	2.1	2/26/2020
19	K2001530-009	1	2.182	0.1235	2.0588	2.05875	2.1	2/26/2020
20	K2001530-009	1	2.187	0.1235	2.0632	2.06315	2.06	2/26/2020
21	K2001530-010	1	2.114	0.1235	1.9902	1.99015	1.99	2/26/2020
22	K2001530-010	1	2.102	0.1235	1.9782	1.97815	2.0	2/26/2020
23	K2001530-015	5	8.607	0.1235	8.4839	42.41925	42.4	2/26/2020
24	K2001530-015	5	8.857	0.1235	8.7331	43.66525	43.67	2/26/2020
25	K2001530-016	5	6.612	0.1235	6.4882	32.44075	32.44	2/26/2020

ICAL Date 10/20/16 ICAL ID#:11-GEN-05-51A

LCS =24.0 ppm APG 4013 Lot #010615 (REF# 11-GEN-05-50N)

CCV = 25.0 ppm (Ref.#11-GEN-05-52E)

Spike: 0.05 ml of 5000 ppm stock ----> 10.0 ml =25.0 ppm x Dilution Factor (Ref.# 11-GEN-05-51M)

		date	time
Analyzed By: BW	Date Analyzed	2/25/20	
Reviewed By:	Date Reviewed	2/28/20	

ALS ENVIRONMENTAL

Matrix: WATER

Analysis: Total Organic Carbon (WATER) Method:Oxidation EPA 415.1/9060/5310C

Printout	Sample #	Dil. Factor	Solution Conc.,mg/L	Blank Correction, mg/L	Net mg/L	TOC mg/L	Reported TOC mg/L	
26	K2001530-016	5	6.697	0.1235	6.5736	32.86775	32.87	2/26/2020
27	K2001530-017	5	4.023	0.1235	3.8996	19.49775	19.50	2/26/2020
28	K2001530-017	5	4.072	0.1235	3.9489	19.74425	19.7	2/26/2020
29	ccv	1	24.959	0.1235	24.8358	24.83575	24.8	2/26/2020
30	ccb	1	0.125	0.1235	0.0012	0.00115	<0.5	2/26/2020
31	K2001530-018	1	1.861	0.1235	1.7375	1.73745	1.7	2/26/2020
32	K2001530-018	1	1.668	0.1235	1.5444	1.54435	1.5	2/26/2020
33	K2001555-004	1	8.484	0.1235	8.3603	8.36025	8.4	2/26/2020
34	K2001555-004	1	8.692	0.1235	8.5686	8.56855	8.6	2/26/2020
35	K2001555-005	1	2.465	0.1235	2.3420	2.34195	2.3	2/26/2020
36	K2001555-005	1	2.422	0.1235	2.2986	2.29855	2.3	2/26/2020
37	K2001555-006	1	7.254	0.1235	7.1307	7.13065	7.1	2/26/2020
38	K2001555-006	1	7.382	0.1235	7.2588	7.25875	7.3	2/26/2020
39	K2001555-007	1	9.056	0.1235	8.9328	8.93275	8.9	2/26/2020
40	K2001555-007	1	8.909	0.1235	8.7859	8.78585	8.8	2/26/2020
41	ccv	1	24.700	0.1235	24.5762	24.57615	24.6	2/26/2020
42	ccb	1	0.000	0.1235	-0.1235	-0.12345	<0.5	2/26/2020
43	K2001578-001	20	9.230	0.1235	9.1063	182.125	182.1	2/26/2020
44	K2001578-001	20	9.375	0.1235	9.2514	185.027	185.0	2/26/2020
45	K2001578-002	200	4.997	0.1235	4.8732	974.63	974.6	2/26/2020
46	K2001578-002	200	4.932	0.1235	4.8087	961.73	961.7	2/26/2020
47	K2001579-001	20	2.113	0.1235	1.9897	39.793	39.8	2/26/2020
48	K2001579-001	20	2.109	0.1235	1.9851	39.701	39.7	2/26/2020
49	K2001579-002	1	12.545	0.1235	12.4217	12.42165	12.4	2/27/2020
50	K2001579-002	1	12.509	0.1235	12.3852	12.38515	12.4	2/27/2020

Analyzed By: BKP	Date Analyzed 2/25/20
Reviewed By:	Date Reviewed 2/29/20

ALS ENVIRONMENTAL

Matrix: WATER

Analysis: Total Organic Carbon (WATER) Method:Oxidation EPA 415.1/9060/5310C

Printout	Sample #	Dil. Factor	Solution Conc.,mg/L	Blank Correction, mg/L	Net mg/L	TOC mg/L	Reported TOC mg/L	
51	ccv	1	24.804	0.1235	24.6807	24.68065	24.68	2/27/2020
52	ccb	1	0.065	0.1235	-0.0586	-0.05855	<0.5	2/27/2020
53		1		0.0000	0.0000	0	<0.5	
54		1		0.0000	0.0000	0	<0.5	
55		1		0.0000	0.0000	0	<0.5	
56		1		0.0000	0.0000	0	<0.5	
57		1		0.0000	0.0000	0	<0.5	
58		1		0.0000	0.0000	0	<0.5	
59		1		0.0000	0.0000	0	<0.5	
60		1		0.0000	0.0000	0	<0.5	
61		1		0.0000	0.0000	0	<0.5	
62		1		0.0000	0.0000	0	<0.5	
63		1		0.0000	0.0000	0	<0.5	
64		1		0.0000	0.0000	0	<0.5	
65		1		0.0000	0.0000	0	<0.5	
66		1		0.0000	0.0000	0	<0.5	
67		1		0.0000	0.0000	0	<0.5	
68		1		0.0000	0.0000	0	<0.5	
69		1		0.0000	0.0000	0	<0.5	
70		1		0.0000	0.0000	0	<0.5	
71		1		0.0000	0.0000	0	<0.5	
72		1		0.0000	0.0000	0	<0.5	
73		1		0.0000	0.0000	0	<0.5	
74		1		0.0000	0.0000	0	<0.5	
75		1		0.0000	0.0000	0	<0.5	

Analyzed By: BWP	Date Analyzed 2/25/20
Reviewed By:	Date Reviewed 2/26/20

ALS ENVIRONMENTAL

Matrix: WATER

Analysis: Total Organic Carbon (WATER) Method:Oxidation EPA 415.1/9060/5310C

Printout	Sample #	Dil. Factor	Solution Conc.,mg/L	Blank Correction, mg/L	Net mg/L	TOC mg/L	Reported TOC mg/L	
CBA	RB	1			0.0000	0	<0.5	
2	mb	1	0.014	0.1235	-0.1100	-0.10995	<0.5	2/26/2020
3	lcs	1	26.848	0.1235	26.7246	26.72455	26.7	2/26/2020
4	ccv	1	24.700	0.1235	24.5762	24.57615	24.6	2/26/2020
5	ccb	1	0.000	0.1235	-0.1235	-0.12345	<0.5	2/26/2020
6	K2001579-003	20	7.901	0.1235	7.7773	155.545	155.55	2/27/2020
7	K2001579-003	20	7.806	0.1235	7.6821	153.641	153.6	2/27/2020
8	KQ2002696-11	40	29.861	0.1235	29.7372	1189.486	1189	2/27/2020
9	K2001579-004	1	2.749	0.1235	2.6254	2.62535	2.63	2/27/2020
10	K2001579-004	1	2.707	0.1235	2.5837	2.58365	2.58	2/27/2020
11	K2001579-005	1	7.681	0.1235	7.5579	7.55785	7.6	2/27/2020
12	K2001579-005	1	7.779	0.1235	7.6559	7.65585	7.66	2/27/2020
13	K2001579-006	1	8.239	0.1235	8.1153	8.11525	8.12	2/27/2020
14	K2001579-006	1	8.186	0.1235	8.0629	8.06285	8.06	2/27/2020
15	ccv	1	24.804	0.1235	24.6807	24.68065	24.7	2/27/2020
16	ccb	1	0.065	0.1235	-0.0586	-0.05855	<0.5	2/27/2020
17	K2001591-003	1	1.825	0.1235	1.7020	1.70195	1.70	2/27/2020
18	K2001591-003	1	1.742	0.1235	1.6185	1.61845	1.6	2/27/2020
19	K2001591-004	1	1.079	0.1235	0.9556	0.95555	1.0	2/27/2020
20	K2001591-004	1	1.047	0.1235	0.9237	0.92365	0.92	2/27/2020
21	K2001514-001	1	0.151	0.1235	0.0276	0.02755	<0.5	2/27/2020
22	K2001514-001	1	0.132	0.1235	0.0089	0.00885	<0.5	2/27/2020
23	K2001514-002	1	0.143	0.1235	0.0196	0.01955	<0.5	2/27/2020
24	K2001514-002	1	0.136	0.1235	0.0127	0.01265	<0.5	2/27/2020
25	K2001521-001	1	0.923	0.1235	0.7991	0.79905	0.80	2/27/2020

ICAL Date 10/20/16 ICAL ID#:11-GEN-05-51A

LCS =24.0 ppm APG 4013 Lot #010615 (REF# 11-GEN-05-50N)

CCV = 25.0 ppm (Ref.#11-GEN-05-52E)

Spike: 0.05 ml of 5000 ppm stock ----> 10.0 ml =25.0 ppm x Dilution Factor (Ref.# 11-GEN-05-51M)

		date	time
Analyzed By: BW	Date Analyzed	2/25/20	
Reviewed By:	Date Reviewed	2/29/20	

Revision 1, 2010 R:\WET\ANALYSES\TOC\TEMPLATE\TOCwaterLIMS

ALS ENVIRONMENTAL

Matrix: WATER

Analysis: Total Organic Carbon (WATER) Method:Oxidation EPA 415.1/9060/5310C

Printout	Sample #	Dil. Factor	Solution Conc.,mg/L	Blank Correction, mg/L	Net mg/L	TOC mg/L	Reported TOC mg/L	
26	K2001521-001	1	0.909	0.1235	0.7853	0.78525	0.79	2/27/2020
27	K2001521-002	1	18.749	0.1235	18.6260	18.62595	18.63	2/27/2020
28	K2001521-002	1	18.868	0.1235	18.7446	18.74455	18.7	2/27/2020
29	K2001521-003	1	0.870	0.1235	0.7470	0.74695	0.7	2/27/2020
30	K2001521-003	1	0.820	0.1235	0.6965	0.69645	0.7	2/27/2020
31	K2001521-004	1	1.671	0.1235	1.5476	1.54755	1.5	2/27/2020
32	K2001521-004	1	1.679	0.1235	1.5551	1.55505	1.6	2/27/2020
33	ccv	1	24.186	0.1235	24.0624	24.06235	24.1	2/27/2020
34	ccb	1	0.000	0.1235	-0.1235	-0.12345	<0.5	2/27/2020
35	K2001521-005	1	1.830	0.1235	1.7070	1.70695	1.7	2/27/2020
36	K2001521-005	1	1.772	0.1235	1.6483	1.64825	1.6	2/27/2020
37	K2001554-001	1	1.473	0.1235	1.3499	1.34985	1.3	2/27/2020
38	K2001554-001	1	1.426	0.1235	1.3027	1.30265	1.3	2/27/2020
39	K2001554-002	1	1.512	0.1235	1.3889	1.38885	1.4	2/27/2020
40	K2001554-002	1	1.544	0.1235	1.4201	1.42005	1.4	2/27/2020
41	K2001554-003	1	1.877	0.1235	1.7535	1.75345	1.8	2/27/2020
42	K2001554-003	1	1.843	0.1235	1.7200	1.71995	1.7	2/27/2020
43	K2001554-004	1	1.354	0.1235	1.2305	1.23045	1.2	2/27/2020
44	K2001554-004	1	1.297	0.1235	1.1731	1.17305	1.2	2/27/2020
45	K2001554-005	1	15.547	0.1235	15.4231	15.42305	15.4	2/27/2020
46	K2001554-005	1	16.032	0.1235	15.9087	15.90865	15.9	2/27/2020
47	K2001554-006	1	3.270	0.1235	3.1465	3.14645	3.1	2/27/2020
48	K2001554-006	1	3.151	0.1235	3.0280	3.02795	3.0	2/27/2020
49	K2001554-007	1	2.334	0.1235	2.2105	2.21045	2.2	2/27/2020
50	K2001554-007	1	2.359	0.1235	2.2355	2.23545	2.2	2/27/2020

Analyzed By:	BCD	Date Analyzed	2/25/20
Reviewed By:		Date Reviewed	2/29/20

ALS ENVIRONMENTAL

Matrix: WATER

Analysis: Total Organic Carbon (WATER) Method:Oxidation EPA 415.1/9060/5310C

Printout	Sample #	Dil. Factor	Solution Conc.,mg/L	Blank Correction, mg/L	Net mg/L	TOC mg/L	Reported TOC mg/L	
51	ccv	1	24.254	0.1235	24.1306	24.13055	24.13	2/27/2020
52	ccb	1	0.000	0.1235	-0.1235	-0.12345	<0.5	2/27/2020
53		1		0.0000	0.0000	0	<0.5	
54		1		0.0000	0.0000	0	<0.5	
55		1		0.0000	0.0000	0	<0.5	
56		1		0.0000	0.0000	0	<0.5	
57		1		0.0000	0.0000	0	<0.5	
58		1		0.0000	0.0000	0	<0.5	
59		1		0.0000	0.0000	0	<0.5	
60		1		0.0000	0.0000	0	<0.5	
61		1		0.0000	0.0000	0	<0.5	
62		1		0.0000	0.0000	0	<0.5	
63		1		0.0000	0.0000	0	<0.5	
64		1		0.0000	0.0000	0	<0.5	
65		1		0.0000	0.0000	0	<0.5	
66		1		0.0000	0.0000	0	<0.5	
67		1		0.0000	0.0000	0	<0.5	
68		1		0.0000	0.0000	0	<0.5	
69		1		0.0000	0.0000	0	<0.5	
70		1		0.0000	0.0000	0	<0.5	
71		1		0.0000	0.0000	0	<0.5	
72		1		0.0000	0.0000	0	<0.5	
73		1		0.0000	0.0000	0	<0.5	
74		1		0.0000	0.0000	0	<0.5	
75		1		0.0000	0.0000	0	<0.5	

Analyzed By:	BVP	Date Analyzed	2/25/20
Reviewed By:	JC	Date Reviewed	2/29/20

ALS ENVIRONMENTAL

Matrix: WATER

Analysis: Total Organic Carbon (WATER) Method:Oxidation EPA 415.1/9060/5310C

Printout	Sample #	Dil. Factor	Solution Conc.,mg/L	Blank Correction, mg/L	Net mg/L	TOC mg/L	Reported TOC mg/L	
CBA	RB	1			0.0000	0	<0.5	
2	ccv	1	24.959	0.1235	24.8358	24.83575	24.8	2/26/2020
3	ccb	1	0.125	0.1235	0.0012	0.00115	<0.5	2/26/2020
4	K2001530-011	1	2.245	0.1235	2.1214	2.12135	2.1	2/26/2020
5	K2001530-011	1	2.171	0.1235	2.0478	2.04775	2.0	2/26/2020
6	KQ2002703-08	1	29.711	0.1235	29.5877	29.58765	29.59	2/26/2020
7	ccv	1	24.700	0.1235	24.5762	24.57615	24.6	2/26/2020
8	ccb	1	0.000	0.1235	-0.1235	-0.12345	<0.5	2/26/2020
9	mb	1	0.000	0.1235	-0.1235	-0.12345	<0.5	2/27/2020
10	lcs	1	26.706	0.1235	26.5828	26.58275	26.58	2/27/2020
11	ccv	1	24.186	0.1235	24.0624	24.06235	24.1	2/27/2020
12	ccb	1	0.000	0.1235	-0.1235	-0.12345	<0.5	2/27/2020
13	K2001599-001	1	1.832	0.1235	1.7083	1.70825	1.71	2/27/2020
14	K2001599-001	1	1.892	0.1235	1.7688	1.76875	1.77	2/27/2020
15	ccv	1	24.254	0.1235	24.1306	24.13055	24.1	2/27/2020
16	ccb	1	0.000	0.1235	-0.1235	-0.12345	<0.5	2/27/2020
17		1		0.0000	0.0000	0	<0.5	
18		1		0.0000	0.0000	0	<0.5	
19		1		0.0000	0.0000	0	<0.5	
20		1		0.0000	0.0000	0	<0.5	
21		1		0.0000	0.0000	0	<0.5	
22		1		0.0000	0.0000	0	<0.5	
23		1		0.0000	0.0000	0	<0.5	
24		1		0.0000	0.0000	0	<0.5	
25		1		0.0000	0.0000	0	<0.5	

ICAL Date 10/20/16 ICAL ID#:11-GEN-05-51A

LCS =24.0 ppm APG 4013 Lot #010615 (REF# 11-GEN-05-50N)

CCV = 25.0 ppm (Ref.#11-GEN-05-52E)

Spike: 0.05 ml of 5000 ppm stock ----> 10.0 ml =25.0 ppm x Dilution Factor (Ref.# 11-GEN-05-51M)

	date	time
Analyzed By: [illegible]	Date Analyzed 2/25/20	
Reviewed By:	Date Reviewed	

Revision 1, 2010 R:\WET\ANALYSES\TOC\TEMPLATE\TOCwaterLIMS

TOC: 671032, 671033, 671034, 671330

Schedule: 02252020

Version: 3
Instrument: Fusion1
Last Saved by: Fusion1 (Fusion1)
Last Saved on: 2020/02/25 16:39 - Tuesday

Position	Sample Type	Sample ID	Method ID (Calibration ID)	Reps
(Clean)	Clean	Clean		1
(Clean)	Clean	Clean		1
(Clean)	Clean	Clean		1
54	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	6
(Blank)	Blank	Reagent/Acid Blank		1
D	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	1
B	Check Standard	[TOC] CCV 021711 [25 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
D	Check Standard	[TOC] CCB 021711 [0.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
1	Sample	MB1	Extended Reaction 021711 (Extended Reaction 021711)	1
C	Check Standard	[TOC] LCS ER [25.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
2	Sample	ICS	Extended Reaction 021711 (Extended Reaction 021711)	1
3	Sample	Lot Check 020320-3DQL	Extended Reaction 021711 (Extended Reaction 021711)	1
4	Sample	K2001512-001.01	Extended Reaction 021711 (Extended Reaction 021711)	2
5	Sample	K2001556-001.01	Extended Reaction 021711 (Extended Reaction 021711)	2
6	Sample	K2001451-001.08 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
7	Sample	K2001451-002.08 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
8	Sample	K2001451-003.08 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
9	Sample	K2001451-004.08 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
B	Check Standard	[TOC] CCV 021711 [25 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
D	Check Standard	[TOC] CCB 021711 [0.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
10	Sample	K2001451-005.08 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
11	Sample	K2001451-006.08 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
12	Sample	K2001451-007.08 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
13	Sample	K2001451-008.08 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
14	Sample	K2001451-008.08 ms 2x	Extended Reaction 021711 (Extended Reaction 021711)	1
15	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	1
16	Sample	K2001451-009.08 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
17	Sample	K2001451-010.08 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
18	Sample	K2001451-011.08 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
19	Sample	K2001451-012.08 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
B	Check Standard	[TOC] CCV 021711 [25 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
D	Check Standard	[TOC] CCB 021711 [0.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
20	Sample	MB2	Extended Reaction 021711 (Extended Reaction 021711)	1
C	Check Standard	[TOC] LCS ER [25.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
21	Sample	K2001451-013.08 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
22	Sample	K2001546-002.01	Extended Reaction 021711 (Extended Reaction 021711)	2
23	Sample	K2001573-001.01	Extended Reaction 021711 (Extended Reaction 021711)	2
24	Sample	K2001530-001.02	Extended Reaction 021711 (Extended Reaction 021711)	2
25	Sample	K2001530-002.02	Extended Reaction 021711 (Extended Reaction 021711)	2
26	Sample	K2001530-003.02	Extended Reaction 021711 (Extended Reaction 021711)	2
27	Sample	K2001530-004.02	Extended Reaction 021711 (Extended Reaction 021711)	2
28	Sample	K2001530-005.02	Extended Reaction 021711 (Extended Reaction 021711)	2
B	Check Standard	[TOC] CCV 021711 [25 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
D	Check Standard	[TOC] CCB 021711 [0.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
29	Sample	K2001530-006.02	Extended Reaction 021711 (Extended Reaction 021711)	2
30	Sample	K2001530-006.02 ms	Extended Reaction 021711 (Extended Reaction 021711)	1
31	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	1
32	Sample	K2001530-007.02	Extended Reaction 021711 (Extended Reaction 021711)	2
33	Sample	K2001530-008.02	Extended Reaction 021711 (Extended Reaction 021711)	2
34	Sample	K2001530-009.11	Extended Reaction 021711 (Extended Reaction 021711)	2
35	Sample	K2001530-010.11	Extended Reaction 021711 (Extended Reaction 021711)	2
36	Sample	K2001530-015.11 5x	Extended Reaction 021711 (Extended Reaction 021711)	2
37	Sample	K2001530-016.11 5x	Extended Reaction 021711 (Extended Reaction 021711)	2
38	Sample	K2001530-017.11 5x	Extended Reaction 021711 (Extended Reaction 021711)	2

Schedule: 02252020

Position	Sample Type	Sample ID	Method ID (Calibration ID)	Reps
B	Check Standard	[TOC] CCV 021711 [25 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
D	Check Standard	[TOC] CCB 021711 [0.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
39	Sample	MB3	Extended Reaction 021711 (Extended Reaction 021711)	1
C	Check Standard	[TOC] LCS ER [25.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
40	Sample	K2001530-018.11	Extended Reaction 021711 (Extended Reaction 021711)	2
41	Sample	K2001555-004.07	Extended Reaction 021711 (Extended Reaction 021711)	2
42	Sample	K2001555-005.11	Extended Reaction 021711 (Extended Reaction 021711)	2
43	Sample	K2001555-006.11	Extended Reaction 021711 (Extended Reaction 021711)	2
44	Sample	K2001555-007.11	Extended Reaction 021711 (Extended Reaction 021711)	2
45	Sample	K2001530-011.11	Extended Reaction 021711 (Extended Reaction 021711)	2
46	Sample	K2001530-011.11 ms	Extended Reaction 021711 (Extended Reaction 021711)	1
47	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	1
B	Check Standard	[TOC] CCV 021711 [25 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
D	Check Standard	[TOC] CCB 021711 [0.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
48	Sample	K2001578-001.02 20x	Extended Reaction 021711 (Extended Reaction 021711)	2
49	Sample	K2001578-002.02 200x	Extended Reaction 021711 (Extended Reaction 021711)	2
50	Sample	K2001579-001.01 20x	Extended Reaction 021711 (Extended Reaction 021711)	2
51	Sample	K2001579-002.01	Extended Reaction 021711 (Extended Reaction 021711)	2
52	Sample	K2001579-003.01 20x	Extended Reaction 021711 (Extended Reaction 021711)	2
53	Sample	K2001579-003.01 ms 40x	Extended Reaction 021711 (Extended Reaction 021711)	1
54	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	1
55	Sample	K2001579-004.01	Extended Reaction 021711 (Extended Reaction 021711)	2
56	Sample	K2001579-005.01	Extended Reaction 021711 (Extended Reaction 021711)	2
57	Sample	K2001579-006.01	Extended Reaction 021711 (Extended Reaction 021711)	2
B	Check Standard	[TOC] CCV 021711 [25 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
D	Check Standard	[TOC] CCB 021711 [0.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
58	Sample	MB4	Extended Reaction 021711 (Extended Reaction 021711)	1
C	Check Standard	[TOC] LCS ER [25.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
59	Sample	K2001591-003.09	Extended Reaction 021711 (Extended Reaction 021711)	2
60	Sample	K2001591-004.09	Extended Reaction 021711 (Extended Reaction 021711)	2
61	Sample	K2001514-001.01	Extended Reaction 021711 (Extended Reaction 021711)	2
62	Sample	K2001514-002.01	Extended Reaction 021711 (Extended Reaction 021711)	2
63	Sample	K2001521-001.05	Extended Reaction 021711 (Extended Reaction 021711)	2
64	Sample	K2001521-002.05	Extended Reaction 021711 (Extended Reaction 021711)	2
65	Sample	K2001521-003.05	Extended Reaction 021711 (Extended Reaction 021711)	2
66	Sample	K2001521-004.05	Extended Reaction 021711 (Extended Reaction 021711)	2
B	Check Standard	[TOC] CCV 021711 [25 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
D	Check Standard	[TOC] CCB 021711 [0.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
67	Sample	K2001521-005.05	Extended Reaction 021711 (Extended Reaction 021711)	2
68	Sample	K2001554-001.03	Extended Reaction 021711 (Extended Reaction 021711)	2
69	Sample	K2001554-002.03	Extended Reaction 021711 (Extended Reaction 021711)	2
70	Sample	K2001554-003.03	Extended Reaction 021711 (Extended Reaction 021711)	2
71	Sample	K2001554-004.03	Extended Reaction 021711 (Extended Reaction 021711)	2
72	Sample	K2001554-005.03	Extended Reaction 021711 (Extended Reaction 021711)	2
73	Sample	K2001554-006.03	Extended Reaction 021711 (Extended Reaction 021711)	2
74	Sample	K2001554-007.03	Extended Reaction 021711 (Extended Reaction 021711)	2
75	Sample	K2001599-001.01	Extended Reaction 021711 (Extended Reaction 021711)	2
B	Check Standard	[TOC] CCV 021711 [25 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
D	Check Standard	[TOC] CCB 021711 [0.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.8769	18.7688	20.67	24.40	3.73	49.95	12:31
2	TOC	1.8434	18.4338	20.44	24.26	3.82	49.96	12:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 7.8366 (IC) (v1357)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v28)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	71	TOC	K2001554-004.03	1.3252 ppm	0.0406 ppm	3.0600%	2020/02/27 11:32

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.3539	13.5388	17.09	20.64	3.55	49.97	12:30
2	TOC	1.2965	12.9653	16.70	20.55	3.85	49.98	12:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 7.8366 (IC) (v1357)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v28)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	72	TOC	K2001554-005.03	15.7893 ppm	0.3433 ppm	2.1700%	2020/02/27 12:04

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	15.5465	155.4652	114.10	117.82	3.71	49.99	12:30
2	TOC	16.0321	160.3207	117.42	121.19	3.77	49.97	12:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 7.8366 (IC) (v1357)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v28)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	73	TOC	K2001554-006.03	3.2107 ppm	0.0838 ppm	2.6100%	2020/02/27 12:36

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.2699	32.6990	30.19	34.00	3.81	49.97	12:29
2	TOC	3.1514	31.5140	29.38	33.04	3.67	49.96	12:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 7.8366 (IC) (v1357)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v28)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	74	TOC	K2001554-007.03	2.3464 ppm	0.0177 ppm	0.7500%	2020/02/27 13:08

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.3339	23.3391	23.79	27.73	3.94	49.96	12:23
2	TOC	2.3589	23.5892	23.96	27.80	3.84	49.95	12:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 7.8366 (IC)	Extended Reaction	Extended Reaction

Fusion Report - 02252020
Tuesday, February 25, 2020 04:39 PM

(View - Reps, Unused Reps, Meta-Data, Signature, History)
Printed on 2020/02/27 14:53 - Thursday

Report Summary Information

Company Location:	Gen Chem Lab		
Schedule Name:	02252020	Engine Version:	1.1.5.1
Instrument Name:	Fusion1	Firmware Version:	1.2.0696
Report Version:	1 of 1	Connection:	RS232 COM1
Report Creation by Operators (schedule version):	Fusion1 (Fusion1) (v3)		
Comment:			

Report Results

Sample Type: Clean — From Schedule Version 3

	Pos	Analysis Type	Sample ID	Start Time
◆	(clean)		Clean	2020/02/25 16:39

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	11.70	15.41	3.70	49.63	05:22
2	TC Clean	5.19	8.85	3.66	50.03	04:00
3	TC Clean	2.44	6.05	3.61	50.02	03:48
4	TC Clean	1.40	5.11	3.71	50.01	03:54

Sample Type: Clean — From Schedule Version 3

	Pos	Analysis Type	Sample ID	Start Time
◆	(clean)		Clean	2020/02/25 17:01

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	0.62	4.45	3.83	49.57	05:21
2	TC Clean	4.62	8.36	3.74	49.95	04:00
3	TC Clean	2.67	6.57	3.90	50.00	03:48
4	TC Clean	2.04	5.79	3.76	50.00	03:48

Sample Type: Clean From Schedule Version 3

	Pos	Analysis Type	Sample ID	Start Time
◆	(clean)		Clean	2020/02/25 17:23

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	8.61	12.35	3.74	49.73	05:16
2	TC Clean	5.46	9.11	3.65	49.96	04:05
3	TC Clean	2.71	6.48	3.78	49.92	03:54
4	TC Clean	1.44	5.20	3.76	49.90	03:54

Sample Type: Sample From Schedule Version 3

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	54	TOC	RB	0.3704 ppm	0.0793 ppm	21.4000%	2020/02/25 17:45

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.5197	5.1967	11.47	15.13	3.66	50.01	12:29
2	TOC	0.3965	3.9649	10.63	14.64	4.01	50.03	12:25
3	TOC	0.3472	3.4719	10.29	14.29	4.00	50.04	12:27
4	TOC	0.3233	3.2335	10.13	14.19	4.06	50.05	12:26
5	TOC	0.3078	3.0784	10.02	14.00	3.97	50.06	12:26
6	TOC	0.3280	3.2803	10.16	13.98	3.82	50.06	12:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 7.9198 (IC) (v1356)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v28)

Sample Type: Blank (Creating v1357) From Schedule Version 3

	Pos	Analysis Type	Sample ID	Start Time
◆	(blank)		Reagent/Acid Blank	2020/02/25 19:17

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	10.45	15.18	4.73	49.69	05:25
2	TC Clean	4.13	8.09	3.96	50.03	04:01
3	TC Clean	2.02	5.82	3.80	50.05	03:45
4	TC Clean	1.02	4.90	3.88	50.01	03:46
5	Reagent Blank	9.29	13.20	3.91	50.06	05:05

6	Acid Blank	2.10	5.97	3.88	49.54	05:27	

Sample Type: Sample From Schedule Version 3

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	D	TOC	RB	0.6318 ppm	0.0000 ppm	0.0000%	2020/02/25 19:51

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.6318	6.3177	12.15	16.22	4.06	50.10	12:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 7.8366 (IC) (v1357)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v28)

Sample Type: Check Standard --> CCV 021711 From Schedule Version 3

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	B	TOC	25.0000	1:2	[TOC] CCV 021711 [25 ppm]	0 / infinity (NA / NA)	25.4962 ppm (PASS)	0.0000 ppm	0%	2020/02/25 20:07

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	25.4962	254.9620	182.30	186.30	4.00	50.08	12:30

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v28)	50 ppmC

Sample Type: Check Standard --> CCB 021711 From Schedule Version 3

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	D	TOC	0.0000	1:2	[TOC] CCB 021711 [0.0 ppm]	0 / infinity (NA / NA)	0.4137 ppm (PASS)	0.0000 ppm	0%	2020/02/25 20:24

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0.0 ppm	1	0.4137	4.1367	10.85	14.88	4.03	50.09	12:29

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v28)	0 ppmC

Sample Type: Sample From Schedule Version 3

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	1	TOC	MB1	0.3592 ppm	0.0000 ppm	0.0000%	2020/02/25 20:41

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.3592	3.5922	10.29	14.16	3.87	50.08	12:33

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 7.8366 (IC) (v1357)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v28)

Sample Type: Check Standard --> LCS ER From Schedule Version 3

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	C	TOC	25.0000	1:1	[TOC] LCS ER [25.0 ppm]	0 / infinity (NA / NA)	27.2909 ppm (PASS)	0.0000 ppm	0%	2020/02/25 20:58

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	27.2909	272.9095	194.57	198.40	3.83	50.08	12:29

Completion State	Success Action	Method	Calibration	STD Conc - Pos C
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v28)	25 ppmC

Sample Type: Sample From Schedule Version 3

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	2	TOC	ICS	0.6909 ppm	0.0000 ppm	0.0000%	2020/02/25 21:14

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.6909	6.9087	12.56	16.51	3.95	50.09	12:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 7.8366 (IC) (v1357)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v28)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	3	TOC	Lot Check 020320-3DQL	0.3374 ppm	0.0000 ppm	0.0000%	2020/02/25 21:31

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.3374	3.3742	10.14	14.08	3.94	50.06	12:33

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 7.8366 (IC) (v1357)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v28)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time

◆ 4	TOC	K2001512-001.01	1.1855 ppm	0.0257 ppm	2.1600%	2020/02/25 21:47

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.2036	12.0363	16.06	20.06	4.00	50.07	12:26
2	TOC	1.1674	11.6735	15.82	19.67	3.86	50.06	12:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 7.8366 (IC) (v1357)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v28)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	5	TOC	K2001556-001.01	14.7888 ppm	1.2849 ppm	8.6900%	2020/02/25 22:19

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	13.8802	138.8022	102.72	106.55	3.84	50.07	12:27
2	TOC	15.6973	156.9735	115.14	118.92	3.78	50.07	12:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 7.8366 (IC) (v1357)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v28)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	6	TOC	K2001451-001.08 2x	1.3103 ppm	0.2685 ppm	20.5000%	2020/02/25 22:52

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.5002	15.0017	18.09	21.90	3.81	50.06	12:27
2	TOC	1.1204	11.2039	15.50	19.23	3.74	50.05	12:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 7.8366 (IC) (v1357)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v28)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	7	TOC	K2001451-002.08 2x	2.3848 ppm	0.0126 ppm	0.5300%	2020/02/25 23:24

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.3937	23.9374	24.20	27.99	3.79	50.07	12:26
2	TOC	2.3759	23.7589	24.08	27.82	3.74	50.02	12:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 7.8366 (IC) (v1357)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v28)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	8	TOC	K2001451-003.08 2x	0.6008 ppm	0.0111 ppm	1.8400%	2020/02/25 23:56

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.5930	5.9300	11.89	15.49	3.60	50.02	12:27
2	TOC	0.6087	6.0865	12.00	15.84	3.84	50.01	12:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 7.8366 (IC) (v1357)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v28)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	9	TOC	K2001451-004.08 2x	0.8378 ppm	0.0088 ppm	1.0500%	2020/02/26 00:28

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.8316	8.3160	13.52	17.27	3.75	50.01	12:29
2	TOC	0.8440	8.4404	13.61	17.40	3.79	50.01	12:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 7.8366 (IC) (v1357)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v28)

Sample Type: Check Standard --> CCV 021711 From Schedule Version 3

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 021711 [25 ppm]	0 / infinity (NA / NA)	25.6590 ppm (PASS)	0.0000 ppm	0%	2020/02/26 01:00

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	25.6590	256.5903	183.41	187.19	3.78	50.05	12:35

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v28)	50 ppmC

Sample Type: Check Standard --> CCB 021711 From Schedule Version 3

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:2	[TOC] CCB 021711 [0.0 ppm]	0 / infinity (NA / NA)	0.4203 ppm (PASS)	0.0000 ppm	0%	2020/02/26 01:16

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0.0 ppm	1	0.4203	4.2025	10.89	14.52	3.63	50.03	12:29

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v28)	0 ppmC

Sample Type: Sample From Schedule Version 3

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time

◆	10	TOC	K2001451-005.08 2x	20.7637 ppm	0.2485 ppm	1.2000%	2020/02/26 01:33

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	20.5880	205.8798	148.57	152.30	3.73	50.00	12:32
2	TOC	20.9394	209.3938	150.97	154.83	3.86	50.01	12:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 7.8366 (IC) (v1357)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v28)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	11	TOC	K2001451-006.08 2x	0.9680 ppm	0.0563 ppm	5.8100%	2020/02/26 02:05

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.0077	10.0774	14.73	18.51	3.78	50.00	12:28
2	TOC	0.9282	9.2816	14.18	18.02	3.84	50.01	12:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 7.8366 (IC) (v1357)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v28)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	12	TOC	K2001451-007.08 2x	0.7874 ppm	0.0010 ppm	0.1300%	2020/02/26 02:38

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.7882	7.8816	13.22	17.00	3.77	50.00	12:26
2	TOC	0.7867	7.8669	13.21	16.96	3.75	49.98	12:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 7.8366 (IC) (v1357)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v28)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	13	TOC	K2001451-008.08 2x	0.4334 ppm	0.0137 ppm	3.1500%	2020/02/26 03:10

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.4237	4.2373	10.73	14.49	3.76	49.99	12:26
2	TOC	0.4430	4.4305	10.86	14.62	3.75	49.97	12:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 7.8366 (IC) (v1357)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v28)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	14	TOC	K2001451-008.08 ms 2x	16.2860 ppm	0.0000 ppm	0.0000%	2020/02/26 03:42

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	16.2860	162.8604	119.16	122.91	3.75	49.97	12:29

Dilution	Blank Contribution	Method	Calibration

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 7.8366 (IC) (v1357)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v28)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	15	TOC	RB	0.5397 ppm	0.0000 ppm	0.0000%	2020/02/26 03:58

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.5397	5.3975	11.53	15.35	3.82	50.01	12:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 7.8366 (IC) (v1357)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v28)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	16	TOC	K2001451-009.08 2x	0.5909 ppm	0.0151 ppm	2.5600%	2020/02/26 04:15

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.5803	5.8027	11.80	15.51	3.71	49.98	12:27
2	TOC	0.6016	6.0163	11.95	15.74	3.80	49.96	12:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 7.8366 (IC) (v1357)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v28)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	17	TOC	K2001451-010.08 2x	8.4248 ppm	0.0295 ppm	0.3500%	2020/02/26 04:47

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	8.4040	84.0397	65.28	69.05	3.77	49.97	12:29
2	TOC	8.4457	84.4566	65.57	69.36	3.79	49.98	12:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 7.8366 (IC) (v1357)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v28)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	18	TOC	K2001451-011.08 2x	2.1996 ppm	0.2437 ppm	11.0800%	2020/02/26 05:19

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.3719	23.7194	24.05	27.88	3.83	49.97	12:28
2	TOC	2.0273	20.2727	21.69	25.43	3.73	49.97	12:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 7.8366 (IC) (v1357)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v28)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	19	TOC	K2001451-012.08 2x	0.5127 ppm	0.0321 ppm	6.2600%	2020/02/26 05:51

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time

1	TOC	0.5354	5.3536	11.50	15.20	3.70	49.97	12:30
2	TOC	0.4900	4.9001	11.19	15.00	3.82	49.97	12:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 7.8366 (IC) (v1357)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v28)

Sample Type: Check Standard --> CCV 021711 From Schedule Version 3

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	B	TOC	25.0000	1:2	[TOC] CCV 021711 [25 ppm]	0 / infinity (NA / NA)	25.5215 ppm (PASS)	0.0000 ppm	0%	2020/02/26 06:23

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	25.5215	255.2151	182.47	186.34	3.86	49.96	12:30

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v28)	50 ppmC

Sample Type: Check Standard --> CCB 021711 From Schedule Version 3

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	D	TOC	0.0000	1:2	[TOC] CCB 021711 [0.0 ppm]	0 / infinity (NA / NA)	0.2732 ppm (PASS)	0.0000 ppm	0%	2020/02/26 06:40

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0.0 ppm	1	0.2732	2.7323	9.89	13.67	3.78	49.97	12:33

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v28)	0 ppmC

Sample Type: Sample From Schedule Version 3

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	20	TOC	MB2	0.1983 ppm	0.0000 ppm	0.0000%	2020/02/26 06:56

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.1983	1.9829	9.19	12.96	3.77	49.98	12:32

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 7.8366 (IC) (v1357)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v28)

Sample Type: Check Standard --> LCS ER From Schedule Version 3

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	C	TOC	25.0000	1:1	[TOC] LCS ER [25.0 ppm]	0 / infinity (NA / NA)	27.0936 ppm (PASS)	0.0000 ppm	0%	2020/02/26 07:13

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	27.0936	270.9360	193.22	197.13	3.91	49.95	12:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos C
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v28)	25 ppmC

Sample Type: Sample From Schedule Version 3

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	21	TOC	K2001451-013.08 2x	0.4038 ppm	0.0832 ppm	20.6000%	2020/02/26 07:30

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.4626	4.6265	11.00	14.74	3.74	49.97	12:26
2	TOC	0.3450	3.4503	10.20	14.05	3.85	49.97	12:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 7.8366 (IC) (v1357)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v28)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	22	TOC	K2001546-002.01	0.6995 ppm	0.0823 ppm	11.7700%	2020/02/26 08:02

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.7577	7.5773	13.02	16.80	3.78	49.99	12:27
2	TOC	0.6413	6.4128	12.22	16.21	3.99	49.99	12:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 7.8366 (IC) (v1357)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v28)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	23	TOC	K2001573-001.01	5.4568 ppm	0.0193 ppm	0.3500%	2020/02/26 08:34

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	5.4705	54.7047	45.23	49.12	3.89	49.99	12:27
2	TOC	5.4431	54.4311	45.04	48.83	3.79	50.00	12:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 7.8366 (IC) (v1357)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v28)

		Analysis			Std. Dev.		

	Pos	Type	Sample ID	Result (ppmC)	(ppmC)	RSD	Start Time
◈	24	TOC	K2001530-001.02	1.9141 ppm	0.0042 ppm	0.2200%	2020/02/26 09:06

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.9111	19.1111	20.90	24.75	3.85	50.01	12:26
2	TOC	1.9171	19.1711	20.94	24.57	3.63	50.01	12:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 7.8366 (IC) (v1357)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v28)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	25	TOC	K2001530-002.02	1.1994 ppm	0.0037 ppm	0.3100%	2020/02/26 09:38

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.2020	12.0202	16.05	19.88	3.83	50.01	12:29
2	TOC	1.1968	11.9676	16.02	19.65	3.63	50.01	12:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 7.8366 (IC) (v1357)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v28)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	26	TOC	K2001530-003.02	0.7986 ppm	0.0030 ppm	0.3800%	2020/02/26 10:10

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.7965	7.9649	13.28	17.15	3.87	50.01	12:30
2	TOC	0.8007	8.0074	13.31	17.14	3.83	50.01	12:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 7.8366 (IC) (v1357)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v28)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	27	TOC	K2001530-004.02	0.8222 ppm	0.0209 ppm	2.5400%	2020/02/26 10:42

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.8370	8.3702	13.56	17.38	3.82	50.00	12:25
2	TOC	0.8075	8.0747	13.36	17.10	3.74	50.02	12:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 7.8366 (IC) (v1357)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v28)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	28	TOC	K2001530-005.02	1.2526 ppm	0.0169 ppm	1.3500%	2020/02/26 11:14

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.2406	12.4064	16.32	20.14	3.83	50.01	12:27
2	TOC	1.2645	12.6449	16.48	20.24	3.76	50.01	12:29

Sample Type: Check Standard --> CCV 021711 From Schedule Version 3

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	B	TOC	25.0000	1:2	[TOC] CCV 021711 [25 ppm]	0 / infinity (NA / NA)	24.9090 ppm (PASS)	0.0000 ppm	0%	2020/02/26 11:47

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.9090	249.0898	178.28	182.21	3.93	50.03	12:35

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v28)	50 ppmC

Sample Type: Check Standard --> CCB 021711 From Schedule Version 3

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	D	TOC	0.0000	1:2	[TOC] CCB 021711 [0.0 ppm]	0 / infinity (NA / NA)	0.0662 ppm (PASS)	0.0000 ppm	0%	2020/02/26 12:03

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0.0 ppm	1	0.0662	0.6622	8.47	12.36	3.89	50.04	12:29

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v28)	0 ppmC

Sample Type: Sample From Schedule Version 3

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	29	TOC	K2001530-006.02	1.2523 ppm	0.0137 ppm	1.0900%	2020/02/26 12:20

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.2620	12.6200	16.46	20.25	3.79	50.03	12:29
2	TOC	1.2427	12.4269	16.33	20.09	3.76	50.04	12:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 7.8366 (IC) (v1357)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v28)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	30	TOC	K2001530-006.02 ms	28.4090 ppm	0.0000 ppm	0.0000%	2020/02/26 12:52

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	28.4090	284.0905	202.03	205.67	3.64	50.02	12:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 7.8366 (IC) (v1357)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v28)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	31	TOC	RB	0.1965 ppm	0.0000 ppm	0.0000%	2020/02/26 13:09

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.1965	1.9654	9.18	12.90	3.72	50.01	12:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 7.8366 (IC) (v1357)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v28)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	32	TOC	K2001530-007.02	1.2931 ppm	0.0034 ppm	0.2600%	2020/02/26 13:25

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.2907	12.9068	16.66	20.40	3.74	50.00	12:28
2	TOC	1.2955	12.9551	16.69	20.46	3.77	50.00	12:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 7.8366 (IC) (v1357)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v28)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	33	TOC	K2001530-008.02	2.2635 ppm	0.0583 ppm	2.5800%	2020/02/26 13:57

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.3048	23.0479	23.59	27.41	3.82	50.00	12:26
2	TOC	2.2223	22.2228	23.03	26.83	3.81	49.97	12:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 7.8366 (IC) (v1357)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v28)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	34	TOC	K2001530-009.11	2.1844 ppm	0.0031 ppm	0.1400%	2020/02/26 14:30

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.1822	21.8220	22.75	26.53	3.77	49.98	12:30
2	TOC	2.1866	21.8659	22.78	26.52	3.74	49.96	12:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 7.8366 (IC) (v1357)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v28)

		Analysis			Std. Dev.		

	Pos	Type	Sample ID	Result (ppmC)	(ppmC)	RSD	Start Time
◆	35	TOC	K2001530-010.11	2.1076 ppm	0.0085 ppm	0.4000%	2020/02/26 15:02

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.1136	21.1359	22.28	26.08	3.79	49.97	12:28
2	TOC	2.1016	21.0159	22.20	26.15	3.95	49.95	12:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 7.8366 (IC) (v1357)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v28)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	36	TOC	K2001530-015.11 5x	8.7319 ppm	0.1762 ppm	2.0200%	2020/02/26 15:34

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	8.6073	86.0732	66.67	70.50	3.83	49.93	12:28
2	TOC	8.8565	88.5646	68.38	72.15	3.77	49.92	12:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 7.8366 (IC) (v1357)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v28)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	37	TOC	K2001530-016.11 5x	6.6543 ppm	0.0604 ppm	0.9100%	2020/02/26 16:06

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	6.6116	66.1157	53.03	56.70	3.67	49.92	12:28
2	TOC	6.6970	66.9700	53.61	57.31	3.70	49.89	12:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 7.8366 (IC) (v1357)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v28)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	38	TOC	K2001530-017.11 5x	4.0477 ppm	0.0349 ppm	0.8600%	2020/02/26 16:38

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.0230	40.2303	35.34	39.04	3.70	49.88	12:28
2	TOC	4.0723	40.7233	35.67	39.42	3.75	49.88	12:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 7.8366 (IC) (v1357)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v28)

Sample Type: Check Standard --> CCV 021711 From Schedule Version 3

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	B	TOC	25.0000	1:2	[TOC] CCV 021711 [25 ppm]	0 / infinity (NA / NA)	24.9592 ppm (PASS)	0.0000 ppm	0%	2020/02/26 17:10

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.9592	249.5915	178.63	182.32	3.69	49.87	12:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v28)	50 ppmC

Sample Type: Check Standard --> CCB 021711 From Schedule Version 3

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	D	TOC	0.0000	1:2	[TOC] CCB 021711 [0.0 ppm]	0 / infinity (NA / NA)	0.1246 ppm (PASS)	0.0000 ppm	0%	2020/02/26 17:27

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0.0 ppm	1	0.1246	1.2459	8.87	12.83	3.96	49.88	12:33

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v28)	0 ppmC

Sample Type: Sample From Schedule Version 3

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	39	TOC	MB3	0.0135 ppm	0.0000 ppm	0.0000%	2020/02/26 17:44

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0135	0.1352	7.93	11.79	3.86	49.88	12:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 7.8366 (IC) (v1357)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v28)

Sample Type: Check Standard --> LCS ER From Schedule Version 3

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	C	TOC	25.0000	1:1	[TOC] LCS ER [25.0 ppm]	0 / infinity (NA / NA)	26.8480 ppm (PASS)	0.0000 ppm	0%	2020/02/26 18:00

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	26.8480	268.4797	191.54	195.22	3.68	49.91	12:32

Completion State	Success Action	Method	Calibration	STD Conc - Pos C
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v28)	25 ppmC

Sample Type: Sample From Schedule Version 3

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	40	TOC	K2001530-018.11	1.7644 ppm	0.1365 ppm	7.7400%	2020/02/26 18:17

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.8609	18.6093	20.56	24.27	3.72	49.95	12:26
2	TOC	1.6678	16.6783	19.24	22.95	3.71	49.99	12:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 7.8366 (IC) (v1357)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v28)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	41	TOC	K2001555-004.07	8.5879 ppm	0.1473 ppm	1.7200%	2020/02/26 18:49

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	8.4837	84.8370	65.83	69.37	3.55	50.00	12:26
2	TOC	8.6920	86.9202	67.25	71.16	3.91	50.04	12:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 7.8366 (IC) (v1357)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v28)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	42	TOC	K2001555-005.11	2.4437 ppm	0.0307 ppm	1.2600%	2020/02/26 19:21

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.4654	24.6542	24.69	28.60	3.92	50.06	12:27
2	TOC	2.4220	24.2198	24.39	28.07	3.68	50.07	12:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 7.8366 (IC) (v1357)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v28)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	43	TOC	K2001555-006.11	7.3182 ppm	0.0906 ppm	1.2400%	2020/02/26 19:53

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	7.2541	72.5409	57.42	61.11	3.69	50.08	12:30
2	TOC	7.3822	73.8225	58.30	62.12	3.82	50.14	12:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 7.8366 (IC) (v1357)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v28)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	44	TOC	K2001555-007.11	8.9827 ppm	0.1039 ppm	1.1600%	2020/02/26 20:25

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	9.0562	90.5615	69.74	73.52	3.78	50.11	12:29
2	TOC	8.9093	89.0927	68.74	72.61	3.88	50.13	12:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 7.8366 (IC) (v1357)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v28)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	45	TOC	K2001530-011.11	2.2080 ppm	0.0520 ppm	2.3600%	2020/02/26 20:57

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.2448	22.4481	23.18	26.99	3.81	50.13	12:25
2	TOC	2.1712	21.7123	22.68	26.31	3.63	50.08	12:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 7.8366 (IC) (v1357)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v28)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	46	TOC	K2001530-011.11 ms	29.7111 ppm	0.0000 ppm	0.0000%	2020/02/26 21:29

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	29.7111	297.1107	210.93	214.55	3.62	50.07	12:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 7.8366 (IC) (v1357)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v28)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	47	TOC	RB	0.0619 ppm	0.0000 ppm	0.0000%	2020/02/26 21:46

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0619	0.6195	8.26	12.06	3.80	50.05	12:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 7.8366 (IC) (v1357)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v28)

Sample Type: Check Standard --> CCV 021711 From Schedule Version 3

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	B	TOC	25.0000	1:2	[TOC] CCV 021711 [25 ppm]	0 / infinity (NA / NA)	24.6996 ppm (PASS)	0.0000 ppm	0%	2020/02/26 22:03

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.6996	246.9963	176.85	180.62	3.76	50.03	12:30

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v28)	50 ppmC

Sample Type: Check Standard --> CCB 021711 From Schedule Version 3

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	D	TOC	0.0000	1:2	[TOC] CCB 021711 [0.0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2020/02/26 22:19

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0.0 ppm	1	0.0000	0.0000	7.81	11.60	3.78	50.01	12:33

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v28)	0 ppmC

Sample Type: Sample From Schedule Version 3

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	48	TOC	K2001578-001.02 20x	9.3022 ppm	0.1026 ppm	1.1000%	2020/02/26 22:36

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	9.2297	92.2966	70.93	74.72	3.79	50.00	12:25
2	TOC	9.3748	93.7478	71.92	75.94	4.02	49.97	12:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 7.8366 (IC) (v1357)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v28)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	49	TOC	K2001578-002.02 200x	4.9644 ppm	0.0456 ppm	0.9200%	2020/02/26 23:08

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.9966	49.9662	41.99	46.01	4.02	49.96	12:25
2	TOC	4.9321	49.3210	41.55	45.35	3.80	49.96	12:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 7.8366 (IC) (v1357)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v28)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	50	TOC	K2001579-001.01 20x	2.1108 ppm	0.0033 ppm	0.1600%	2020/02/26 23:40

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.1131	21.1315	22.28	25.84	3.56	49.96	12:28

2	TOC	2.1085	21.0847	22.25	25.76	3.51	49.95	12:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 7.8366 (IC) (v1357)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v28)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	51	TOC	K2001579-002.01	12.5268 ppm	0.0259 ppm	0.2100%	2020/02/27 00:12

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	12.5451	125.4514	93.59	97.09	3.50	49.93	12:29
2	TOC	12.5086	125.0856	93.34	97.12	3.78	49.93	12:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 7.8366 (IC) (v1357)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v28)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	52	TOC	K2001579-003.01 20x	7.8531 ppm	0.0673 ppm	0.8600%	2020/02/27 00:45

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	7.9007	79.0071	61.84	65.47	3.63	49.93	12:27
2	TOC	7.8055	78.0548	61.19	64.88	3.69	49.90	12:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 7.8366 (IC) (v1357)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v28)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	53	TOC	K2001579-003.01 ms 40x	29.8606 ppm	0.0000 ppm	0.0000%	2020/02/27 01:17

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	29.8606	298.6059	211.95	215.61	3.66	49.92	12:32

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 7.8366 (IC) (v1357)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v28)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	54	TOC	RB	0.0325 ppm	0.0000 ppm	0.0000%	2020/02/27 01:33

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0325	0.3254	8.06	11.82	3.77	49.92	12:33

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 7.8366 (IC) (v1357)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v28)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	55	TOC	K2001579-004.01	2.7280 ppm	0.0295 ppm	1.0800%	2020/02/27 01:50

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.7488	27.4880	26.63	30.36	3.74	49.92	12:30
2	TOC	2.7071	27.0710	26.34	30.09	3.75	49.91	12:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 7.8366 (IC) (v1357)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v28)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	56	TOC	K2001579-005.01	7.7303 ppm	0.0693 ppm	0.9000%	2020/02/27 02:22

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	7.6813	76.8127	60.34	64.08	3.73	49.92	12:27
2	TOC	7.7793	77.7929	61.01	64.87	3.85	49.91	12:33

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 7.8366 (IC) (v1357)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v28)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	57	TOC	K2001579-006.01	8.2125 ppm	0.0370 ppm	0.4500%	2020/02/27 02:54

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	8.2387	82.3866	64.15	67.93	3.78	49.91	12:30
2	TOC	8.1863	81.8628	63.79	67.56	3.77	49.92	12:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 7.8366 (IC) (v1357)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v28)

Sample Type: Check Standard --> CCV 021711 From Schedule Version 3

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 021711 [25 ppm]	0 / infinity (NA / NA)	24.8041 ppm (PASS)	0.0000 ppm	0%	2020/02/27 03:26

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.8041	248.0408	177.57	181.33	3.76	49.91	12:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v28)	50 ppmC

Sample Type: Check Standard --> CCB 021711 From Schedule Version 3

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

◈	D	TOC	0.0000	1:2	[TOC] CCB 021711 [0.0 ppm]	0 / infinity (NA / NA)	0.0649 ppm (PASS)	0.0000 ppm	0%	2020/02/27 03:43

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0.0 ppm	1	0.0649	0.6490	8.46	12.15	3.69	49.90	12:30

Completion State: Success - Criteria met.
Success Action: Do Nothing
Method: Extended Reaction 021711 (v4)
Calibration: Extended Reaction 021711 (v28)
STD Conc - Pos D: 0 ppmC

Sample Type: Sample — From Schedule Version 3

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	58	TOC	MB4	0.0000 ppm	0.0000 ppm	0.0000%	2020/02/27 04:00

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.25	10.94	3.69	49.89	12:30

Dilution: 1:10
Blank Contribution: (TC) 7.8366 (IC) (v1357)
Method: Extended Reaction 021711 (v4)
Calibration: Extended Reaction 021711 (v28)

Sample Type: Check Standard --> LCS ER — From Schedule Version 3

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	C	TOC	25.0000	1:1	[TOC] LCS ER [25.0 ppm]	0 / infinity (NA / NA)	26.7062 ppm (PASS)	0.0000 ppm	0%	2020/02/27 04:16

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	26.7062	267.0621	190.57	194.41	3.84	49.90	12:33

Completion State: Success - Criteria met.
Success Action: Do Nothing
Method: Extended Reaction 021711 (v4)
Calibration: Extended Reaction 021711 (v28)
STD Conc - Pos C: 25 ppmC

Sample Type: Sample — From Schedule Version 3

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	59	TOC	K2001591-003.09	1.7836 ppm	0.0591 ppm	3.3100%	2020/02/27 04:33

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.8254	18.2539	20.31	24.29	3.98	49.86	12:25
2	TOC	1.7419	17.4185	19.74	23.46	3.72	49.88	12:26

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

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 7.8366 (IC) (v1357)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v28)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	60	TOC	K2001591-004.09	1.0630 ppm	0.0226 ppm	2.1200%	2020/02/27 05:05

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.0790	10.7899	15.21	18.93	3.72	49.88	12:28
2	TOC	1.0471	10.4710	14.99	18.81	3.81	49.88	12:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 7.8366 (IC) (v1357)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v28)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	61	TOC	K2001514-001.01	0.1417 ppm	0.0132 ppm	9.3500%	2020/02/27 05:37

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.1510	1.5104	8.87	12.58	3.71	49.90	12:29
2	TOC	0.1323	1.3232	8.74	12.51	3.77	49.88	12:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 7.8366 (IC) (v1357)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v28)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	62	TOC	K2001514-002.01	0.1396 ppm	0.0049 ppm	3.4800%	2020/02/27 06:09

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.1430	1.4300	8.81	12.47	3.66	49.87	12:26
2	TOC	0.1361	1.3612	8.77	12.53	3.77	49.89	12:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 7.8366 (IC) (v1357)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v28)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	63	TOC	K2001521-001.05	0.9156 ppm	0.0097 ppm	1.0600%	2020/02/27 06:41

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.9225	9.2245	14.14	17.81	3.67	49.89	12:26
2	TOC	0.9087	9.0870	14.05	17.83	3.78	49.88	12:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 7.8366 (IC) (v1357)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v28)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	64	TOC	K2001521-002.05	18.8087 ppm	0.0839 ppm	0.4500%	2020/02/27 07:13

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	18.7494	187.4935	136.00	139.83	3.83	49.86	12:27
2	TOC	18.8680	188.6800	136.81	140.47	3.66	49.87	12:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 7.8366 (IC) (v1357)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v28)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	65	TOC	K2001521-003.05	0.8451 ppm	0.0357 ppm	4.2200%	2020/02/27 07:45

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.8704	8.7037	13.79	17.63	3.85	49.86	12:27
2	TOC	0.8199	8.1990	13.44	17.21	3.77	49.89	12:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 7.8366 (IC) (v1357)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v28)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	66	TOC	K2001521-004.05	1.6748 ppm	0.0053 ppm	0.3200%	2020/02/27 08:18

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.6710	16.7104	19.26	23.06	3.80	49.90	12:27
2	TOC	1.6785	16.7851	19.31	23.02	3.71	49.88	12:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 7.8366 (IC) (v1357)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v28)

Sample Type: Check Standard --> CCV 021711 From Schedule Version 3

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	B	TOC	25.0000	1:2	[TOC] CCV 021711 [25 ppm]	0 / infinity (NA / NA)	24.1858 ppm (PASS)	0.0000 ppm	0%	2020/02/27 08:50

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.1858	241.8584	173.34	177.13	3.79	49.92	12:33

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v28)	50 ppmC

Sample Type: Check Standard --> CCB 021711 From Schedule Version 3

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

◆	D	TOC	0.0000	1:2	[TOC] CCB 021711 [0.0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2020/02/27 09:06

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0.0 ppm	1	0.0000	0.0000	6.65	10.45	3.80	49.92	12:29

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v28)	0 ppmC

Sample Type: Sample From Schedule Version 3

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	67	TOC	K2001521-005.05	1.8010 ppm	0.0415 ppm	2.3000%	2020/02/27 09:23

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.8304	18.3036	20.35	23.90	3.55	49.93	12:28
2	TOC	1.7717	17.7170	19.95	23.71	3.77	49.93	12:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 7.8366 (IC) (v1357)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v28)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	68	TOC	K2001554-001.03	1.4497 ppm	0.0333 ppm	2.3000%	2020/02/27 09:55

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.4733	14.7325	17.91	21.76	3.85	49.94	12:28
2	TOC	1.4261	14.2615	17.58	21.47	3.89	49.98	12:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 7.8366 (IC) (v1357)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v28)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	69	TOC	K2001554-002.03	1.5279 ppm	0.0220 ppm	1.4400%	2020/02/27 10:27

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.5123	15.1231	18.17	22.01	3.84	49.98	12:28
2	TOC	1.5435	15.4348	18.39	22.03	3.64	49.97	12:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 7.8366 (IC) (v1357)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v28)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	70	TOC	K2001554-003.03	1.8601 ppm	0.0237 ppm	1.2700%	2020/02/27 10:59

(v1357) 021711 (v4) 021711 (v28)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	75	TOC	K2001599-001.01	1.8620 ppm	0.0428 ppm	2.3000%	2020/02/27 13:40

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.8317	18.3168	20.36	24.21	3.85	49.93	12:30
2	TOC	1.8922	18.9224	20.77	24.43	3.66	49.91	12:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 7.8366 (IC) (v1357)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v28)

Sample Type: Check Standard --> CCV 021711 From Schedule Version 3

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	B	TOC	25.0000	1:2	[TOC] CCV 021711 [25 ppm]	0 / infinity (NA / NA)	24.2540 ppm (PASS)	0.0000 ppm	0%	2020/02/27 14:12

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.2540	242.5401	173.81	177.50	3.69	49.89	12:30

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v28)	50 ppmC

Sample Type: Check Standard --> CCB 021711 From Schedule Version 3

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	D	TOC	0.0000	1:2	[TOC] CCB 021711 [0.0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2020/02/27 14:29

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0.0 ppm	1	0.0000	0.0000	6.61	10.27	3.67	49.88	12:29

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v28)	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
v1356	3.5117	2.0770	0.0000	0.0000	0.0000	2020/02/25 14:17	Fusion1 (Fusion1)
v1357	3.0957	2.0950	0.0000	0.0000	0.0000	2020/02/25 19:51	Fusion1 (Fusion1)

Calibrations

Name: Extended Reaction 021711 (TOC)

Version: v28
Ver Creation: 2020/01/08 19:20
Comment:
Operator: Fusion1 (Fusion1)
Basic Analysis Type: TOC
Calibration curve formula: TOC: y = 6.836x + 8.019
r^2 value: TOC: r^2 = 0.99990

Basic Analysis Type: TOC

Sample ID	Y Raw Value	X Expected	Message	End Time
0.0 ppm	8.0870	0.0000		2020/01/08 17:41
0.50 ppm	11.6420	0.5000		2020/01/08 17:58
1.00 ppm	14.6390	1.0000		2020/01/08 18:14
5.00 ppm	43.5800	5.0000		2020/01/08 18:30
10.0 ppm	73.9500	10.0000		2020/01/08 18:46
25.0 ppm	180.1790	25.0000		2020/01/08 19:02
50.0 ppm	349.5080	50.0000		2020/01/08 19:18

Methods

Name: Extended Reaction 021711 (TOC)

Version: v4
Ver Creation: 2019/01/31 11:21
Comment:
Operator: Fusion1 (Fusion1)

Parameter	Value
SampleVolume	10.0 mL
Dilution	1:10
AcidVolume	0.5 ml
ReagentVolume	2.0 ml
UVReactorPrerinse	Off
UVReactorPrerinseVolume	5.0
NumberOfUVReactorPrerinses	1
ICSpargeTime	1.00 mins
DetectorSweepFlow	500 ml/min
PreSpargeTime	4.00 mins
SystemFlow	500 ml/min

Advanced Parameter	Value
NeedleRinseVolume	5.0 ml
VialPrimeVolume	2.0 ml
ICSamplePrimeVolume	2.0 ml
ICSpargeRinseVolume	12.0 ml
BaselineStabilizeTime	0.70 min
DetectorPressureFlow	150 ml/min
SyringeSpeedWaste	10
SyringeSpeedAcid	7
SyringeSpeedReagent	7
SyringeSpeedDIWater	7
NDIRPressurization	60 psig

SyringeSpeedSampleDispense	5
SyringeSpeedSampleAspirate	4
SyringeSpeedUVDispense	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	2020/02/27 14:46

StarLIMS Run: 671032, 671033, 671034, 671330

Analysis: DOC/TOC

Method: SM 5310 C, 9060A, 415.1, 9060

CCV: 11-GEN-05-82C 50 ppm LCS: 11-GEN-05-79J 25.0 ppm

ICAL Date: 1/7/2020

ICAL ID: 11-GEN-05-83-K->O/84-A/11-GEN-05-84-C->H

ICS ID: 11-GEN-05-78M

ICS TV: 25.0 ppm ICS % R < 1

Spike ID: 11-GEN-05-82C 0.05 ml of 5000 ppm stock ---> 10.0 ml = 25.0 ppm x dilution factor

Sodium Persulfate: 19-GEN-08-6-F

21 % H3PO4: 19-GEN-08-6-G

Equipment ID: K-TOC-03

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

FILTER ID: 16967789

Analyzed By: RD	Date Analyzed: 2/25/2020
Reviewed By: JL	Date Reviewed: 2/29/20

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
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February 27, 2020

Marcia Olive
Bhate Environmental Associates, Inc.
445 Union Blvd Ste 129
Lakewood, CO 80228

Work Order: **HS20020835**

Laboratory Results for: **Longhorn GW Treatment Plant Bi Weekly Samples**

Dear Marcia,

ALS Environmental received 2 sample(s) on Feb 20, 2020 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: 27-Feb-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi Weekly Samples
Work Order: HS20020835

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS20020835-01	LH18/24-SP650_021920	Water		19-Feb-2020 14:00	20-Feb-2020 08:55	☐
HS20020835-02	Trip Blank	Water	cg-011520280	19-Feb-2020 14:00	20-Feb-2020 08:55	☐

ALS Houston, US Date: 27-Feb-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi Weekly Samples
Work Order: HS20020835

CASE NARRATIVE

GCMS Volatiles by Method SW8260

Batch ID: R356766

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

WetChemistry by Method SW9056

Batch ID: R357033

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

ALS Houston, US Date: 27-Feb-20

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**
Project: Longhorn GW Treatment Plant Bi Weekly Samples WorkOrder:HS20020835
Sample ID: LH18/24-SP650_021920 Lab ID:HS20020835-01
Collection Date: 19-Feb-2020 14:00 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	21-Feb-2020 15:09
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	21-Feb-2020 15:09
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	21-Feb-2020 15:09
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	21-Feb-2020 15:09
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	21-Feb-2020 15:09
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	21-Feb-2020 15:09
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	21-Feb-2020 15:09
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	21-Feb-2020 15:09
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	21-Feb-2020 15:09
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	21-Feb-2020 15:09
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	21-Feb-2020 15:09
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	21-Feb-2020 15:09
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	21-Feb-2020 15:09
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	21-Feb-2020 15:09
1,2-Dichloroethane	**1.3**		**0.20**	**0.50**	**1.0**	**UG/L**	1	21-Feb-2020 15:09
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	21-Feb-2020 15:09
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	21-Feb-2020 15:09
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	21-Feb-2020 15:09
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	21-Feb-2020 15:09
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	21-Feb-2020 15:09
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	21-Feb-2020 15:09
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	21-Feb-2020 15:09
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	21-Feb-2020 15:09
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	21-Feb-2020 15:09
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	21-Feb-2020 15:09
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	21-Feb-2020 15:09
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	21-Feb-2020 15:09
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	21-Feb-2020 15:09
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	21-Feb-2020 15:09
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	21-Feb-2020 15:09
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	21-Feb-2020 15:09
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	21-Feb-2020 15:09
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	21-Feb-2020 15:09
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	21-Feb-2020 15:09
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	21-Feb-2020 15:09
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	21-Feb-2020 15:09
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	21-Feb-2020 15:09
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	21-Feb-2020 15:09
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	21-Feb-2020 15:09

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

ALS Houston, US Date: 27-Feb-20

Client: Bhate Environmental Associates, Inc.
ANALYTICAL REPORT
Project: Longhorn GW Treatment Plant Bi Weekly Samples WorkOrder:HS20020835
Sample ID: LH18/24-SP650_021920 Lab ID:HS20020835-01
Collection Date: 19-Feb-2020 14:00 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	21-Feb-2020 15:09
cis-1,2-Dichloroethene	**24**		**0.20**	**0.50**	**1.0**	**UG/L**	1	21-Feb-2020 15:09
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	21-Feb-2020 15:09
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	21-Feb-2020 15:09
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	21-Feb-2020 15:09
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	21-Feb-2020 15:09
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	21-Feb-2020 15:09
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	21-Feb-2020 15:09
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	21-Feb-2020 15:09
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	21-Feb-2020 15:09
Methylene chloride	**1.1**	J	**0.40**	**1.0**	**2.0**	**UG/L**	1	21-Feb-2020 15:09
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	21-Feb-2020 15:09
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	21-Feb-2020 15:09
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	21-Feb-2020 15:09
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	21-Feb-2020 15:09
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	21-Feb-2020 15:09
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	21-Feb-2020 15:09
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	21-Feb-2020 15:09
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	21-Feb-2020 15:09
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	21-Feb-2020 15:09
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	21-Feb-2020 15:09
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	21-Feb-2020 15:09
Trichloroethene	**5.0**		**0.20**	**0.50**	**1.0**	**UG/L**	1	21-Feb-2020 15:09
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	21-Feb-2020 15:09
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	21-Feb-2020 15:09
Surr: 1,2-Dichloroethane-d4	*94.4*			**0**	*81-118*	*%REC*	*1*	*21-Feb-2020 15:09*
Surr: 4-Bromofluorobenzene	*100*			**0**	*85-114*	*%REC*	*1*	*21-Feb-2020 15:09*
Surr: Dibromofluoromethane	*93.8*			**0**	*80-119*	*%REC*	*1*	*21-Feb-2020 15:09*
Surr: Toluene-d8	*108*			**0**	*89-112*	*%REC*	*1*	*21-Feb-2020 15:09*
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Chloride	**447**		**2.00**	**5.00**	**5.00**	**mg/L**	10	25-Feb-2020 16:47
Sulfate	**23.3**		**2.00**	**5.00**	**5.00**	**mg/L**	10	25-Feb-2020 16:47

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

ALS Houston, US Date: 27-Feb-20

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**
Project: Longhorn GW Treatment Plant Bi Weekly Samples WorkOrder:HS20020835
Sample ID: Trip Blank Lab ID:HS20020835-02
Collection Date: 19-Feb-2020 14:00 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	21-Feb-2020 14:21
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	21-Feb-2020 14:21
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	21-Feb-2020 14:21
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	21-Feb-2020 14:21
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	21-Feb-2020 14:21
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	21-Feb-2020 14:21
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	21-Feb-2020 14:21
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	21-Feb-2020 14:21
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	21-Feb-2020 14:21
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	21-Feb-2020 14:21
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	21-Feb-2020 14:21
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	21-Feb-2020 14:21
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	21-Feb-2020 14:21
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	21-Feb-2020 14:21
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	21-Feb-2020 14:21
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	21-Feb-2020 14:21
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	21-Feb-2020 14:21
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	21-Feb-2020 14:21
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	21-Feb-2020 14:21
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	21-Feb-2020 14:21
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	21-Feb-2020 14:21
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	21-Feb-2020 14:21
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	21-Feb-2020 14:21
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	21-Feb-2020 14:21
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	21-Feb-2020 14:21
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	21-Feb-2020 14:21
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	21-Feb-2020 14:21
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	21-Feb-2020 14:21
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	21-Feb-2020 14:21
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	21-Feb-2020 14:21
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	21-Feb-2020 14:21
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	21-Feb-2020 14:21
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	21-Feb-2020 14:21
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	21-Feb-2020 14:21
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	21-Feb-2020 14:21
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	21-Feb-2020 14:21
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	21-Feb-2020 14:21
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	21-Feb-2020 14:21
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	21-Feb-2020 14:21

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

ALS Houston, US Date: 27-Feb-20

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**

Project: Longhorn GW Treatment Plant Bi Weekly Samples WorkOrder:HS20020835

Sample ID: Trip Blank Lab ID:HS20020835-02

Collection Date: 19-Feb-2020 14:00 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	21-Feb-2020 14:21
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	21-Feb-2020 14:21
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	21-Feb-2020 14:21
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	21-Feb-2020 14:21
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	21-Feb-2020 14:21
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	21-Feb-2020 14:21
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	21-Feb-2020 14:21
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	21-Feb-2020 14:21
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	21-Feb-2020 14:21
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	21-Feb-2020 14:21
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	21-Feb-2020 14:21
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	21-Feb-2020 14:21
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	21-Feb-2020 14:21
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	21-Feb-2020 14:21
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	21-Feb-2020 14:21
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	21-Feb-2020 14:21
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	21-Feb-2020 14:21
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	21-Feb-2020 14:21
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	21-Feb-2020 14:21
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	21-Feb-2020 14:21
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	21-Feb-2020 14:21
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	21-Feb-2020 14:21
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	21-Feb-2020 14:21
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	21-Feb-2020 14:21
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	21-Feb-2020 14:21
Surr: 1,2-Dichloroethane-d4	*94.6*			**0**	*81-118*	*%REC*	*1*	*21-Feb-2020 14:21*
Surr: 4-Bromofluorobenzene	*102*			**0**	*85-114*	*%REC*	*1*	*21-Feb-2020 14:21*
Surr: Dibromofluoromethane	*93.6*			**0**	*80-119*	*%REC*	*1*	*21-Feb-2020 14:21*
Surr: Toluene-d8	*108*			**0**	*89-112*	*%REC*	*1*	*21-Feb-2020 14:21*

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

ALS Houston, US Date: 27-Feb-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi Weekly Samples
WorkOrder: HS20020835

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R356766 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Water	
HS20020835-01	LH18/24-SP650_021920	19 Feb 2020 14:00			21 Feb 2020 15:09	1
HS20020835-02	Trip Blank	19 Feb 2020 14:00			21 Feb 2020 14:21	1
Batch ID: R357033 (0)	**Test Name :** ANIONS BY SW9056A				**Matrix:** Water	
HS20020835-01	LH18/24-SP650_021920	19 Feb 2020 14:00			25 Feb 2020 16:47	10

ALS Houston, US Date: 27-Feb-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi Weekly Samples
WorkOrder: HS20020835

QC BATCH REPORT

Batch ID: R356766 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-200221** Units: **UG/L** Analysis Date: **21-Feb-2020 13:57**
Client ID: Run ID: **VOA6_356766** SeqNo: **5482493** 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: 27-Feb-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi Weekly Samples
WorkOrder: HS20020835

QC BATCH REPORT

Batch ID: R356766 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-200221** Units: **UG/L** Analysis Date: **21-Feb-2020 13:57**
Client ID: Run ID: **VOA6_356766** SeqNo: **5482493** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Carbon disulfide	1.0	2.0							U
Carbon tetrachloride	0.50	1.0							U
Chlorobenzene	0.50	1.0							U
Chloroethane	0.50	1.0							U
Chloroform	0.50	1.0							U
Chloromethane	0.50	1.0							U
cis-1,2-Dichloroethene	0.50	1.0							U
cis-1,3-Dichloropropene	0.50	1.0							U
Dibromochloromethane	0.50	1.0							U
Dibromomethane	0.50	1.0							U
Dichlorodifluoromethane	0.50	1.0							U
Ethylbenzene	0.50	1.0							U
Hexachlorobutadiene	1.0	1.0							U
Isopropylbenzene	0.50	1.0							U
m,p-Xylene	1.0	2.0							U
Methylene chloride	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	*46.77*	*1.0*	*50*	*0*	*93.5*	*81 - 118*			
Surr: 4-Bromofluorobenzene	*50.2*	*1.0*	*50*	*0*	*100*	*85 - 114*			
Surr: Dibromofluoromethane	*47.24*	*1.0*	*50*	*0*	*94.5*	*80 - 119*			
Surr: Toluene-d8	*55.01*	*1.0*	*50*	*0*	*110*	*89 - 112*			

ALS Houston, US Date: 27-Feb-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi Weekly Samples
WorkOrder: HS20020835

QC BATCH REPORT

Batch ID: R356766 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

LCS Sample ID: **VLCSW-200221** Units: **UG/L** Analysis Date: **21-Feb-2020 13:09**
Client ID: Run ID: **VOA6_356766** SeqNo: **5482492** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	23.4	1.0	20	0	117	78 - 124				
1,1,1-Trichloroethane	24.02	1.0	20	0	120	74 - 131				
1,1,2,2-Tetrachloroethane	19.89	1.0	20	0	99.5	71 - 121				
1,1,2-Trichloroethane	21.37	1.0	20	0	107	80 - 119				
1,1-Dichloroethane	21.36	1.0	20	0	107	77 - 125				
1,1-Dichloroethene	20.78	1.0	20	0	104	71 - 131				
1,1-Dichloropropene	22.03	1.0	20	0	110	78 - 125				
1,2,3-Trichlorobenzene	16.41	1.0	20	0	82.0	69 - 129				
1,2,3-Trichloropropane	20.79	1.0	20	0	104	73 - 122				
1,2,4-Trichlorobenzene	16.08	1.0	20	0	80.4	69 - 130				
1,2,4-Trimethylbenzene	23.57	1.0	20	0	118	76 - 124				
1,2-Dibromo-3-chloropropane	18.65	1.0	20	0	93.2	62 - 128				
1,2-Dibromoethane	22.59	1.0	20	0	113	77 - 121				
1,2-Dichlorobenzene	22.21	1.0	20	0	111	80 - 119				
1,2-Dichloroethane	24.11	1.0	20	0	121	73 - 128				
1,2-Dichloropropane	21.49	1.0	20	0	107	78 - 122				
1,3,5-Trimethylbenzene	24.41	1.0	20	0	122	75 - 124				
1,3-Dichlorobenzene	22.81	1.0	20	0	114	80 - 119				
1,3-Dichloropropane	21.29	1.0	20	0	106	80 - 119				
1,4-Dichlorobenzene	22.35	1.0	20	0	112	79 - 118				
2,2-Dichloropropane	23.74	1.0	20	0	119	60 - 139				
2-Butanone	40.69	2.0	40	0	102	56 - 143				
2-Chlorotoluene	23.32	1.0	20	0	117	79 - 122				
2-Hexanone	40.6	2.0	40	0	101	57 - 139				
4-Chlorotoluene	23.12	1.0	20	0	116	78 - 122				
4-Isopropyltoluene	22.75	1.0	20	0	114	77 - 127				
4-Methyl-2-pentanone	42.27	2.0	40	0	106	67 - 130				
Acetone	48.23	2.0	40	0	121	39 - 160				
Benzene	22.1	1.0	20	0	110	79 - 120				
Bromobenzene	23.12	1.0	20	0	116	80 - 120				
Bromochloromethane	21.42	1.0	20	0	107	78 - 123				
Bromodichloromethane	24.21	1.0	20	0	121	79 - 125				
Bromoform	23.77	1.0	20	0	119	66 - 130				
Bromomethane	21.22	1.0	20	0	106	53 - 141				

ALS Houston, US Date: 27-Feb-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi Weekly Samples
WorkOrder: HS20020835

QC BATCH REPORT

Batch ID: R356766 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

LCS Sample ID: **VLCSW-200221** Units: **UG/L** Analysis Date: **21-Feb-2020 13:09**
Client ID: Run ID: **VOA6_356766** SeqNo: **5482492** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	41.3	2.0	40	0	103	64 - 133				
Carbon tetrachloride	23.39	1.0	20	0	117	72 - 136				
Chlorobenzene	22.75	1.0	20	0	114	82 - 118				
Chloroethane	20.34	1.0	20	0	102	60 - 138				
Chloroform	21.14	1.0	20	0	106	79 - 124				
Chloromethane	19.14	1.0	20	0	95.7	50 - 139				
cis-1,2-Dichloroethene	20.88	1.0	20	0	104	78 - 123				
cis-1,3-Dichloropropene	22.37	1.0	20	0	112	75 - 124				
Dibromochloromethane	23.32	1.0	20	0	117	74 - 126				
Dibromomethane	22.68	1.0	20	0	113	79 - 123				
Dichlorodifluoromethane	19.78	1.0	20	0	98.9	32 - 152				
Ethylbenzene	23.64	1.0	20	0	118	79 - 121				
Hexachlorobutadiene	18.7	1.0	20	0	93.5	66 - 134				
Isopropylbenzene	24.24	1.0	20	0	121	72 - 131				
m,p-Xylene	46.32	2.0	40	0	116	80 - 121				
Methylene chloride	21.05	2.0	20	0	105	74 - 124				
Naphthalene	16.08	1.0	20	0	80.4	61 - 128				
n-Butylbenzene	21.61	1.0	20	0	108	75 - 128				
n-Propylbenzene	23.38	1.0	20	0	117	76 - 126				
o-Xylene	23.74	1.0	20	0	119	78 - 122				
sec-Butylbenzene	23.5	1.0	20	0	117	77 - 126				
Styrene	23.7	1.0	20	0	119	78 - 123				
tert-Butylbenzene	24.02	1.0	20	0	120	78 - 124				
Tetrachloroethene	24.56	1.0	20	0	123	74 - 129				
Toluene	22.84	1.0	20	0	114	80 - 121				
trans-1,2-Dichloroethene	21.94	1.0	20	0	110	75 - 124				
trans-1,3-Dichloropropene	23.48	1.0	20	0	117	73 - 127				
Trichloroethene	22.97	1.0	20	0	115	79 - 123				
Trichlorofluoromethane	23.63	1.0	20	0	118	65 - 141				
Vinyl chloride	19.95	1.0	20	0	99.8	58 - 137				
Surr: 1,2-Dichloroethane-d4	*53.29*	*1.0*	*50*	*0*	*107*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*52.95*	*1.0*	*50*	*0*	*106*	*85 - 114*				
Surr: Dibromofluoromethane	*52.72*	*1.0*	*50*	*0*	*105*	*80 - 119*				
Surr: Toluene-d8	*53.22*	*1.0*	*50*	*0*	*106*	*89 - 112*				

ALS Houston, US Date: 27-Feb-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi Weekly Samples
WorkOrder: HS20020835

QC BATCH REPORT

Batch ID: R356766 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS20020835-01MS** Units: **UG/L** Analysis Date: **21-Feb-2020 19:09**
Client ID: **LH18/24-SP650_021920** Run ID: **VOA6_356766** SeqNo: **5483336** 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	21.76	1.0	20	0	109	78 - 124				
1,1,1-Trichloroethane	20.5	1.0	20	0	102	74 - 131				
1,1,2,2-Tetrachloroethane	18.68	1.0	20	0	93.4	71 - 121				
1,1,2-Trichloroethane	19.74	1.0	20	0	98.7	80 - 119				
1,1-Dichloroethane	17.45	1.0	20	0	87.3	77 - 125				
1,1-Dichloroethene	15.95	1.0	20	0	79.7	71 - 131				
1,1-Dichloropropene	19.63	1.0	20	0	98.1	78 - 125				
1,2,3-Trichlorobenzene	14.47	1.0	20	0	72.4	69 - 129				
1,2,3-Trichloropropane	19.51	1.0	20	0	97.6	73 - 122				
1,2,4-Trichlorobenzene	15.09	1.0	20	0	75.4	69 - 130				
1,2,4-Trimethylbenzene	21.77	1.0	20	0	109	76 - 124				
1,2-Dibromo-3-chloropropane	18.03	1.0	20	0	90.2	62 - 128				
1,2-Dibromoethane	20.53	1.0	20	0	103	77 - 121				
1,2-Dichlorobenzene	19.92	1.0	20	0	99.6	80 - 119				
1,2-Dichloroethane	21.8	1.0	20	1.252	103	73 - 128				
1,2-Dichloropropane	18.14	1.0	20	0	90.7	78 - 122				
1,3,5-Trimethylbenzene	22.61	1.0	20	0	113	75 - 124				
1,3-Dichlorobenzene	21.12	1.0	20	0	106	80 - 119				
1,3-Dichloropropane	19.22	1.0	20	0	96.1	80 - 119				
1,4-Dichlorobenzene	20.29	1.0	20	0	101	79 - 118				
2,2-Dichloropropane	18.99	1.0	20	0	95.0	60 - 139				
2-Butanone	32.34	2.0	40	0	80.8	56 - 143				
2-Chlorotoluene	21.21	1.0	20	0	106	79 - 122				
2-Hexanone	37.66	2.0	40	0	94.2	57 - 139				
4-Chlorotoluene	21.6	1.0	20	0	108	78 - 122				
4-Isopropyltoluene	21.14	1.0	20	0	106	77 - 127				
4-Methyl-2-pentanone	37.36	2.0	40	0	93.4	67 - 130				
Acetone	32.35	2.0	40	0	80.9	39 - 160				
Benzene	19	1.0	20	0	95.0	79 - 120				
Bromobenzene	21.43	1.0	20	0	107	80 - 120				
Bromochloromethane	17.6	1.0	20	0	88.0	78 - 123				
Bromodichloromethane	20.13	1.0	20	0	101	79 - 125				
Bromoform	21.38	1.0	20	0	107	66 - 130				
Bromomethane	14.06	1.0	20	0	70.3	53 - 141				

ALS Houston, US Date: 27-Feb-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi Weekly Samples
WorkOrder: HS20020835

QC BATCH REPORT

Batch ID: R356766 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS20020835-01MS** Units: **UG/L** Analysis Date: **21-Feb-2020 19:09**
Client ID: **LH18/24-SP650_021920** Run ID: **VOA6_356766** SeqNo: **5483336** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	29.16	2.0	40	0	72.9	64 - 133				
Carbon tetrachloride	21.41	1.0	20	0	107	72 - 136				
Chlorobenzene	21.02	1.0	20	0	105	82 - 118				
Chloroethane	19.15	1.0	20	0	95.8	60 - 138				
Chloroform	17.58	1.0	20	0	87.9	79 - 124				
Chloromethane	7.939	1.0	20	0	39.7	50 - 139				S
cis-1,2-Dichloroethene	42.07	1.0	20	23.82	91.2	78 - 123				
cis-1,3-Dichloropropene	19.01	1.0	20	0	95.0	75 - 124				
Dibromochloromethane	21.31	1.0	20	0	107	74 - 126				
Dibromomethane	19.16	1.0	20	0	95.8	79 - 123				
Dichlorodifluoromethane	4.762	1.0	20	0	23.8	32 - 152				S
Ethylbenzene	21.36	1.0	20	0	107	79 - 121				
Hexachlorobutadiene	19.38	1.0	20	0	96.9	66 - 134				
Isopropylbenzene	22.39	1.0	20	0	112	72 - 131				
m,p-Xylene	42.96	2.0	40	0	107	80 - 121				
Methylene chloride	18.14	2.0	20	1.067	85.4	74 - 124				
Naphthalene	13.78	1.0	20	0	68.9	61 - 128				
n-Butylbenzene	19.99	1.0	20	0	100.0	75 - 128				
n-Propylbenzene	22	1.0	20	0	110	76 - 126				
o-Xylene	21.25	1.0	20	0	106	78 - 122				
sec-Butylbenzene	22.38	1.0	20	0	112	77 - 126				
Styrene	21.16	1.0	20	0	106	78 - 123				
tert-Butylbenzene	22.94	1.0	20	0	115	78 - 124				
Tetrachloroethene	23.37	1.0	20	0	117	74 - 129				
Toluene	20.9	1.0	20	0	104	80 - 121				
trans-1,2-Dichloroethene	17.65	1.0	20	0	88.2	75 - 124				
trans-1,3-Dichloropropene	19.25	1.0	20	0	96.2	73 - 127				
Trichloroethene	25.5	1.0	20	4.983	103	79 - 123				
Trichlorofluoromethane	17.93	1.0	20	0	89.7	65 - 141				
Vinyl chloride	10.06	1.0	20	0	50.3	58 - 137				S
Surr: 1,2-Dichloroethane-d4	*49.17*	*1.0*	*50*	*0*	*98.3*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*51.17*	*1.0*	*50*	*0*	*102*	*85 - 114*				
Surr: Dibromofluoromethane	*47.79*	*1.0*	*50*	*0*	*95.6*	*80 - 119*				
Surr: Toluene-d8	*54.63*	*1.0*	*50*	*0*	*109*	*89 - 112*				

ALS Houston, US Date: 27-Feb-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi Weekly Samples
WorkOrder: HS20020835

QC BATCH REPORT

Batch ID: R356766 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MSD Sample ID: **HS20020835-01MSD** Units: **UG/L** Analysis Date: **21-Feb-2020 19:34**
Client ID: **LH18/24-SP650_021920** Run ID: **VOA6_356766** SeqNo: **5483337** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	21.22	1.0	20	0	106	78 - 124	21.76	2.51	20	
1,1,1-Trichloroethane	20.18	1.0	20	0	101	74 - 131	20.5	1.56	20	
1,1,2,2-Tetrachloroethane	19.4	1.0	20	0	97.0	71 - 121	18.68	3.74	20	
1,1,2-Trichloroethane	19.46	1.0	20	0	97.3	80 - 119	19.74	1.43	20	
1,1-Dichloroethane	17.02	1.0	20	0	85.1	77 - 125	17.45	2.5	20	
1,1-Dichloroethene	15.66	1.0	20	0	78.3	71 - 131	15.95	1.79	20	
1,1-Dichloropropene	19.1	1.0	20	0	95.5	78 - 125	19.63	2.71	20	
1,2,3-Trichlorobenzene	18.88	1.0	20	0	94.4	69 - 129	14.47	26.4	20	R
1,2,3-Trichloropropane	19.85	1.0	20	0	99.3	73 - 122	19.51	1.72	20	
1,2,4-Trichlorobenzene	18.2	1.0	20	0	91.0	69 - 130	15.09	18.7	20	
1,2,4-Trimethylbenzene	22.23	1.0	20	0	111	76 - 124	21.77	2.07	20	
1,2-Dibromo-3-chloropropane	19.18	1.0	20	0	95.9	62 - 128	18.03	6.15	20	
1,2-Dibromoethane	20.21	1.0	20	0	101	77 - 121	20.53	1.6	20	
1,2-Dichlorobenzene	20.62	1.0	20	0	103	80 - 119	19.92	3.47	20	
1,2-Dichloroethane	21.13	1.0	20	1.252	99.4	73 - 128	21.8	3.14	20	
1,2-Dichloropropane	17.68	1.0	20	0	88.4	78 - 122	18.14	2.52	20	
1,3,5-Trimethylbenzene	22.93	1.0	20	0	115	75 - 124	22.61	1.43	20	
1,3-Dichlorobenzene	21.47	1.0	20	0	107	80 - 119	21.12	1.65	20	
1,3-Dichloropropane	19.67	1.0	20	0	98.3	80 - 119	19.22	2.3	20	
1,4-Dichlorobenzene	20.88	1.0	20	0	104	79 - 118	20.29	2.86	20	
2,2-Dichloropropane	17.92	1.0	20	0	89.6	60 - 139	18.99	5.8	20	
2-Butanone	31.63	2.0	40	0	79.1	56 - 143	32.34	2.23	20	
2-Chlorotoluene	21.67	1.0	20	0	108	79 - 122	21.21	2.13	20	
2-Hexanone	36.41	2.0	40	0	91.0	57 - 139	37.66	3.39	20	
4-Chlorotoluene	21.65	1.0	20	0	108	78 - 122	21.6	0.216	20	
4-Isopropyltoluene	21.43	1.0	20	0	107	77 - 127	21.14	1.4	20	
4-Methyl-2-pentanone	38.3	2.0	40	0	95.7	67 - 130	37.36	2.47	20	
Acetone	31.57	2.0	40	0	78.9	39 - 160	32.35	2.45	20	
Benzene	18.28	1.0	20	0	91.4	79 - 120	19	3.89	20	
Bromobenzene	21.82	1.0	20	0	109	80 - 120	21.43	1.83	20	
Bromochloromethane	17.11	1.0	20	0	85.6	78 - 123	17.6	2.82	20	
Bromodichloromethane	19.46	1.0	20	0	97.3	79 - 125	20.13	3.4	20	
Bromoform	21.59	1.0	20	0	108	66 - 130	21.38	0.986	20	
Bromomethane	13.4	1.0	20	0	67.0	53 - 141	14.06	4.77	20	

ALS Houston, US Date: 27-Feb-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi Weekly Samples
WorkOrder: HS20020835

QC BATCH REPORT

Batch ID: R356766 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MSD Sample ID: **HS20020835-01MSD** Units: **UG/L** Analysis Date: **21-Feb-2020 19:34**
Client ID: **LH18/24-SP650_021920** Run ID: **VOA6_356766** SeqNo: **5483337** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Carbon disulfide	28.4	2.0	40	0	71.0	64 - 133	29.16	2.65	20	
Carbon tetrachloride	20.37	1.0	20	0	102	72 - 136	21.41	5	20	
Chlorobenzene	20.3	1.0	20	0	101	82 - 118	21.02	3.49	20	
Chloroethane	16.44	1.0	20	0	82.2	60 - 138	19.15	15.2	20	
Chloroform	17.07	1.0	20	0	85.3	79 - 124	17.58	2.97	20	
Chloromethane	7.634	1.0	20	0	38.2	50 - 139	7.939	3.92	20	S
cis-1,2-Dichloroethene	41.01	1.0	20	23.82	86.0	78 - 123	42.07	2.54	20	
cis-1,3-Dichloropropene	18.6	1.0	20	0	93.0	75 - 124	19.01	2.19	20	
Dibromochloromethane	21.18	1.0	20	0	106	74 - 126	21.31	0.613	20	
Dibromomethane	19.38	1.0	20	0	96.9	79 - 123	19.16	1.18	20	
Dichlorodifluoromethane	4.554	1.0	20	0	22.8	32 - 152	4.762	4.45	20	S
Ethylbenzene	20.76	1.0	20	0	104	79 - 121	21.36	2.87	20	
Hexachlorobutadiene	21.45	1.0	20	0	107	66 - 134	19.38	10.1	20	
Isopropylbenzene	21.81	1.0	20	0	109	72 - 131	22.39	2.64	20	
m,p-Xylene	41.69	2.0	40	0	104	80 - 121	42.96	2.99	20	
Methylene chloride	17.27	2.0	20	1.067	81.0	74 - 124	18.14	4.96	20	
Naphthalene	18.54	1.0	20	0	92.7	61 - 128	13.78	29.5	20	R
n-Butylbenzene	20.79	1.0	20	0	104	75 - 128	19.99	3.92	20	
n-Propylbenzene	22.04	1.0	20	0	110	76 - 126	22	0.175	20	
o-Xylene	21.15	1.0	20	0	106	78 - 122	21.25	0.471	20	
sec-Butylbenzene	22.72	1.0	20	0	114	77 - 126	22.38	1.53	20	
Styrene	21.08	1.0	20	0	105	78 - 123	21.16	0.407	20	
tert-Butylbenzene	23.16	1.0	20	0	116	78 - 124	22.94	0.969	20	
Tetrachloroethene	22.59	1.0	20	0	113	74 - 129	23.37	3.39	20	
Toluene	20.53	1.0	20	0	103	80 - 121	20.9	1.78	20	
trans-1,2-Dichloroethene	17.02	1.0	20	0	85.1	75 - 124	17.65	3.61	20	
trans-1,3-Dichloropropene	19.11	1.0	20	0	95.5	73 - 127	19.25	0.725	20	
Trichloroethene	24.29	1.0	20	4.983	96.5	79 - 123	25.5	4.87	20	
Trichlorofluoromethane	17.12	1.0	20	0	85.6	65 - 141	17.93	4.61	20	
Vinyl chloride	9.102	1.0	20	0	45.5	58 - 137	10.06	10	20	S
Surr: 1,2-Dichloroethane-d4	*47.82*	*1.0*	*50*	*0*	*95.6*	*81 - 118*	*49.17*	*2.8*	*20*	
Surr: 4-Bromofluorobenzene	*50.72*	*1.0*	*50*	*0*	*101*	*85 - 114*	*51.17*	*0.895*	*20*	
Surr: Dibromofluoromethane	*47.88*	*1.0*	*50*	*0*	*95.8*	*80 - 119*	*47.79*	*0.192*	*20*	
Surr: Toluene-d8	*54.39*	*1.0*	*50*	*0*	*109*	*89 - 112*	*54.63*	*0.436*	*20*	

ALS Houston, US Date: 27-Feb-20

Client:	Bhate Environmental Associates, Inc.
Project:	Longhorn GW Treatment Plant Bi Weekly Samples
WorkOrder:	HS20020835

QC BATCH REPORT

Batch ID:	**R356766 (0)**	**Instrument:**	**VOA6**	**Method:**	**VOLATILES ORGANICS BY METHOD 8260C**

The following samples were analyzed in this batch:	HS20020835-01	HS20020835-02

ALS Houston, US Date: 27-Feb-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi Weekly Samples
WorkOrder: HS20020835

QC BATCH REPORT

Batch ID: R357033 (0) **Instrument: ICS-Integrion** **Method: ANIONS BY SW9056A**

MBLK Sample ID: **WBLKW1-022520** Units: **mg/L** Analysis Date: **25-Feb-2020 12:31**
Client ID: Run ID: **ICS-Integrion_357033** SeqNo: **5488058** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	0.500	0.500								U
Sulfate	0.500	0.500								U

LCS Sample ID: **WLCSW1-022520** Units: **mg/L** Analysis Date: **25-Feb-2020 12:49**
Client ID: Run ID: **ICS-Integrion_357033** SeqNo: **5488059** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	19.93	0.500	20	0	99.7	80 - 120				
Sulfate	19.8	0.500	20	0	99.0	80 - 120				

LCSD Sample ID: **WLCSDW1-022520** Units: **mg/L** Analysis Date: **25-Feb-2020 13:07**
Client ID: Run ID: **ICS-Integrion_357033** SeqNo: **5488060** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	19.93	0.500	20	0	99.7	80 - 120	19.93	0	20	
Sulfate	19.81	0.500	20	0	99.1	80 - 120	19.8	0.0788	20	

MS Sample ID: **HS20020828-08MS** Units: **mg/L** Analysis Date: **25-Feb-2020 22:13**
Client ID: Run ID: **ICS-Integrion_357033** SeqNo: **5488076** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	119.2	5.00	100	22.42	96.8	80 - 120				
Sulfate	94.81	5.00	100	0	94.8	80 - 120				

MS Sample ID: **HS20020828-08MS** Units: **mg/L** Analysis Date: **25-Feb-2020 20:42**
Client ID: Run ID: **ICS-Integrion_357033** SeqNo: **5488071** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	32.16	0.500	10	22.78	93.8	80 - 120				
Sulfate	9.427	0.500	10	0.1787	92.5	80 - 120				

ALS Houston, US Date: 27-Feb-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi Weekly Samples
WorkOrder: HS20020835

QC BATCH REPORT

Batch ID: R357033 (0) **Instrument: ICS-Integrion** **Method: ANIONS BY SW9056A**

MSD Sample ID: **HS20020828-08MSD** Units: **mg/L** Analysis Date: **25-Feb-2020 22:31**
Client ID: Run ID: **ICS-Integrion_357033** SeqNo: **5488077** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	120.3	5.00	100	22.42	97.8	80 - 120	119.2	0.885	20	
Sulfate	96.39	5.00	100	0	96.4	80 - 120	94.81	1.65	20	

MSD Sample ID: **HS20020828-08MSD** Units: **mg/L** Analysis Date: **25-Feb-2020 21:00**
Client ID: Run ID: **ICS-Integrion_357033** SeqNo: **5488072** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	32.36	0.500	10	22.78	95.8	80 - 120	32.16	0.608	20	
Sulfate	9.62	0.500	10	0.1787	94.4	80 - 120	9.427	2.03	20	

The following samples were analyzed in this batch: HS20020835-01

ALS Houston, US Date: 27-Feb-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi Weekly Samples
WorkOrder: **HS20020835**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

Unit Reported	Description
mg/L	Milligrams per Liter

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	19-028-0	27-Mar-2020
California	2919, 2019-2020	30-Apr-2020
Dept of Defense	ANAB L2231 V009	22-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	624-2020	31-Dec-2020
North Dakota	R-193 2019-2020	30-Apr-2020
Oklahoma	2019-067	31-Aug-2020
Texas	T104704231-19-25	30-Apr-2020

ALS Houston, US Date: 27-Feb-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi Weekly Samples
Work Order: HS20020835

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS20020835-01	LH18/24-SP650_021920	Login	2/20/2020 12:41:55 PM	NDR	WET354
HS20020835-01	LH18/24-SP650_021920	Login	2/20/2020 12:41:55 PM	NDR	VOA118
HS20020835-02	Trip Blank	Login	2/20/2020 12:41:55 PM	NDR	VOA118

ALS Houston, US Date: 27-Feb-20

Sample Receipt Checklist

Client Name: Bhate Environmental
Work Order: HS20020835
Date/Time Received: **20-Feb-2020 08:55**
Received by: **NDR**

Checklist completed by: *Nilesh D. Ranchod* eSignature 20-Feb-2020 Date
Reviewed by: *RJ Modashia* eSignature 20-Feb-2020 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 ☐	COC IDs:None
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	

Temperature(s)/Thermometer(s):	0.5c U/C	IR25
Cooler(s)/Kit(s):	45501	
Date/Time sample(s) sent to storage:	2/20/2020 13:00	

Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

CHAIN OF CUSTODY

Name Of Lab Shipping To: ALS 10450 Stancliff Rd. Suite 210, Houston, Tx. 77099 ATTN: R.J. Modashia

Project: BHATE LONGHORN ARMY AMMN. PLANT (LHAAP) GROUNDWATER TREATMENT PLANT (GWTP) KARNACK, TEXAS	Project No. NWO1312.0150.0 16.0001
Job: **GROUNDWATER TREATMENT PLANT BI-WEEKLY SAMPLES**	
Prepared By: Scott Beesinger	P.O Number

Field Sample I.D.	Sample Matrix	Date / Time	MS / MSD	No. OF CONTAINERS	Analyses: VOC	Analyses: CHLORIDE, SULFATE	Remarks (Preservatives, etc.)	Lab I.D.#
LH18/24-SP650_021920	Water	02/19/20 / 14:00		3	3		HCL	
LH18/24-SP650_021920	Water	02/19/20 / 14:00		1		1	NONE	
Trip Blank	Water	02/19/20		2	2		HCL	

HS20020835

Bhate Environmental Associates, Inc.
Longhorn GW Treatment Plant Bi Weekly Samples

Additional Remarks: **Standard TAT on Chloride & Sulfate. 24 Hour TAT on VOC**

Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
Scott Beesinger	02/19/20	14:30	NA	2.20.20	08:55						

9For Lab Use Only

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

Remarks

45501 Temp IR 0.5
IR #25

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

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

45501

CUSTODY SEAL

Date: 2/19/20 Time: 1430
Name: Scott Beesinger
Company: Bhate

Seal Broken By: SBM
Date: 02/20/20

45501 FEB 20 2020

Must Deliver Next Business Day
Time and Tempature Sensitive!

45501

ORIGIN ID:SGRA (903) 930-6193
SCOTT BEESINGER
APTIM ENVIROMENTAL & INFASTRUCTURE
1203-B EAST GRAND AVE
PMB 202
MARSHALL, TX 75670
UNITED STATES US

SHIP DATE: 17OCT18
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) 530-5656
REF: LHAAP 67 - RJ

RMA:

FedEx Express

FedEx
TRK# 0221 4380 9533 6747

THU - 20 FEB 10:30A
PRIORITY OVERNIGHT

77099
TX-US
IAH

AB SGRA

FID 3866960 19FEB20 GGGA 56AC2/049E/05A2

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

March 12, 2020

Marcia Olive
Bhate Environmental Associates, Inc.
445 Union Blvd Ste 129
Lakewood, CO 80228

Work Order: **HS20021115**

Laboratory Results for: **Longhorn GW Treatment Plant Weekly Samples**

Dear Marcia,

ALS Environmental received 2 sample(s) on Feb 26, 2020 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: 12-Mar-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Weekly Samples
Work Order: HS20021115

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS20021115-01	LH18/24-SP650_022520	Water		25-Feb-2020 14:00	26-Feb-2020 09:00	☐
HS20021115-02	LH18/24-SP650_022520_BIX	Water		25-Feb-2020 14:00	26-Feb-2020 09:00	☐

ALS Houston, US Date: 12-Mar-20

Client: Bhate Environmental Associates, Inc. **CASE NARRATIVE**
Project: Longhorn GW Treatment Plant Weekly Samples
Work Order: HS20021115

Work Order Comments

• The analysis for Perchlorate was subcontracted to ALS Salt Lake City, UT. Final report attached.

The analysis for TOC was subcontracted to ALS Kelso, WA. Final report attached.

WetChemistry by Method E350.3

Batch ID: R357438

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

WetChemistry by Method E365.3

Batch ID: R357112

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

ALS Houston, US Date: 12-Mar-20

Client: Bhate Environmental Associates, Inc.
ANALYTICAL REPORT
Project: Longhorn GW Treatment Plant Weekly Samples
WorkOrder:HS20021115
Sample ID: LH18/24-SP650_022520
Lab ID:HS20021115-01
Collection Date: 25-Feb-2020 14:00
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
AMMONIA AS N BY E350.3(ISE)		**Method:E350.3**						Analyst: RG
Nitrogen, Ammonia (As N)	0.10	aU	0.20	0.10	0.20	mg/L	1	03-Mar-2020 12:00
ORTHO PHOSPHATE (PO4) AS P BY E365.3		**Method:E365.3**						Analyst: MZD
Phosphorus, Total Orthophosphate (As P)	**0.0110**	Ja	**0.0100**	**0.0250**	**0.0250**	**mg/L**	1	26-Feb-2020 17:00
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	05-Mar-2020 15:23

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

ALS Houston, US Date: 12-Mar-20

Client: Bhate Environmental Associates, Inc.
ANALYTICAL REPORT
Project: Longhorn GW Treatment Plant Weekly Samples
WorkOrder:HS20021115
Sample ID: LH18/24-SP650_022520_BIX
Lab ID:HS20021115-02
Collection Date: 25-Feb-2020 14:00
Matrix:Water

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	12-Mar-2020 09:29

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

ALS Houston, US Date: 12-Mar-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Weekly Samples
WorkOrder: HS20021115

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R357112 (0)	**Test Name :** ORTHO PHOSPHATE (PO4) AS P BY E365.3				**Matrix:** Water	
HS20021115-01	LH18/24-SP650_022520	25 Feb 2020 14:00			26 Feb 2020 17:00	1
Batch ID: R357438 (0)	**Test Name :** AMMONIA AS N BY E350.3(ISE)				**Matrix:** Water	
HS20021115-01	LH18/24-SP650_022520	25 Feb 2020 14:00			03 Mar 2020 12:00	1
Batch ID: R357989 (0)	**Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)				**Matrix:** Water	
HS20021115-02	LH18/24-SP650_022520_BIX	25 Feb 2020 14:00			12 Mar 2020 09:29	1
Batch ID: R358051 (0)	**Test Name :** SUBCONTRACT ANALYSIS - TOC ANALYSIS				**Matrix:** Water	
HS20021115-01	LH18/24-SP650_022520	25 Feb 2020 14:00			05 Mar 2020 15:23	1

ALS Houston, US Date: 12-Mar-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Weekly Samples
WorkOrder: HS20021115

QC BATCH REPORT

Batch ID: R357112 (0) **Instrument:** UV-2450 **Method:** ORTHO PHOSPHATE (PO4) AS P BY E365.3

MBLK Sample ID: **MBLK-R357112** Units: **mg/L** Analysis Date: **26-Feb-2020 17:00**
Client ID: Run ID: **UV-2450_357112** SeqNo: **5489871** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total Orthophosphate (As P)	0.0250	0.0250								U

LCS Sample ID: **LCS-R357112** Units: **mg/L** Analysis Date: **26-Feb-2020 17:00**
Client ID: Run ID: **UV-2450_357112** SeqNo: **5489870** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total Orthophosphate (As P)	0.226	0.0250	0.25	0	90.4	85 - 115				

LCSD Sample ID: **LCSD-R357112** Units: **mg/L** Analysis Date: **26-Feb-2020 17:00**
Client ID: Run ID: **UV-2450_357112** SeqNo: **5489869** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total Orthophosphate (As P)	0.215	0.0250	0.25	0	86.0	85 - 115	0.226	4.99	20	

MS Sample ID: **HS20021114-02MS** Units: **mg/L** Analysis Date: **26-Feb-2020 17:00**
Client ID: Run ID: **UV-2450_357112** SeqNo: **5489873** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total Orthophosphate (As P)	0.23	0.0250	0.25	-0.001	92.4	80 - 120				

MSD Sample ID: **HS20021114-02MSD** Units: **mg/L** Analysis Date: **26-Feb-2020 17:00**
Client ID: Run ID: **UV-2450_357112** SeqNo: **5489872** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total Orthophosphate (As P)	0.232	0.0250	0.25	-0.001	93.2	80 - 120	0.23	0.866	20	

The following samples were analyzed in this batch: HS20021115-01

ALS Houston, US Date: 12-Mar-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Weekly Samples
WorkOrder: HS20021115

QC BATCH REPORT

Batch ID: R357438 (0) **Instrument: WetChem_HS** **Method: AMMONIA AS N BY E350.3(ISE)**

MBLK Sample ID: **MBLK-R357438** Units: **mg/L** Analysis Date: **03-Mar-2020 12:00**
Client ID: Run ID: **WetChem_HS_357438** SeqNo: **5497032** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Ammonia (As N)	0.10	0.20								U

LCS Sample ID: **LCS-R357438** Units: **mg/L** Analysis Date: **03-Mar-2020 12:00**
Client ID: Run ID: **WetChem_HS_357438** SeqNo: **5497031** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Ammonia (As N)	10.19	0.20	10	0	102	80 - 120				

LCSD Sample ID: **LCSD-R357438** Units: **mg/L** Analysis Date: **03-Mar-2020 12:00**
Client ID: Run ID: **WetChem_HS_357438** SeqNo: **5497030** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Ammonia (As N)	10.21	0.20	10	0	102	80 - 120	10.19	0.206	20	

The following samples were analyzed in this batch: HS20021115-01

ALS Houston, US Date: 12-Mar-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Weekly Samples
WorkOrder: **HS20021115**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	19-028-0	27-Mar-2020
California	2919, 2019-2020	30-Apr-2020
Dept of Defense	ANAB L2231 V009	22-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	624-2020	31-Dec-2020
North Dakota	R-193 2019-2020	30-Apr-2020
Oklahoma	2019-067	31-Aug-2020
Texas	T104704231-19-25	30-Apr-2020

ALS Houston, US Date: 12-Mar-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Weekly Samples
Work Order: HS20021115

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS20021115-01	LH18/24-SP650_022520	Login	2/26/2020 11:44:33 AM	JRM	WET247
HS20021115-01	LH18/24-SP650_022520	Login	2/26/2020 11:44:33 AM	JRM	WET247
HS20021115-01	LH18/24-SP650_022520	Login	2/26/2020 11:44:33 AM	JRM	Sub
HS20021115-02	LH18/24-SP650_022520_BIX	Login	2/26/2020 11:44:33 AM	JRM	Sub

ALS Houston, US Date: 12-Mar-20

Sample Receipt Checklist

Client Name: Bhate Environmental
Work Order: HS20021115
Date/Time Received: **26-Feb-2020 09:00**
Received by: **AC**

Checklist completed by: *Jared R. Makan* eSignature 26-Feb-2020 Date
Reviewed by: *RJ Modashia* eSignature 26-Feb-2020 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 ☐	
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):	1.6°C/1.6°C UC/C	IR25
Cooler(s)/Kit(s):	45565	
Date/Time sample(s) sent to storage:	02/26/2020 11:50	

Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

CHAIN OF CUSTODY

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

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

Project No. NWO1312.0150.0 16.0001

Job: GROUNDWATER TREATMENT PLANT WEEKLY SAMPLES

Prepared By: Scott Beesinger

P.O. Number

Field Sample I.D.	Sample Matrix	Date / Time	MS / MSD	No. OF CONTAINERS	AMMONIA-N	TOTAL ORGANIC CARBON	ORTHO-PHOSPHATE	PERCHLORATE							Remarks (Preservatives, etc.)	Lab I.D.#
					Analyses											
LH18/24-SP650_022520	Water	02/25/20 / 14:00		3	X	X									H2SO4	
LH18/24-SP650_022520	Water	02/25/20 / 14:00		1			X								NONE	
LH18/24–SP650_022520_BIX	Water	02/25/20 / 14:00		1				X							NONE	

Additional Remarks: **Standard TAT on all parameters**

Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
Scott Beesinger	02/25/20	14:30	AC	2/26/2020	09:00						

For Lab Use Only

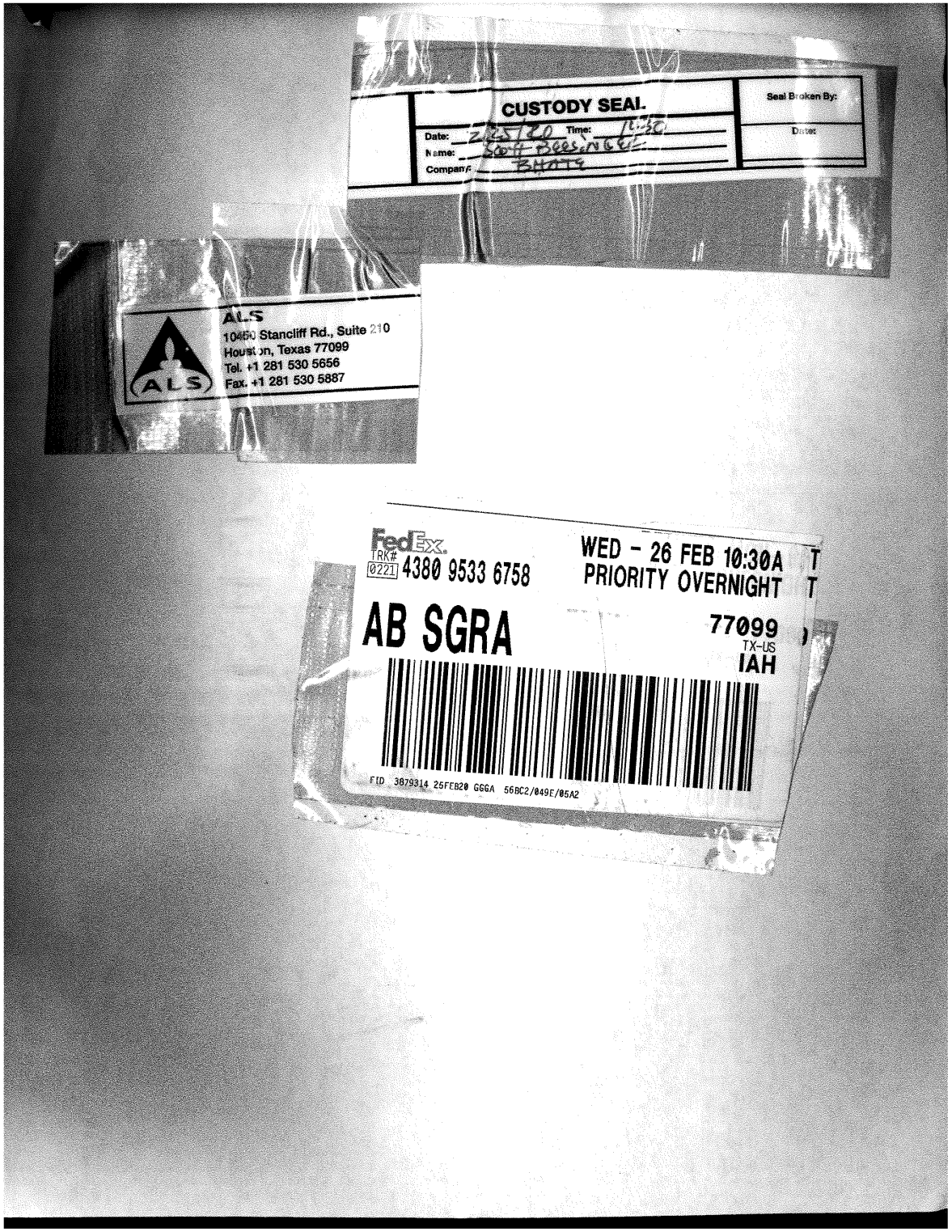
Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition

Remarks: J/C 1.6 IR#25 CF0.0 45565

HS20021115

Bhate Environmental Associates, Inc.
Longhorn GW Treatment Plant Weekly Samples

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


CUSTODY SEAL
Date:
Time:
Name:
Company:
Seal Broken By:
Date:
ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887
FedEx
TRK# 0221 4380 9533 6758
WED - 26 FEB 10:30A
PRIORITY OVERNIGHT
AB SGRA
77099
TX-US
IAH
FID 3879314 26FEB20 GGGA 56BC2/049E/05A2

March 11, 2020 Service Request No:E2000180

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

Laboratory Results for: HS20021115

Dear RJ,

Enclosed are the results of the sample(s) submitted to our laboratory February 26, 2020
For your reference, these analyses have been assigned our service request number **E2000180.**

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current TNI standards, where applicable, and except as noted in the laboratory case narrative provided. All results are intended to be considered in their entirety and ALS Environmental is not responsible for use of less than the complete final report. Results apply only to the items submitted to the laboratory, as received for analysis. In accordance with the current TNI Standard, a statement on the estimated uncertainty of measurement of any quantitative analysis will be supplied upon request.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Corey Grandits
Project Manager

ADDRESS 10450 Stancliff Rd., Suite 210, Houston, TX 77099
PHONE +1 281 530 5656 | FAX +1 281 530 5887
ALS Group USA, Corp.
dba ALS Environmental

Certificate of Analysis

ALS Environmental - Houston HRMS
10450 Stancliff Rd, Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

ALS Environmental

Client:	ALS Houston	**Service Request No.:**	E2000180
Project:	HS20021115	**Date Received:**	02/26/20
Sample Matrix:	W		

CASE NARRATIVE

All analyses were performed in adherence to the quality assurance program of ALS Environmental. This report contains analytical results for samples designated for Tier IV. When appropriate to the method, method blank results have been reported with each analytical test.

Sample Receipt

One sample was received for analysis at ALS Environmental in Houston on 02/26/20.

The sample was received in good condition and is consistent with the accompanying chain of custody form. The sample was stored in a refrigerator at 4°C upon receipt at the laboratory.

Data Validation Notes and Discussion

Precision and Accuracy:

EQ2000089: Laboratory Control Spike/Duplicate Laboratory Control Spike (LCS/DLCS) samples were analyzed and reported in lieu of a MS/MSD for this extraction batch. The LCS and DLCS recoveries are within QC limits.

Certification is held for DoD for the method/matrix/analytes provided in this report.

The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and ALS Environmental (ALS) is not responsible for utilization of less than the complete report.

Use of ALS group USA Corp dba ALS Environmental (ALS)'s Name. Client shall not use ALS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to ALS any test result, tolerance or specification derived from ALS's data ("Attribution") without ALS's prior written consent, which may be withheld by ALS for any reason in its sole discretion. To request ALS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If ALS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use ALS's name or trademark in any Materials or Attribution shall be deemed denied. ALS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of ALS's name or trademark may cause ALS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.

Client: ALS Environmental - US **Service Request:**E2000180
Project: HS20021115

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
E2000180-001	LH18/24-SP650_022520_BIX	2/25/2020	1400

Service Request Summary

Folder #: **E2000180**
Client Name: ALS Environmental - US
Project Name: HS20021115
Project Number:

Report To: RJ Modashia
ALS Laboratory Group
10450 Stancliff Road
Houston, TX 77099-4338
USA
Phone Number: 281-530-5656
Cell Number:
Fax Number: 281-530-5887
E-mail: rj.modashia@alsglobal.com

Project Chemist: Corey Grandits
Originating Lab: HOUSTON
Logged By: CGRANDITS
Date Received: 02/26/20
Internal Due Date: 3/11/2020
QAP: LAB QAP
Qualifier Set: Lab Standard
Formset: Lab Standard
Merged?: Y
Report to MDL?: Y
P.O. Number: HS20021115
EDD: No EDD Specified

1 250 mL-Plastic Bottle HDPE WM CLEAR Unpreserved
Location: EHRMS-WIC 7B
Pressure Gas:

Lab Samp No.	Client Samp No	Matrix	Collected	HOUSTON ClO4 DOD/6850
E2000180-001	LH18/24-SP650_022520_BIX	Water	02/25/20 1400	**IV**

Service Request Summary

Folder #: **E2000180**
Client Name: ALS Environmental - US
Project Name: HS20021115
Project Number:

Report To: RJ Modashia
ALS Laboratory Group
10450 Stancliff Road
Houston, TX 77099-4338
USA
Phone Number: 281-530-5656
Cell Number:
Fax Number: 281-530-5887
E-mail: rj.modashia@alsglobal.com

Project Chemist: Corey Grandits
Originating Lab: HOUSTON
Logged By: CGRANDITS
Date Received: 02/26/20
Internal Due Date: 3/11/2020
QAP: LAB QAP
Qualifier Set: Lab Standard
Formset: Lab Standard
Merged?: Y
Report to MDL?: Y
P.O. Number: HS20021115
EDD: No EDD Specified

1 250 mL-Plastic Bottle HDPE WM CLEAR Unpreserved
Location: EHRMS-WIC 7B
Pressure Gas:

Data Qualifiers

Lab Standard

+	Possible Tedlar bag artifact.
A	TIC is a suspected aldol-condensation product
B	Analyte found in the associated method blank as well as in the sample.
BC	Reported results are not blank corrected.
BH	The back section of the tube yielded higher results than the front.
BT	Results indicated possible breakthrough; back section >=10% front section.
C	Result identification confirmed.
D	Compound identified in an analysis at a secondary dilution factor
D	Spike was diluted out
DE	Reported results are corrected for desorption efficiency.
E	Estimated value. Concentration above calibration range
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
H1	Sample analysis performed past holding time. See case narrative.
H2	Initial analysis within holding time. Reanalysis for the required dilution was past holding time.
H3	Sample was received and analyzed past holding time.
H4	Sample was extracted past required extraction holding time, but analyzed within analysis holding time. See case narrative.
I	Internal standard not within the specified limits. See case narrative.
J	Estimated Value. Concentration found below MRL.
K	A deflection in the QC ion may indicate interference with the quantitation of this ion. The concentration of this analyte should be considered as an estimate.
K	Analyte was detected above the method reporting limit prior to normalization.
L1	Laboratory control sample recovery outside the specified limits; results may be biased high.
L2	Laboratory control sample recovery outside the specified limits; results may be biased low.
L3	Laboratory control sample recovery outside the specified limits.
M	Matrix interference; results may be biased high.
M	The duplicate injection precision not met.
M1	Matrix interference due to coelution with a non-target compound; results may be biased high.
N	Presumptive evidence of a compound for TICs that have been identified based on a mass spectral library search.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.
P	Indicates chlorodiphenyl ether interference present at the retention time of the target compound.
P	Pesticide/Aroclor target analyte > 40% difference for detected concentrations between GC columns
Q	Indicates as estimated value because the P and P + 2 theoretical abundance ratio does not meet method criteria.
R	Duplicate Precision not met.
R1	Duplicate precision not within the specified limits; however, the results are below the MRL and considered estimated.
S	Surrogate recovery not within specified limits.

Data Qualifiers

Lab Standard

S	The reported value was determined by the Method of Standard Additions (MSA).
T	Analyte is a tentatively identified compound, result is estimated.
U	Compound was analyzed for, but was not detected (ND).
V1	The continuing calibration verification standard was outside (biased high) the specified limits for this compound.
V2	The continuing calibration verification standard was outside (biased low) the specified limits for this compound.
W	Result quantified, but the corresponding peak was detected outside the generated retention time window.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
X	See case narrative.
Y	Recovery outside limits
Y	The chromatogram resembles a petroleum product but does not match the calibration standard.
Z	The chromatogram does not resemble a petroleum product.
i	The MRL/MDL has been elevated due to a matrix interference.

ALS Laboratory Group

Acronyms

Cal	Calibration
Conc	CONCentration
Dioxin(s)	Polychlorinated dibenzo-p-dioxin(s)
EDL	Estimated Detection Limit
EMPC	Estimated Maximum Possible Concentration
Flags	Data qualifiers
Furan(s)	Polychlorinated dibenzofuran(s)
g	Grams
ICAL	Initial CALibration
ID	IDentifier
Ions	Masses monitored for the analyte during data acquisition
L	Liter (s)
LCS	Laboratory Control Sample
DLCS	Duplicate Laboratory Control Sample
MB	Method Blank
MCL	Method Calibration Limit
MDL	Method Detection Limit
mL	Milliliters
MS	Matrix Spiked sample
DMS	Duplicate Matrix Spiked sample
NO	Number of peaks meeting all identification criteria
PCDD(s)	Polychlorinated dibenzo-p-dioxin(s)
PCDF(s)	Polychlorinated dibenzofuran(s)
ppb	Parts per billion
ppm	Parts per million
ppq	Parts per quadrillion
ppt	Parts per trillion
QA	Quality Assurance
QC	Quality Control
Ratio	Ratio of areas from monitored ions for an analyte
% Rec.	Percent recovery
RPD	Relative Percent Difference
RRF	Relative Response Factor
RT	Retention Time
SDG	Sample Delivery Group
S/N	Signal-to-noise ratio
TEF	Toxicity Equivalence Factor
TEQ	Toxicity Equivalence Quotient

10450 Stancliff Rd, Houston, TX 77099 | 281-530-5656 | www.alsglobal.com

ALS Environmental

State Certifications, Accreditations, and Licenses

Agency	Number	Expire Date
Arizona Department of Health Services	AZ0793	5/27/2020
Arkansas Department of Environmental Quality	19-028-0	3/27/2020
California Department of Health Services	2919	4/30/2020
Department of Defense	A2LA 2897.01	11/30/2021
Florida Department of Health	E87611	6/30/2020
Hawaii Department of Health	TX02694	4/30/2020
Illinois Environmental Protection Agency	2000322019-2	5/9/2020
Kansas Department of Health and Environment	E-10352	7/31/2020
Louisiana Department of Environmental Quality	03087	6/30/2020
Louisiana Department of Health and Hospitals	LA028-2020	12/31/2020
Maine Center for Disease Control and Prevention	201815	6/5/2020
Maryland Department of the Environment	343	6/30/2020
Minnesota Department of Health	1785988	12/31/2020
Nebraska Department of Health and Human Services	NE-OS-25-13	4/30/2020
Nevada Department of Concervation and Natural Resources	TX026932019-1	7/31/2020
New Hampshire Environmental Laboratory Accreditation Program	209419	4/24/2020
New Jersey Department of Environmental Protection	NLC190001	6/30/2020
New York Department of Health	11707	3/31/2020
Oklahoma Department of Environmental Quality	2019-067	8/31/2020
Pennsylvania Department of Environmental Protection	68-03441-013	6/30/2020
Tennessee Department of Environment and Concervation	04016	6/30/2020
Texas Commision on Environmental Quality	TX104704231-19-25	4/30/2020
United States Department of Agriculture	P330-19-00299	10/10/2022
Utah Department of Health Environmental Laboratory Certification	TX026932019-9	7/31/2020
Washington Department of Health	C819	11/14/2020
West Virginia Department of Environmental Protection	347	6/30/2020

Chain of Custody

ALS Environmental - Houston HRMS
10450 Stancliff Rd, Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

E2000180 5
ALS Laboratory Group
HS20021115

10450 Stancliff Rd, Ste 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID: 13414**

SUBCONTRACT TO:

ALS Environmental
10450 Stancliff RoadSuite 210
Houston, TX 77084

Phone: +1 281 530 5656

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:	HS20021115
TSR:	Danielle Winnings

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS20021115-02**	**LH18/24-SP650_022520_BIX**	**Water**	**25 Feb 2020 14:00**
	SUB_Perch-6850			05 Mar 2020

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. Mallan	Date/Time:	2/26/20 15:30
Received By:	Corey G	Date/Time:	2/26/20 15:30
Cooler ID(s):		Temperature(s):	

00969985

ALS Environmental

Cooler Receipt Form

Project Chemist CH

Client/Project ALS-HI

Thermometer ID SM04

Date/Time Received: 2/26/20 Initials: CH

Date/Time Logged in: 2/26/20 Initials CH

1. Method of delivery: ○ US Mail ○ Fed Ex ○ UPS ○ DHL ✓ ALS Courier ○ Client

2. Samples received in: ✓ Cooler ○ Box ○ Envelope ○ Other

3. Were custody seals on coolers? ○ Yes ✓ No

Were they intact? ○ Yes ○ No ✓ N/A

Were they signed and dated? ○ Yes ○ No ✓ N/A

If yes, how many and where?

4. Packing Material: ○ Inserts ✓ Baggies ○ Bubble Wrap ○ Gel Packs ✓ Wet Ice ○ Sleeves ○ Other

5. Foreign or Regulated Soil? ○ Yes ✓ No Location of Sampling:

Cooler Tracking Number	COC ID	Date Opened	Time Opened	Opened By	Temp. °C	Temp Blank?
-		2/26/20	15:30	CH	2.9 13.3	☒
						☐
						☐
						☐

6. Were custody papers properly filled out (ink, signed, dated, etc)? ✓ Yes ○ No

7. Did all bottles arrive in good condition (not broken, no signs of leakage)? ✓ Yes ○ No

8. Were all sample labels complete (i.e., sample ID, analysis, preservation, etc)? ✓ Yes ○ No

9. Were appropriate bottles/containers and volumes received for the requested tests? ✓ Yes ○ No

10. Did sample labels and tags agree with custody documents? ✓ Yes ○ No

Notes, Discrepancies, & Resolutions:

Service request Label:

E2000180 5
ALS Laboratory Group
HS20021116

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Houston, TX 77099
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SAMPLE ACCEPTANCE POLICY

This policy outlines the criteria samples must meet to be accepted by ALS Environmental – Houston HRMS.

Cooler Custody Seals (desirable, mandatory if specified in SAP):

- ✓ Intact on outside of cooler, signed and dated

Chain-of-Custody (COC) documentation (mandatory):

The following is required on each COC:

- ✓ Sample ID, the location, date and time of collection, collector's name, preservation type, sample type, and any other special remarks concerning the sampleThe COC must be completed in ink.
- ✓ Signature and date of relinquishing party.

In the absence of a COC at sample receipt, the COC will be requested from the client.

Sample Integrity (mandatory):

Samples are inspected upon arrival to ensure that sample integrity was not compromised during transfer to the laboratory.

- ✓ Sample containers must arrive in good condition (not broken or leaking).
- ✓ Samples must be labeled appropriately, including Sample IDs, and requested test using durable labels and indelible ink.
- ✓ The correct type of sample bottle must be used for the method requested.
- ✓ An appropriate sample volume, or weight, must be received.
- ✓ Sample IDs and number of containers must reconcile with the COC.
- ✓ Samples must be received within the method defined holding time.

Temperature Requirement (varies by sample matrix):

- ✓ Aqueous and Non-aqueous samples must be shipped and stored cold, at 0 to 6ºC.
- ✓ Tissue samples must be shipped and stored frozen, at -20 to -10ºC.
- ✓ Air samples are shipped and stored cold, at 0 to 6ºC
- ✓ The sample temperature must be recorded on the COC

All cooler inspections are documented on the Cooler Receipt Form (CRF). A separate CRF is completed for each service request. Any samples not meeting the above criteria are noted on the CRF and the Project Manager notified. The Project Manager must resolve any sample integrity issues with the client prior to proceeding with the analysis. Such resolutions are documented in writing and filed with the project folder. Data associated with samples received outside of this acceptance policy will be qualified on the case narrative of the final report

Preparation Information Benchsheets

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 210, Houston, TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

Preparation Information Benchsheet

Prep Run#: 355072 **Prep WorkFlow:** GenExt28Day **Status:** Prepped
Team: Semivoa GCMS/KBROWN **Prep Method:** Method **Prep Date/Time:** 3/10/20 10:33

#	Lab Code	Client ID	B#	Method /Test	pH	Cl	Matrix	Amt. Ext.	Sample Description
1	E2000179-001	LH18/24-SP140_022520	.01	6850/ClO4 DOD			Water	10mL	
2	E2000180-001	LH18/24-SP650_022520_BIX	.01	6850/ClO4 DOD			Water	10mL	
3	E2000181-001	LH18/24-SP650_022520_BIX	.01	6850/ClO4 DOD			Water	10mL	
4	E2000182-001	GW-MW-89D-20200226-01	.01	6850/ClO4			Ground Water	10mL	
5	E2000186-001	GW-MW-98D-20200227-01	.01	6850/ClO4			Ground Water	10mL	
6	E2000186-002	GW-MW-6602-20200227-01	.01	6850/ClO4			Ground Water	10mL	
7	E2000186-003	GW-MW-29D-20200227-01	.01	6850/ClO4			Ground Water	10mL	
8	E2000206-001	LH18/24-SP650_030420_BIX	.01	6850/ClO4 DOD			Water	10mL	
9	EQ2000089-01	MB		6850/ClO4 DOD			Liquid	10mL	
10	EQ2000089-02	LCS		6850/ClO4 DOD			Liquid	10mL	
11	EQ2000089-03	DLCS		6850/ClO4 DOD			Liquid	10mL	

Spiking Solutions

Name: Sodium Perchlorate 1 ug/mL (IS) (18-O) as CLO4 Inventory ID 202037 Logbook Ref: Sodium Perchlorate Expires On: 05/22/2021

E2000179-001	100.00µL	E2000180-001	100.00µL	E2000181-001	100.00µL	E2000182-001	100.00µL	E2000186-001	100.00µL	E2000186-002	100.00µL
E2000186-003	100.00µL	E2000206-001	100.00µL	EQ2000089-01	100.00µL	EQ2000089-01	100.00µL	EQ2000089-02	100.00µL	EQ2000089-02	100.00µL
EQ2000089-03	100.00µL	EQ2000089-03	100.00µL								

Name: Perchlorate Intermediate Stock1 Inventory ID 204799 Logbook Ref: 200657 1.0ug/mL KN Expires On: 05/15/2020

EQ2000089-02	10.00µL	EQ2000089-02	10.00µL	EQ2000089-03	10.00µL	EQ2000089-03	10.00µL

Preparation Steps

Step: Preparation
Started: 3/10/20 10:33
Finished: 3/10/20 12:00
By: KBROWN
Comments

Comments: _____

Reviewed By: KB Date: 3/10/2020

Analytical Results

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Phone (713)266-1599 Fax (713)266-0130
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ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2000180
Project:	HS20021115	**Date Collected:**	2/25/20 1400
Sample Matrix:	Water	**Date Received:**	2/26/20
Sample Name:	LH18/24-SP650_022520_BIX	**Units:**	µg/L
Lab Code:	E2000180-001	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.161**		0.100	0.0250	1	3/10/20	3/11/20 14:36	355072	673020	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2000180
Project:	HS20021115	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	µg/L
Lab Code:	EQ2000089-01	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0250	1	3/10/20	3/10/20 14:25	355072	673019	

Accuracy & Precision

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ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: HS20021115
Sample Matrix: Water

Service Request: E2000180
Date Analyzed: 3/10/20

Lab Control Sample Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Units: µg/L
Basis: NA

Extraction Lot: 355072

	Lab Control Sample EQ2000089-02			Duplicate Lab Control Sample EQ2000089-03					
Analyte Name	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Perchlorate	1.04	1.00	104	1.13	1.00	113	84 - 119	8	15

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

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

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2000180
Project:	HS20021115	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Lab Control Sample	**Units:**	µg/L
Lab Code:	EQ2000089-02	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**1.04**		0.100	0.0250	1	3/10/20	3/10/20 14:33	355072	673019	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2000180
Project:	HS20021115	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Duplicate Lab Control Sample	**Units:**	µg/L
Lab Code:	EQ2000089-03	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**1.13**		0.100	0.0250	1	3/10/20	3/10/20 14:41	355072	673019	

Initial Calibration

ALS Environmental - Houston HRMS
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Phone (713)266-1599 Fax (713)266-0130
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20191230

ICAL Date: 12/30/2019
Cal. Std. xp: 5/14/2020
ICAL ID: **EC2000001**

1st Review: Kneir
2nd Review: Hvan

ALS Environmental
LCMS01 -Shimadzu 8050

Mobile Phases **A:** 0.75% Formic Acid/Water 3100803-09 **B:** MeOH 3100802-01

	Sample Name		File Name	Acquisition Method	Dilution	R	Comments	Date/Time
	null	null	20191230_001	Perchlorate6850b.lcm	1x	☒		12/30/2019 10:02
	null	null	20191230_002	Perchlorate6850b.lcm	1x	☒		12/30/2019 10:07
	DIBLK	DIBLK	20191230_003	Perchlorate6850b.lcm	1x	☒		12/30/2019 10:12
	DIBLK	DIBLK	20191230_004	Perchlorate6850b.lcm	1x	☒		12/30/2019 10:20
	IB	IB	20191230_005	Perchlorate6850b.lcm	1x	☒		12/30/2019 10:28
	PERCHLORATE7	PERCHLORATE7	20191230_006	Perchlorate6850b.lcm	1x	☒	3100805-02	12/30/2019 10:48
	PERCHLORATE1	PERCHLORATE1	20191230_007	Perchlorate6850b.lcm	1x	☒	3100804-05	12/30/2019 10:56
	PERCHLORATE2	PERCHLORATE2	20191230_008	Perchlorate6850b.lcm	1x	☒	3100804-06	12/30/2019 11:04
	PERCHLORATE3	PERCHLORATE3	20191230_009	Perchlorate6850b.lcm	1x	☒	3100804-07	12/30/2019 11:12
	PERCHLORATE4	PERCHLORATE4	20191230_010	Perchlorate6850b.lcm	1x	☒	3100804-08	12/30/2019 11:19
	PERCHLORATE5	PERCHLORATE5	20191230_011	Perchlorate6850b.lcm	1x	☒	3100804-09	12/30/2019 11:27
	PERCHLORATE6	PERCHLORATE6	20191230_012	Perchlorate6850b.lcm	1x	☒	3100805-01	12/30/2019 11:35
	PERCHLORATE8	PERCHLORATE8	20191230_013	Perchlorate6850b.lcm	1x	☒	3100805-03	12/30/2019 11:43
	PERCHLORATE9	PERCHLORATE9	20191230_014	Perchlorate6850b.lcm	1x	☒	3100805-04	12/30/2019 11:51
	PERCHLORATE10	PERCHLORATE10	20191230_015	Perchlorate6850b.lcm	1x	☒	3100805-05	12/30/2019 11:59
	ICV	ICV	20191230_016	Perchlorate6850b.lcm	1x	☒	3100805-06	12/30/2019 12:07
	EQ1900442-01	EQ1900442-01	20191230_017	Perchlorate6850b.lcm	1x	☒		12/30/2019 14:01
	EQ1900442-02	EQ1900442-02	20191230_018	Perchlorate6850b.lcm	1x	☒		12/30/2019 14:09
	EQ1900442-03	EQ1900442-03	20191230_019	Perchlorate6850b.lcm	1x	☒		12/30/2019 14:17
	EQ1900442-04	EQ1900442-04	20191230_020	Perchlorate6850b.lcm	1x	☒		12/30/2019 14:25
	EQ1900442-05	EQ1900442-05	20191230_021	Perchlorate6850b.lcm	1x	☒		12/30/2019 14:33
	E1900912-001	E1900912-001	20191230_022	Perchlorate6850b.lcm	1x	☒		12/30/2019 14:41
	E1900912-002	E1900912-002	20191230_023	Perchlorate6850b.lcm	1x	☒		12/30/2019 14:49
	CCV	CCV	20191230_024	Perchlorate6850b.lcm	1x	☒	3100805-02	12/30/2019 14:57
	E1900912-001X1000	E1900912-001X1000	20191230_025	Perchlorate6850b.lcm	1000	☒		12/30/2019 17:06
	E1900912-002X100	E1900912-002X100	20191230_026	Perchlorate6850b.lcm	100	☒		12/30/2019 17:14
	CCV	CCV	20191230_027	Perchlorate6850b.lcm	1x	☒	3100805-02	12/30/2019 17:22

Initial Calibration - Detailed Report

Calibration ID: EC2000001 **Instrument ID:** E-LCMS-01
Column Name: 1

#	Lab Code	Sample Name	File Location	Aquisition Date
07	EC2000001-07	PERCHLORATE7	20191230_006	12/30/2019 10:48
01	EC2000001-01	PERCHLORATE1	20191230_007	12/30/2019 10:56
02	EC2000001-02	PERCHLORATE2	20191230_008	12/30/2019 11:04
03	EC2000001-03	PERCHLORATE3	20191230_009	12/30/2019 11:12
04	EC2000001-04	PERCHLORATE4	20191230_010	12/30/2019 11:19
05	EC2000001-05	PERCHLORATE5	20191230_011	12/30/2019 11:27
06	EC2000001-06	PERCHLORATE6	20191230_012	12/30/2019 11:35
08	EC2000001-08	PERCHLORATE8	20191230_013	12/30/2019 11:43
09	EC2000001-09	PERCHLORATE9	20191230_014	12/30/2019 11:51
10	EC2000001-10	PERCHLORATE10	20191230_015	12/30/2019 11:59

Analyte **Curve Fit** **Weighting**

Perchlorate **Average RF** **RSD = 10.79** **Average RF = 0.1352**

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.1000	0.1736	02	0.5000	0.1222	03	0.7000	0.1219	04	1.0000	0.1363
05	2.0000	0.1337	06	5.0000	0.1268	07	10.0000	0.1373	08	20.0000	0.1349
09	30.0000	0.133	10	50.0000	0.1325						

Analyte

Perchlorate

#	Amount	Calculated Conc	%D	#	Amount	Calculated Conc	%D	#	Amount	Calculated Conc	%D
01	0.1000	0.128	28.4	02	0.5000	0.452	-9.6	03	0.7000	0.631	-9.9
04	1.0000	1.01	0.8	05	2.0000	1.98	-1.1	06	5.0000	4.69	-6.2
07	10.0000	10.2	1.6	08	20.0000	20.0	-0.2	09	30.0000	29.5	-1.6
10	50.0000	49.0	-2.0								

Initial Calibration Verification Summary Report

Calibration ID:	EC2000001	**Instrument ID:**	E-LCMS-01
Datafile ID:	20191230_016	**Column Name:**	1

Analyte	Lab Code	Type	Curve Fit	True Value	Calc Conc	Units	Result	Criteria
Perchlorate	EC2000001-11	T	Average RF	10	12.276	ng/mL	22.7	<= 25

ALS Group Houston

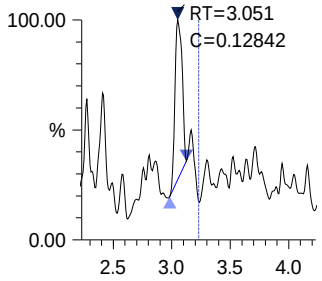
PERCHLORATE1

Date acquired: 12/30/2019 10:56:14 AM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20191230\20191230_007.lcd
Vial: 3 | Inj. Volume: 25.0000uL | Tray: 1

Name	Data Filename	Sample ID	Found RT	Area	Conc.	Acquired Date	Cal Point	Dil. Factor	Inj Vol	ISTD Area	Tray	Vial
Perchlorate	20191230_007	PERCHLORATE1	3.051	4022	0.12842	12/30/2019 10:56:14 AM	Yes	1.00000	25.0000	231680	1	3
Sodium Perchlorate-18O4_IS	20191230_007	PERCHLORATE1	3.051	231680	1.00000	12/30/2019 10:56:14 AM	No	1.00000	25.0000	231680	1	3

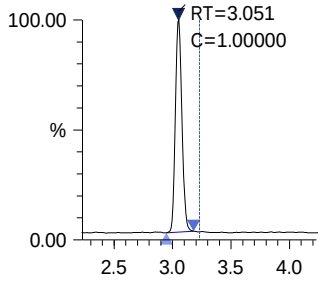
Perchlorate

Conc 0.12842
Area 4022
Q 99.00>83.00 (-) 1.27e3



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 231680
ISTD 107.00>89.00 (-) 5.94e4



ALS Group Houston

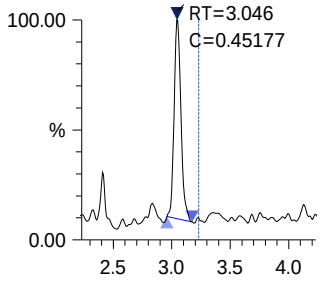
PERCHLORATE2

Date acquired: 12/30/2019 11:04:09 AM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20191230\20191230_008.lcd
Vial: 4 | Inj. Volume: 25.0000uL | Tray: 1

Name	Data Filename	Sample ID	Found RT	Area	Conc.	Acquired Date	Cal Point	Dil. Factor	Inj Vol	ISTD Area	Tray	Vial
Perchlorate	20191230_008	PERCHLORATE2	3.046	15985	0.45177	12/30/2019 11:04:09 AM	Yes	1.00000	25.0000	261704	1	4
Sodium Perchlorate-18O4_IS	20191230_008	PERCHLORATE2	3.045	261704	1.00000	12/30/2019 11:04:09 AM	No	1.00000	25.0000	261704	1	4

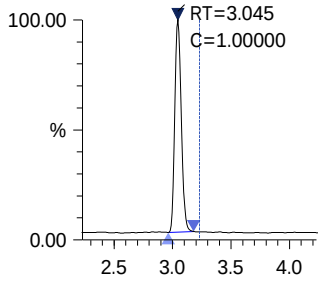
Perchlorate

Conc 0.45177
Area 15985
Q 99.00>83.00 (-) 4.21e3



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 261704
ISTD 107.00>89.00 (-) 6.75e4



ALS Group Houston

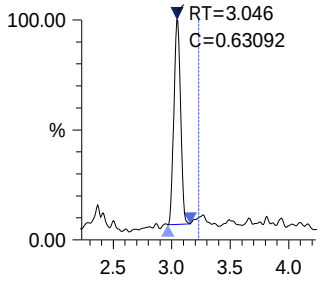
PERCHLORATE3

Date acquired: 12/30/2019 11:12:06 AM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20191230\20191230_009.lcd
Vial: 5 | Inj. Volume: 25.0000uL | Tray: 1

Name	Data Filename	Sample ID	Found RT	Area	Conc.	Acquired Date	Cal Point	Dil. Factor	Inj Vol	ISTD Area	Tray	Vial
Perchlorate	20191230_009	PERCHLORATE3	3.046	22031	0.63092	12/30/2019 11:12:06 AM	Yes	1.00000	25.0000	258274	1	5
Sodium Perchlorate-18O4_IS	20191230_009	PERCHLORATE3	3.044	258274	1.00000	12/30/2019 11:12:06 AM	No	1.00000	25.0000	258274	1	5

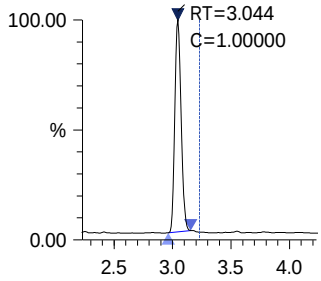
Perchlorate

Conc 0.63092
Area 22031
Q 99.00>83.00 (-) 5.75e3



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 258274
ISTD 107.00>89.00 (-) 6.88e4



ALS Group Houston

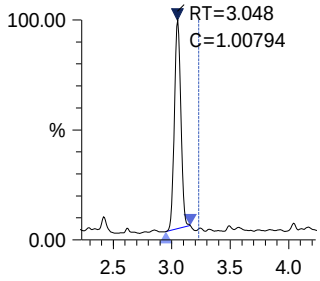
PERCHLORATE4

Date acquired: 12/30/2019 11:19:58 AM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20191230\20191230_010.lcd
Vial: 6 | Inj. Volume: 25.0000uL | Tray: 1

Name	Data Filename	Sample ID	Found RT	Area	Conc.	Acquired Date	Cal Point	Dil. Factor	Inj Vol	ISTD Area	Tray	Vial
Perchlorate	20191230_010	PERCHLORATE4	3.048	36488	1.00794	12/30/2019 11:19:58 AM	Yes	1.00000	25.0000	267754	1	6
Sodium Perchlorate-18O4_IS	20191230_010	PERCHLORATE4	3.046	267754	1.00000	12/30/2019 11:19:58 AM	No	1.00000	25.0000	267754	1	6

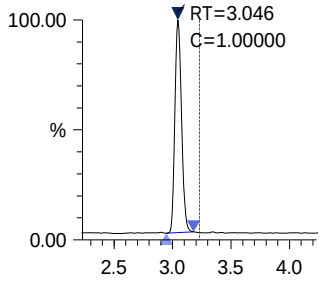
Perchlorate

Conc 1.00794
Area 36488
Q 99.00>83.00 (-) 9.73e3



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 267754
ISTD 107.00>89.00 (-) 6.78e4



ALS Group Houston

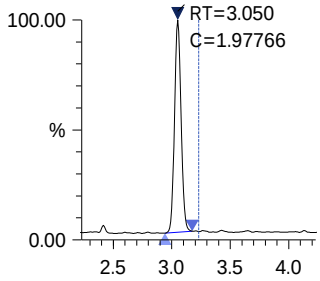
PERCHLORATE5

Date acquired: 12/30/2019 11:27:53 AM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20191230\20191230_011.lcd
Vial: 7 | Inj. Volume: 25.0000uL | Tray: 1

Name	Data Filename	Sample ID	Found RT	Area	Conc.	Acquired Date	Cal Point	Dil. Factor	Inj Vol	ISTD Area	Tray	Vial
Perchlorate	20191230_011	PERCHLORATE5	3.050	74631	1.97766	12/30/2019 11:27:53 AM	Yes	1.00000	25.0000	279118	1	7
Sodium Perchlorate-18O4_IS	20191230_011	PERCHLORATE5	3.046	279118	1.00000	12/30/2019 11:27:53 AM	No	1.00000	25.0000	279118	1	7

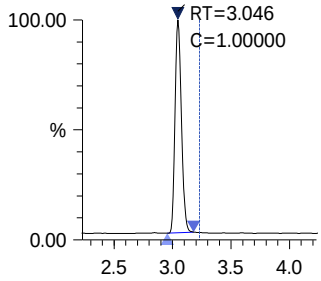
Perchlorate

Conc 1.97766
Area 74631
Q 99.00>83.00 (-) 1.92e4



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 279118
ISTD 107.00>89.00 (-) 7.33e4



ALS Group Houston

PERCHLORATE6

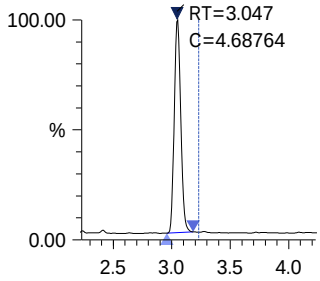
Date acquired: 12/30/2019 11:35:50 AM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20191230\20191230_012.lcd
Vial: 8 | Inj. Volume: 25.0000uL | Tray: 1

Name	Data Filename	Sample ID	Found RT	Area	Conc.	Acquired Date	Cal Point	Dil. Factor	Inj Vol	ISTD Area	Tray	Vial
Perchlorate	20191230_012	PERCHLORATE6	3.047	159122	4.68764	12/30/2019 11:35:50 AM	Yes	1.00000	25.0000	251072	1	8
Sodium Perchlorate-18O4_IS	20191230_012	PERCHLORATE6	3.045	251072	1.00000	12/30/2019 11:35:50 AM	No	1.00000	25.0000	251072	1	8

Perchlorate

Conc 4.68764
Area 159122

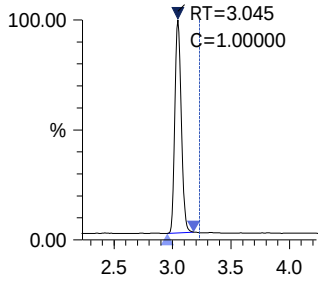
Q 99.00>83.00 (-) 4.12e4



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 251072

ISTD 107.00>89.00 (-) 6.53e4



ALS Group Houston

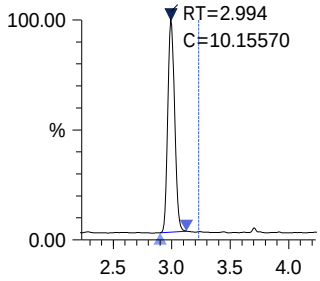
PERCHLORATE7

Date acquired: 12/30/2019 10:48:20 AM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20191230\20191230_006.lcd
Vial: 9 | Inj. Volume: 25.0000uL | Tray: 1

Name	Data Filename	Sample ID	Found RT	Area	Conc.	Acquired Date	Cal Point	Dil. Factor	Inj Vol	ISTD Area	Tray	Vial
Perchlorate	20191230_006	PERCHLORATE7	2.994	298821	10.15570	12/30/2019 10:48:20 AM	Yes	1.00000	25.0000	217632	1	9
Sodium Perchlorate-18O4_IS	20191230_006	PERCHLORATE7	2.991	217632	1.00000	12/30/2019 10:48:20 AM	No	1.00000	25.0000	217632	1	9

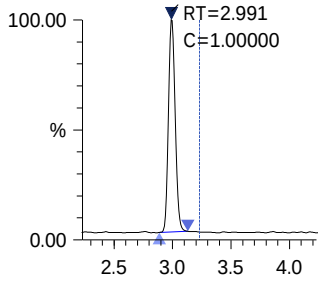
Perchlorate

Conc 10.15570
Area 298821
Q 99.00>83.00 (-) 7.46e4



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 217632
ISTD 107.00>89.00 (-) 5.38e4



ALS Group Houston

PERCHLORATE8

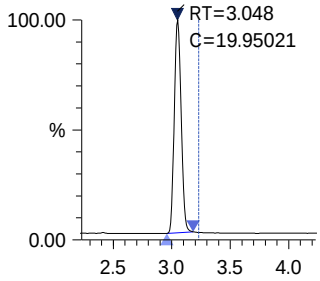
Date acquired: 12/30/2019 11:43:47 AM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20191230\20191230_013.lcd
Vial: 10 | Inj. Volume: 25.0000uL | Tray: 1

Name	Data Filename	Sample ID	Found RT	Area	Conc.	Acquired Date	Cal Point	Dil. Factor	Inj Vol	ISTD Area	Tray	Vial
Perchlorate	20191230_013	PERCHLORATE8	3.048	557358	19.95021	12/30/2019 11:43:47 AM	Yes	1.00000	25.0000	206636	1	10
Sodium Perchlorate-18O4_IS	20191230_013	PERCHLORATE8	3.045	206636	1.00000	12/30/2019 11:43:47 AM	No	1.00000	25.0000	206636	1	10

Perchlorate

Conc 19.95021
Area 557358

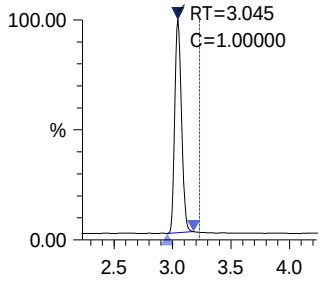
Q 99.00>83.00 (-) 1.37e5



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 206636

ISTD 107.00>89.00 (-) 5.11e4



ALS Group Houston

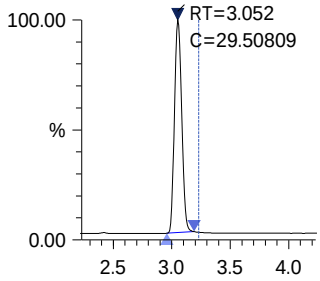
PERCHLORATE9

Date acquired: 12/30/2019 11:51:43 AM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20191230\20191230_014.lcd
Vial: 11 | Inj. Volume: 25.0000uL | Tray: 1

Name	Data Filename	Sample ID	Found RT	Area	Conc.	Acquired Date	Cal Point	Dil. Factor	Inj Vol	ISTD Area	Tray	Vial
Perchlorate	20191230_014	PERCHLORATE9	3.052	730647	29.50809	12/30/2019 11:51:43 AM	Yes	1.00000	25.0000	183142	1	11
Sodium Perchlorate-18O4_IS	20191230_014	PERCHLORATE9	3.049	183142	1.00000	12/30/2019 11:51:43 AM	No	1.00000	25.0000	183142	1	11

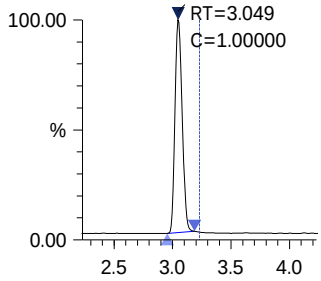
Perchlorate

Conc 29.50809
Area 730647
Q 99.00>83.00 (-) 1.70e5



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 183142
ISTD 107.00>89.00 (-) 4.27e4



ALS Group Houston

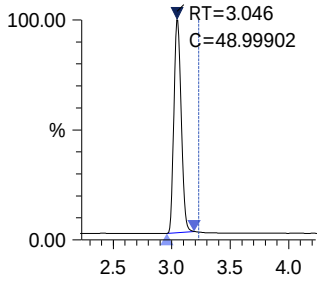
PERCHLORATE10

Date acquired: 12/30/2019 11:59:38 AM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20191230\20191230_015.lcd
Vial: 12 | Inj. Volume: 25.0000uL | Tray: 1

Name	Data Filename	Sample ID	Found RT	Area	Conc.	Acquired Date	Cal Point	Dil. Factor	Inj Vol	ISTD Area	Tray	Vial
Perchlorate	20191230_015	PERCHLORATE10	3.046	1090166	48.99902	12/30/2019 11:59:38 AM	Yes	1.00000	25.0000	164560	1	12
Sodium Perchlorate-18O4_IS	20191230_015	PERCHLORATE10	3.043	164560	1.00000	12/30/2019 11:59:38 AM	No	1.00000	25.0000	164560	1	12

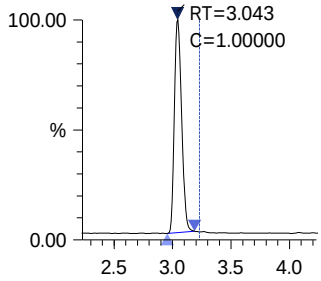
Perchlorate

Conc 48.99902
Area 1090166
Q 99.00>83.00 (-) 2.51e5



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 164560
ISTD 107.00>89.00 (-) 3.80e4



ALS Group Houston

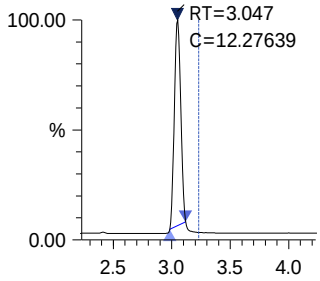
ICV

Date acquired: 12/30/2019 12:07:32 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20191230\20191230_016.lcd
Vial: 13 | Inj. Volume: 25.0000uL | Tray: 1

Name	Data Filename	Sample ID	Found RT	Area	Conc.	Acquired Date	Cal Point	Dil. Factor	Inj Vol	ISTD Area	Tray	Vial
Perchlorate	20191230_016	ICV	3.047	347932	12.27639	12/30/2019 12:07:32 PM	No	1.00000	25.0000	209626	1	13
Sodium Perchlorate-18O4_IS	20191230_016	ICV	3.045	209626	1.00000	12/30/2019 12:07:32 PM	No	1.00000	25.0000	209626	1	13

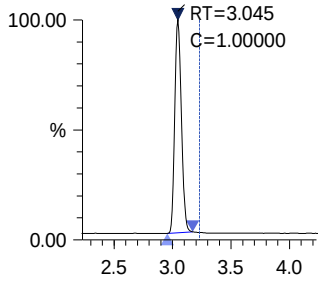
Perchlorate

Conc 12.27639
Area 347932
Q 99.00>83.00 (-) 9.49e4



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 209626
ISTD 107.00>89.00 (-) 5.28e4



Chromatograms and Selected Ion Monitoring

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 320, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

20200310

ICAL Date: 12/30/2019
Cal. Std. xp: 5/14/2020
ICAL ID: **EC2000001**

1st Review: Kneir
2nd Review: Hvan

ALS Environmental
LCMS01 -Shimadzu 8050

Mobile Phases **A:** 0.75% Formic Acid/Water 3100803-09 **B:** MeOH 3100802-01

	Sample Name		File Name	Acquisition Method	Dilution	R	Comments	Date/Time
	null		20200310_001	Perchlorate6850b.lcm	1x	☒		3/10/2020 13:26
	null		20200310_002	Perchlorate6850b.lcm	1x	☒		3/10/2020 13:31
	DI		20200310_003	Perchlorate6850b.lcm	1x	☒		3/10/2020 13:36
	IB		20200310_004	Perchlorate6850b.lcm	1x	☒		3/10/2020 13:44
	PERCHLORATE7		20200310_005	Perchlorate6850b.lcm	1x	☒	3100805-02	3/10/2020 13:52
	LODV		20200310_006	Perchlorate6850b.lcm	1x	☒		3/10/2020 14:17
	EQ2000089-01		20200310_007	Perchlorate6850b.lcm	1x	☒		3/10/2020 14:25
	EQ2000089-02		20200310_008	Perchlorate6850b.lcm	1x	☒		3/10/2020 14:33
	EQ2000089-03		20200310_009	Perchlorate6850b.lcm	1x	☒		3/10/2020 14:41
	E2000179-001		20200310_010	Perchlorate6850b.lcm	1x	☒	needs DL	3/10/2020 14:49
	E2000180-001		20200310_011	Perchlorate6850b.lcm	1x	☒	needs RR-poss carryover	3/10/2020 14:57
	E2000181-001		20200310_012	Perchlorate6850b.lcm	1x	☒	needs RR-poss carryover	3/10/2020 15:05
	E2000182-001		20200310_013	Perchlorate6850b.lcm	1x	☒	needs DL	3/10/2020 15:13
	E2000186-001		20200310_014	Perchlorate6850b.lcm	1x	☒	needs DL	3/10/2020 15:20
	E2000186-002		20200310_015	Perchlorate6850b.lcm	1x	☒	needs RR-poss carryover	3/10/2020 15:28
	E2000186-003		20200310_016	Perchlorate6850b.lcm	1x	☒	needs DL	3/10/2020 15:36
	PERCHLORATE7		20200310_017	Perchlorate6850b.lcm	1x	☒	3100805-02	3/10/2020 15:44
	E2000206-001		20200310_018	Perchlorate6850b.lcm	1x	☒		3/10/2020 15:52
	E2000180-001		20200310_019	Perchlorate6850b.lcm	1x	☒		3/10/2020 16:00
	E2000186-002		20200310_020	Perchlorate6850b.lcm	1x	☒		3/10/2020 16:08
	PERCHLORATE7		20200310_021	Perchlorate6850b.lcm	1x	☒	3100805-02	3/10/2020 16:16
	IB		20200310_022	Perchlorate6850b.lcm	1x	☒		3/10/2020 16:24

20200311

1st Review: Kneir
2nd Review: Hvan

ALS Environmental
LCMS01 -Shimadzu 8050

ICAL Date: 12/30/2019
Cal. Std. xp: 5/14/2020
ICAL ID: **EC2000001**

Mobile Phases **A:** 0.75% Formic Acid/Water 3100803-09 **B:** MeOH 3100802-01

	Sample Name		File Name	Acquisition Method	Dilution	R	Comments	Date/Time
	null		20200311_001	Perchlorate6850b.lcm	1x	☒		3/11/2020 11:12
	null		20200311_002	Perchlorate6850b.lcm	1x	☒		3/11/2020 11:17
	DI		20200311_003	Perchlorate6850b.lcm	1x	☒		3/11/2020 11:23
	IB		20200311_004	Perchlorate6850b.lcm	1x	☒		3/11/2020 11:30
	PERCHLORATE7		20200311_005	Perchlorate6850b.lcm	1x	☒	3100805-02	3/11/2020 11:38
	LODV		20200311_006	Perchlorate6850b.lcm	1x	☒		3/11/2020 11:46
	E2000206-001		20200311_007	Perchlorate6850b.lcm	1x	☒		3/11/2020 11:54
	E2000180-001		20200311_008	Perchlorate6850b.lcm	1x	☒		3/11/2020 12:02
	E2000186-002		20200311_009	Perchlorate6850b.lcm	1x	☒		3/11/2020 12:10
	E2000181-001		20200311_010	Perchlorate6850b.lcm	1x	☒		3/11/2020 12:18
	E2000179-001X1000		20200311_011	Perchlorate6850b.lcm	1000	☒		3/11/2020 12:37
	E2000182-001X250		20200311_012	Perchlorate6850b.lcm	250	☒		3/11/2020 12:45
	E2000186-001X1000		20200311_013	Perchlorate6850b.lcm	1000	☒		3/11/2020 12:53
	E2000186-003X1000		20200311_014	Perchlorate6850b.lcm	1000	☒		3/11/2020 13:01
	PERCHLORATE7		20200311_015	Perchlorate6850b.lcm	1x	☒	3100805-02	3/11/2020 13:28

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2000180
Project:	HS20021115	**Date Analyzed:**	3/10/20 13:52

Internal Standard Area and RT Summary

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

File ID:	I:\LCMS01\DATA\20200310\20200310_005	**Lab Code:**	EQ2000093-01
Instrument ID:	E-LCMS-01	**Analysis Lot:**	673019
Analytical Method:	6850	**Signal ID:**	1

		Sodium Perchlorate-18O4	
		Area	**RT**
	ICAL Average ==>	232,157	3.04
	Upper Limit ==>	348,236	5.04
	Lower Limit ==>	116,079	1.04
Associated Analyses			
Continuing Calibration Verification	EQ2000093-01	258,077	3.07
Method Blank	EQ2000089-01	266,181	3.07
Lab Control Sample	EQ2000089-02	259,616	3.07
Duplicate Lab Control Sample	EQ2000089-03	279,998	3.07

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

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2000180
Project:	HS20021115	**Date Analyzed:**	3/10/20 15:44

Internal Standard Area and RT Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

File ID:	I:\LCMS01\DATA\20200310\20200310_017	**Lab Code:**	EQ2000093-02
Instrument ID:	E-LCMS-01	**Analysis Lot:**	673019
Analytical Method:	6850	**Signal ID:**	1

		Sodium Perchlorate-18O4	
		Area	**RT**
	ICAL Average ==>	232,157	3.04
	Upper Limit ==>	348,236	5.04
	Lower Limit ==>	116,079	1.04
Associated Analyses			
Continuing Calibration Verification	EQ2000093-02	289,206	3.07

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

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2000180
Project:	HS20021115	**Date Analyzed:**	3/11/20 11:38

Internal Standard Area and RT Summary

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

File ID:	I:\LCMS01\DATA\20200311\20200311_005	**Lab Code:**	EQ2000094-01
Instrument ID:	E-LCMS-01	**Analysis Lot:**	673020
Analytical Method:	6850	**Signal ID:**	1

		Sodium Perchlorate-18O4	
		Area	**RT**
	ICAL Average ==>	232,157	3.04
	Upper Limit ==>	348,236	5.04
	Lower Limit ==>	116,079	1.04
Associated Analyses			
Continuing Calibration Verification	EQ2000094-01	280,844	3.07

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

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2000180
Project:	HS20021115	**Date Analyzed:**	3/11/20 13:28

Internal Standard Area and RT Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

File ID:	I:\LCMS01\DATA\20200311\20200311_015	**Lab Code:**	EQ2000094-02
Instrument ID:	E-LCMS-01	**Analysis Lot:**	673020
Analytical Method:	6850	**Signal ID:**	1

		Sodium Perchlorate-18O4	
		Area	**RT**
	ICAL Average ==>	232,157	3.04
	Upper Limit ==>	348,236	5.04
	Lower Limit ==>	116,079	1.04
Associated Analyses			
Continuing Calibration Verification	EQ2000094-02	305,228	3.01
LH18/24-SP650_022520_BIX	E2000180-001	336,184	3.01

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

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2000180
Project:	HS20021115	**Date Analyzed:**	3/11/20 15:00

Internal Standard Area and RT Summary

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

File ID:	I:\LCMS01\DATA\20200311\20200311_019	**Lab Code:**	EQ2000094-03
Instrument ID:	E-LCMS-01	**Analysis Lot:**	673020
Analytical Method:	6850	**Signal ID:**	1

		Sodium Perchlorate-18O4	
		Area	**RT**
	ICAL Average ==>	232,157	3.04
	Upper Limit ==>	348,236	5.04
	Lower Limit ==>	116,079	1.04
Associated Analyses			
Continuing Calibration Verification	EQ2000094-03	235,110	3.06

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

ALS Group Houston

PERCHLORATE7

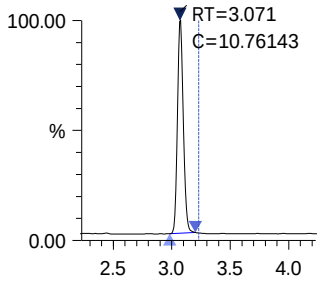
Date acquired: 3/10/2020 1:52:29 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200310\20200310_005.lcd
Vial: 3 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE7	3/10/2020 1:52:29 PM	375491	10.76143	20200310_005	3.071	25.0000	1.0000	3
Sodium Perchlorate-18O4_IS	PERCHLORATE7	3/10/2020 1:52:29 PM	258077	1.00000	20200310_005	3.071	25.0000	1.0000	3

Perchlorate

Conc 10.76143
Area 375491

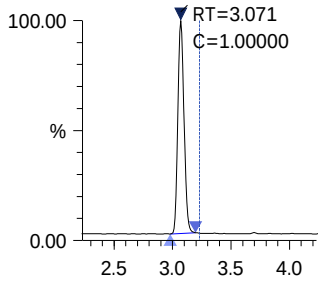
Q 99.00>83.00 (-) 1.07e5



Sodium Perchlorate-18O4 _IS

Conc 1.00000
Area 258077

ISTD 107.00>89.00 (-) 7.13e4



ALS Group Houston

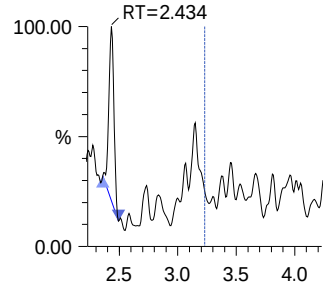
EQ2000089-01

Date acquired: 3/10/2020 2:25:38 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200310\20200310_007.lcd
Vial: 5 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	EQ2000089-01	3/10/2020 2:25:38 PM	----	----	20200310_007	----	25.0000	1.0000	5
Sodium Perchlorate-18O4_IS	EQ2000089-01	3/10/2020 2:25:38 PM	266181	1.00000	20200310_007	3.074	25.0000	1.0000	5

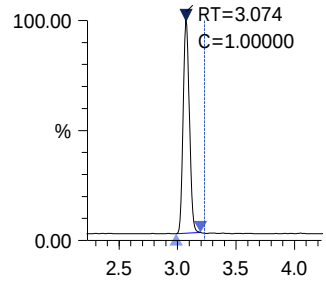
Perchlorate

Conc ----
Area ----
Q 99.00>83.00 (-) 7.48e2



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 266181
ISTD 107.00>89.00 (-) 7.25e4



ALS Group Houston

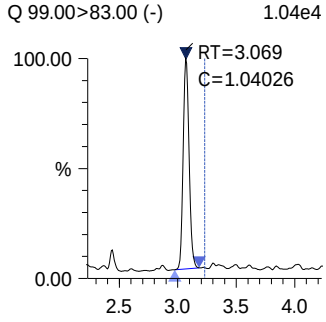
EQ2000089-02

Date acquired: 3/10/2020 2:33:31 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200310\20200310_008.lcd
Vial: 6 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	EQ2000089-02	3/10/2020 2:33:31 PM	36514	1.04026	20200310_008	3.069	25.0000	1.0000	6
Sodium Perchlorate-18O4_IS	EQ2000089-02	3/10/2020 2:33:31 PM	259616	1.00000	20200310_008	3.067	25.0000	1.0000	6

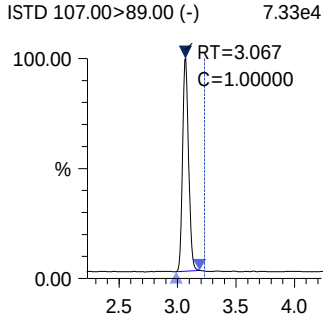
Perchlorate

Conc 1.04026
Area 36514



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 259616



ALS Group Houston

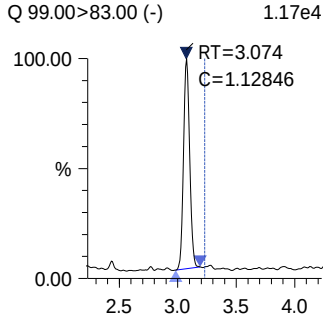
EQ2000089-03

Date acquired: 3/10/2020 2:41:26 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200310\20200310_009.lcd
Vial: 7 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	EQ2000089-03	3/10/2020 2:41:26 PM	42719	1.12846	20200310_009	3.074	25.0000	1.0000	7
Sodium Perchlorate-18O4_IS	EQ2000089-03	3/10/2020 2:41:26 PM	279998	1.00000	20200310_009	3.071	25.0000	1.0000	7

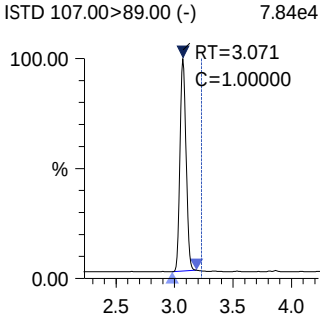
Perchlorate

Conc 1.12846
Area 42719



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 279998



ALS Group Houston

PERCHLORATE7

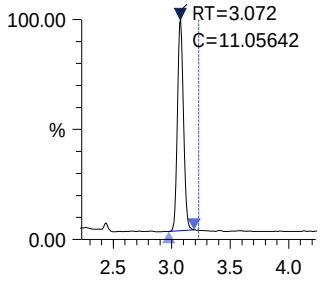
Date acquired: 3/10/2020 3:44:38 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200310\20200310_017.lcd
Vial: 3 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE7	3/10/2020 3:44:38 PM	432316	11.05642	20200310_017	3.072	25.0000	1.0000	3
Sodium Perchlorate-18O4_IS	PERCHLORATE7	3/10/2020 3:44:38 PM	289206	1.00000	20200310_017	3.071	25.0000	1.0000	3

Perchlorate

Conc 11.05642
Area 432316

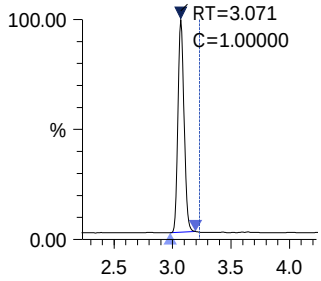
Q 99.00>83.00 (-) 1.20e5



Sodium Perchlorate-18O4 _IS

Conc 1.00000
Area 289206

ISTD 107.00>89.00 (-) 8.06e4



ALS Group Houston

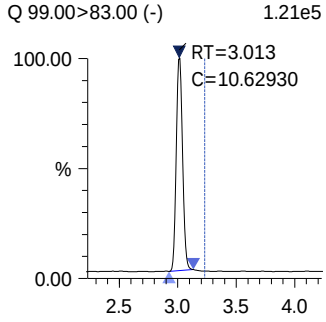
PERCHLORATE7

Date acquired: 3/11/2020 1:28:17 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200311\20200311_015.lcd
Vial: 3 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE7	3/11/2020 1:28:17 PM	438640	10.62930	20200311_015	3.013	25.0000	1.0000	3
Sodium Perchlorate-18O4_IS	PERCHLORATE7	3/11/2020 1:28:17 PM	305228	1.00000	20200311_015	3.011	25.0000	1.0000	3

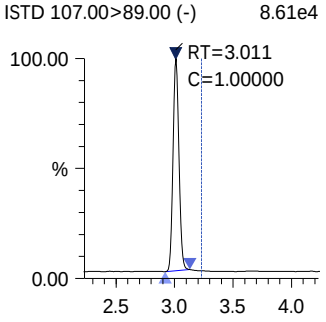
Perchlorate

Conc 10.62930
Area 438640



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 305228



ALS Group Houston

E2000180-001

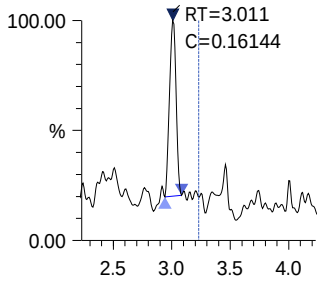
Date acquired: 3/11/2020 2:36:56 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200311\20200311_016.lcd
Vial: 9 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	E2000180-001	3/11/2020 2:36:56 PM	7338	0.16144	20200311_016	3.011	25.0000	1.0000	9
Sodium Perchlorate-18O4_IS	E2000180-001	3/11/2020 2:36:56 PM	336184	1.00000	20200311_016	3.007	25.0000	1.0000	9

Perchlorate

Conc 0.16144
Area 7338

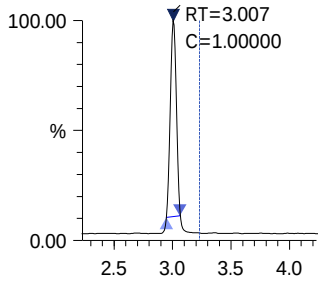
Q 99.00>83.00 (-) 2.33e3



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 336184

ISTD 107.00>89.00 (-) 1.01e5



ALS Group Houston

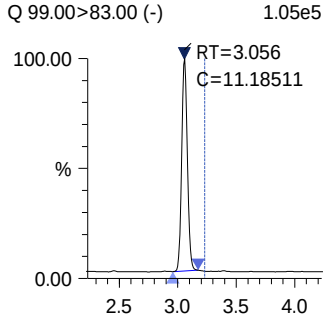
PERCHLORATE7

Date acquired: 3/11/2020 3:00:40 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200311\20200311_019.lcd
Vial: 3 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE7	3/11/2020 3:00:40 PM	355542	11.18511	20200311_019	3.056	25.0000	1.0000	3
Sodium Perchlorate-18O4_IS	PERCHLORATE7	3/11/2020 3:00:40 PM	235110	1.00000	20200311_019	3.055	25.0000	1.0000	3

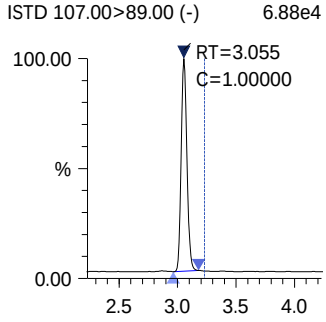
Perchlorate

Conc 11.18511
Area 355542



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 235110



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www.alsglobal.com

March 05, 2020

Analytical Report for Service Request No: K2001717

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

RE: HS20021115

Dear RJ,

Enclosed are the results of the sample(s) submitted to our laboratory February 28, 2020
For your reference, these analyses have been assigned our service request number **K2001717.**

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

RIGHT SOLUTIONS | RIGHT PARTNER

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Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LOD	Limit of Detection
LOQ	Limit of Quantitation
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

Inorganic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
E	The result is an estimate amount because the value exceeded the instrument calibration range.
J	The result is an estimated value.
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
i	The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
X	See case narrative.
Q	See case narrative. One or more quality control criteria was outside the limits.
H	The holding time for this test is immediately following sample collection. The samples were analyzed as soon as possible after receipt by the laboratory.

Metals Data Qualifiers

#	The control limit criteria is not applicable. See case narrative.
J	The result is an estimated value.
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
M	The duplicate injection precision was not met.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.
S	The reported value was determined by the Method of Standard Additions (MSA).
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
i	The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
X	See case narrative.
+	The correlation coefficient for the MSA is less than 0.995.
Q	See case narrative. One or more quality control criteria was outside the limits.

Organic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
A	A tentatively identified compound, a suspected aldol-condensation product.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
C	The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
D	The reported result is from a dilution.
E	The result is an estimated value.
J	The result is an estimated value.
N	The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
P	The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results.
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
i	The MRL/MDL or LOQ/LOD is elevated due to a chromatographic interference.
X	See case narrative.
Q	See case narrative. One or more quality control criteria was outside the limits.

Additional Petroleum Hydrocarbon Specific Qualifiers

F	The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
L	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
H	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
O	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
Y	The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
Z	The chromatographic fingerprint does not resemble a petroleum product.

ALS Group USA Corp. dba ALS Environmental (ALS) - Kelso
State Certifications, Accreditations, and Licenses

Agency	Web Site	Number
Alaska DEH	http://dec.alaska.gov/eh/lab/cs/csapproval.htm	UST-040
Arizona DHS	http://www.azdhs.gov/lab/license/env.htm	AZ0339
Arkansas - DEQ	http://www.adeq.state.ar.us/techsvs/labcert.htm	88-0637
California DHS (ELAP)	http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx	2795
DOD ELAP	http://www.denix.osd.mil/edqw/Accreditation/AccreditedLabs.cfm	L16-58-R4
Florida DOH	http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm	E87412
Hawaii DOH	http://health.hawaii.gov/	-
ISO 17025	http://www.pjlabs.com/	L16-57
Louisiana DEQ	http://www.deq.louisiana.gov/page/la-lab-accreditation	03016
Maine DHS	http://www.maine.gov/dhhs/	WA01276
Minnesota DOH	http://www.health.state.mn.us/accreditation	053-999-457
Nevada DEP	http://ndep.nv.gov/bsdw/labservice.htm	WA01276
New Jersey DEP	http://www.nj.gov/dep/enforcement/oqa.html	WA005
New York - DOH	https://www.wadsworth.org/regulatory/elap	12060
North Carolina DEQ	https://deq.nc.gov/about/divisions/water-resources/water-resources-data/water-sciences-home-page/laboratory-certification-branch/non-field-lab-certification	605
Oklahoma DEQ	http://www.deq.state.ok.us/CSDnew/labcert.htm	9801
Oregon – DEQ (NELAP)	http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	WA100010
South Carolina DHEC	http://www.scdhec.gov/environment/EnvironmentalLabCertification/	61002
Texas CEQ	http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html	T104704427
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C544
Wyoming (EPA Region 8)	https://www.epa.gov/region8-waterops/epa-region-8-certified-drinking-water-	-
Kelso Laboratory Website	www.alsglobal.com	NA

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. A complete listing of specific NELAP-certified analytes, can be found in the certification section at www.ALSGlobal.com or at the accreditation bodies web site.
Please refer to the certification and/or accreditation body's web site if samples are submitted for compliance purposes. The states highlighted above, require the analysis be listed on the state certification if used for compliance purposes and if the method/anlayte is offered by that state.

Case Narrative

ALS Environmental—Kelso Laboratory
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Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

1317 South 13th Ave, Kelso, WA 98626 | 1-360-577-7222 | www.alsglobal.com

Client: ALS Environmental - US
Project: HS20021115
Sample Matrix: Water

Service Request: K2001717
Date Received: 02/28/2020

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:

One water sample was received for analysis at ALS Environmental on 02/28/2020. Any discrepancies upon initial sample inspection are annotated on the sample receipt and preservation form included within this report. The sample was stored at minimum in accordance with the analytical method requirements.

General Chemistry:

No significant anomalies were noted with this analysis.

Approved by Noe D. Diaz Date 03/05/2020

Chain of Custody

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Phone (360)577-7222 Fax (360)636-1068
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K2001717

10450 Stancliff Rd, Ste 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID:** **13413**

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
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INVOICE INFORMATION:

Company:	ALS Houston
Contact:	Accounts Payable
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Reference:	HS20021115
TSR:	Danielle Winnings

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS20021115-01**	**LH18/24-SP650_022520**	**Water**	**25 Feb 2020 14:00**
	TOC Analysis for DOD Level IV			05 Mar 2020

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. Maguire Date/Time: 2/27/20 2/26/20 18:00

Received By: [signature] Date/Time: 2/28/2020 0940

Cooler ID(s): Temperature(s):

00970036

PC KL

Cooler Receipt and Preservation Form

Client ALS Houston Service Request K2001717

Received: 2/28/2020 Opened: 2/28/2020 By: CG Unloaded: 2/28/2020 By: CG

1. Samples were received via? *USPS* (*Fed Ex*) *UPS* *DHL* *PDX* *Courier* *Hand Delivered*
2. Samples were received in: (circle) (*Cooler*) *Box* *Envelope* *Other* _____ *NA*
3. Were custody seals on coolers? NA (Y) N If yes, how many and where? 2 front
   If present, were custody seals intact? (Y) N If present, were they signed and dated? (Y) N

Raw Cooler Temp	Corrected Cooler Temp	Raw Temp Blank	Corrected Temp Blank	Corr. Factor	Thermometer ID	Cooler/COC ID NA	Tracking Number NA	File
-0.9	-0.9	-0.1	-0.1	0.0	403	13413	1251 0294 9096	

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

Sample ID on Bottle	Sample ID on COC	Identified by:

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

Notes, Discrepancies, & Resolutions: Received 2 samples: HS20021115-01 & HS20021115-02. Only 1 sample listed on COC.
Client ID's: (-01) LH18/24-SP650 022520, (-02) LH18/24-SP650 022520 BIX

RUSH

General Chemistry

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	K2001717
Project:	HS20021115	**Date Collected:**	02/25/20
Sample Matrix:	Water	**Date Received:**	02/28/20
Analysis Method:	SM 5310 C	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA

Carbon, Total Organic

Sample Name	Lab Code	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
LH18/24-SP650_022520	K2001717-001	**1.30**	0.50	0.20	0.07	1	03/03/20 13:21	
Method Blank	K2001717-MB	ND U	0.50	0.20	0.07	1	03/03/20 12:51	

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	K2001717
Project	HS20021115	**Date Collected:**	02/25/20
Sample Matrix:	Water	**Date Received:**	02/28/20
		Date Analyzed:	03/03/20

Replicate Sample Summary
General Chemistry Parameters

Sample Name:	LH18/24-SP650_022520	**Units:**	mg/L
Lab Code:	K2001717-001	**Basis:**	NA

Analyte Name	Analysis Method	LOQ	LOD	MDL	Sample Result	Duplicate Sample K2001717-001DUP Result	Average	RPD	RPD Limit
Carbon, Total Organic	SM 5310 C	0.50	0.20	0.07	1.30	1.22	1.26	6	10

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

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

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

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	K2001717
Project:	HS20021115	**Date Collected:**	02/25/20
Sample Matrix:	Water	**Date Received:**	02/28/20
		Date Analyzed:	03/3/20
		Date Extracted:	NA

Matrix Spike Summary
Carbon, Total Organic

Sample Name:	LH18/24-SP650_022520	**Units:**	mg/L
Lab Code:	K2001717-001	**Basis:**	NA
Analysis Method:	SM 5310 C		
Prep Method:	None		

Matrix Spike
K2001717-001MS

Analyte Name	Sample Result	Result	Spike Amount	% Rec	% Rec Limits
Carbon, Total Organic	1.30	29.3	25.0	112	83-117

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

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

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

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	K2001717
Project:	HS20021115	**Date Analyzed:**	03/03/20
Sample Matrix:	Water	**Date Extracted:**	NA

Lab Control Sample Summary
Carbon, Total Organic

Analysis Method:	SM 5310 C	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA
		Analysis Lot:	672040

Sample Name	Lab Code	Result	Spike Amount	% Rec	% Rec Limits
Lab Control Sample	K2001717-LCS	26.2	25.0	105	83-117

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US **Service Request:** K2001717
Project: HS20021115

Continuing Calibration Verification (CCV) Summary

Carbon, Total Organic

Analysis Method: SM 5310 C **Units:** mg/L

	Analysis Lot	Lab Code	Date Analyzed	True Value	Measured Value	Percent Recovery	Acceptance Limits
CCV1	672040	KQ2003043-01	03/03/20 12:22	25.0	26.5	106	90-110
CCV2	672040	KQ2003043-02	03/03/20 16:38	25.0	26.9	108	90-110
CCV3	672040	KQ2003043-03	03/03/20 21:49	25.0	26.3	105	90-110
CCV4	672040	KQ2003043-04	03/03/20 23:14	25.0	26.6	106	90-110

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US **Service Request:**K2001717
Project: HS20021115

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	672040	KQ2003043-05	03/03/20 12:37	0.50	0.20	0.07	ND	U
CCB2	672040	KQ2003043-06	03/03/20 16:53	0.50	0.20	0.07	ND	U
CCB3	672040	KQ2003043-07	03/03/20 22:03	0.50	0.20	0.07	ND	U
CCB4	672040	KQ2003043-08	03/03/20 23:29	0.50	0.20	0.07	ND	U

Raw Data

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General Chemistry

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Work Request # Original ( ) 1200732, 1758, 1559, 1597, 1698, 1700, 1702, 1705, 1717,
IV IV II II I IV

Tier:

Date Analyzed: 3/12/20

Analyst: BP

Analysis: TOC/DOC

TOC: 672059, 672040

Run #

DATA QUALITY REPORT
INORGANICS

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

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

COMMENTS:

Final Approved by: Date: 03/

DQREPORT

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 672039 **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
K2001732-001	Carbon, Total Organic (TOC)	N/A		Ground Water	0.89 mg/L	10 mL	0.89 mg/L	1		0.50			3/2/20 21:56:00	N	IV
K2001732-002	Carbon, Total Organic (TOC)	N/A		Ground Water	2.12 mg/L	10 mL	2.12 mg/L	1		0.50			3/3/20 00:02:00	N	IV
K2001732-003	Carbon, Total Organic (TOC)	N/A		Ground Water	4.83 mg/L	10 mL	4.83 mg/L	1		0.50			3/3/20 00:58:00	N	IV
K2001732-004	Carbon, Total Organic (TOC)	N/A		Ground Water	1.51 mg/L	10 mL	1.51 mg/L	1		0.50			3/3/20 01:53:00	N	IV
K2001732-005	Carbon, Total Organic (TOC)	N/A		Ground Water	1.34 mg/L	10 mL	1.34 mg/L	1		0.50			3/3/20 02:49:00	N	IV
K2001732-006	Carbon, Total Organic (TOC)	N/A		Ground Water	8.06 mg/L	10 mL	8.06 mg/L	1		0.50			3/3/20 04:14:00	N	IV
K2001732-007	Carbon, Total Organic (TOC)	N/A		Ground Water	4.09 mg/L	10 mL	4.09 mg/L	1		0.50			3/3/20 05:10:00	N	IV
K2001732-008	Carbon, Total Organic (TOC)	N/A		Ground Water	0.54 mg/L	10 mL	5.4 mg/L	10		5.0			3/3/20 06:06:00	N	IV
K2001732-009	Carbon, Total Organic (TOC)	N/A		Ground Water	9.17 mg/L	10 mL	9.17 mg/L	1		0.50			3/3/20 07:01:00	N	IV
K2001732-011	Carbon, Total Organic (TOC)	N/A		Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1		0.50			3/3/20 08:25:00	N	IV
K2001732-012	Carbon, Total Organic (TOC)	N/A		Ground Water	0.11 mg/L	10 mL	0.50 mg/L U	1		0.50			3/3/20 09:20:00	N	IV
K2001758-004	Carbon, Total Organic (TOC)	N/A		Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1		0.50			3/3/20 11:26:00	N	IV
KQ2003042-01	Carbon, Total Organic (TOC)	CCV		Ground Water	26.75 mg/L	10 mL	26.7 mg/L	1					3/2/20 19:20:00	N	II
KQ2003042-02	Carbon, Total Organic (TOC)	CCV		Ground Water	27.05 mg/L	10 mL	27.1 mg/L	1					3/3/20 03:45:00	N	II
KQ2003042-03	Carbon, Total Organic (TOC)	CCV		Ground Water	26.50 mg/L	10 mL	26.5 mg/L	1					3/3/20 12:22:00	N	II
KQ2003042-04	Carbon, Total Organic (TOC)	CCB		Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1		0.50			3/2/20 19:35:00	N	II
KQ2003042-05	Carbon, Total Organic (TOC)	CCB		Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1		0.50			3/3/20 03:59:00	N	II
KQ2003042-06	Carbon, Total Organic (TOC)	CCB		Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1		0.50			3/3/20 12:37:00	N	II
KQ2003042-07	Carbon, Total Organic (TOC)	MB		Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1		0.50			3/2/20 19:50:00	N	II
KQ2003042-08	Carbon, Total Organic (TOC)	MB		Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1		0.50			3/2/20 19:50:00	N	II
KQ2003042-09	Carbon, Total Organic (TOC)	MB		Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1		0.50			3/2/20 19:50:00	N	II
KQ2003042-10	Carbon, Total Organic (TOC)	MB		Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1		0.50			3/2/20 19:50:00	N	II
KQ2003042-11	Carbon, Total Organic (TOC)	LCS		Ground Water	26.16 mg/L	10 mL	26.2 mg/L	1		0.50	105		3/2/20 20:46:00	N	II

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

03/05/20

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 672039 **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
KQ2003042-12	Carbon, Total Organic (TOC)	LCS		Ground Water	26.06 mg/L	10 mL	26.1 mg/L	1		0.50	104		3/2/20 20:46:00	N	II
KQ2003042-13	Carbon, Total Organic (TOC)	LCS		Ground Water	26.08 mg/L	10 mL	26.1 mg/L	1		0.50	104		3/2/20 20:46:00	N	II
KQ2003042-14	Carbon, Total Organic (TOC)	LCS		Ground Water	26.35 mg/L	10 mL	26.4 mg/L	1		0.50	105		3/2/20 20:46:00	N	II
KQ2003042-15	Carbon, Total Organic (TOC)	MS	K2001732-001	Ground Water	29.04 mg/L	10 mL	29.0 mg/L	1		0.50	113		3/2/20 22:52:00	N	II
KQ2003042-16	Carbon, Total Organic (TOC)	MS	K2001732-001	Ground Water	28.99 mg/L	10 mL	29.0 mg/L	1		0.50	112		3/2/20 22:52:00	N	II
KQ2003042-17	Carbon, Total Organic (TOC)	MS	K2001732-001	Ground Water	28.87 mg/L	10 mL	28.9 mg/L	1		0.50	112		3/2/20 22:52:00	N	II
KQ2003042-18	Carbon, Total Organic (TOC)	MS	K2001732-001	Ground Water	29.09 mg/L	10 mL	29.1 mg/L	1		0.50	113		3/2/20 22:52:00	N	II
KQ2003042-19	Carbon, Total Organic (TOC)	MS	K2001732-012	Ground Water	28.17 mg/L	10 mL	28.2 mg/L	1		0.50	113		3/3/20 10:16:00	N	II
KQ2003042-20	Carbon, Total Organic (TOC)	MS	K2001732-012	Ground Water	28.58 mg/L	10 mL	28.6 mg/L	1		0.50	114		3/3/20 10:16:00	N	II
KQ2003042-21	Carbon, Total Organic (TOC)	MS	K2001732-012	Ground Water	27.96 mg/L	10 mL	28.0 mg/L	1		0.50	112		3/3/20 10:16:00	N	II
KQ2003042-22	Carbon, Total Organic (TOC)	MS	K2001732-012	Ground Water	28.14 mg/L	10 mL	28.1 mg/L	1		0.50	113		3/3/20 10:16:00	N	II
KQ2003042-23	Carbon, Total Organic (TOC)	DUP	K2001758-004	Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1		0.50		NC	3/3/20 11:26:00	N	II
KQ2003042-24	Carbon, Total Organic (TOC)	TRP	K2001758-004	Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1		0.50		NC	3/3/20 11:26:00	N	II
KQ2003042-25	Carbon, Total Organic (TOC)	QUAD	K2001758-004	Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1		0.50		NC	3/3/20 11:26:00	N	II
KQ2003042-26	Carbon, Total Organic (TOC)	DUP	K2001732-001	Ground Water	0.86 mg/L	10 mL	0.86 mg/L	1		0.50		3	3/2/20 21:56:00	N	II
KQ2003042-27	Carbon, Total Organic (TOC)	TRP	K2001732-001	Ground Water	0.84 mg/L	10 mL	0.84 mg/L	1		0.50		3	3/2/20 21:56:00	N	II
KQ2003042-28	Carbon, Total Organic (TOC)	QUAD	K2001732-001	Ground Water	0.79 mg/L	10 mL	0.79 mg/L	1		0.50		5	3/2/20 21:56:00	N	II
KQ2003042-29	Carbon, Total Organic (TOC)	DUP	K2001732-002	Ground Water	2.07 mg/L	10 mL	2.07 mg/L	1		0.50		2	3/3/20 00:02:00	N	II
KQ2003042-30	Carbon, Total Organic (TOC)	TRP	K2001732-002	Ground Water	2.08 mg/L	10 mL	2.08 mg/L	1		0.50		1	3/3/20 00:02:00	N	II
KQ2003042-31	Carbon, Total Organic (TOC)	QUAD	K2001732-002	Ground Water	2.01 mg/L	10 mL	2.01 mg/L	1		0.50		2	3/3/20 00:02:00	N	II
KQ2003042-32	Carbon, Total Organic (TOC)	DUP	K2001732-003	Ground Water	4.73 mg/L	10 mL	4.73 mg/L	1		0.50		2	3/3/20 00:58:00	N	II
KQ2003042-33	Carbon, Total Organic (TOC)	TRP	K2001732-003	Ground Water	4.72 mg/L	10 mL	4.72 mg/L	1		0.50		1	3/3/20 00:58:00	N	II
KQ2003042-34	Carbon, Total Organic (TOC)	QUAD	K2001732-003	Ground Water	4.74 mg/L	10 mL	4.74 mg/L	1		0.50		1	3/3/20 00:58:00	N	II

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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:** 672039 **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
KQ2003042-35	Carbon, Total Organic (TOC)	DUP	K2001732-004	Ground Water	1.45 mg/L	10 mL	1.45 mg/L	1		0.50		4	3/3/20 01:53:00	N	II
KQ2003042-36	Carbon, Total Organic (TOC)	TRP	K2001732-004	Ground Water	1.44 mg/L	10 mL	1.44 mg/L	1		0.50		3	3/3/20 01:53:00	N	II
KQ2003042-37	Carbon, Total Organic (TOC)	QUAD	K2001732-004	Ground Water	1.44 mg/L	10 mL	1.44 mg/L	1		0.50		3	3/3/20 01:53:00	N	II
KQ2003042-38	Carbon, Total Organic (TOC)	DUP	K2001732-005	Ground Water	1.27 mg/L	10 mL	1.27 mg/L	1		0.50		5	3/3/20 02:49:00	N	II
KQ2003042-39	Carbon, Total Organic (TOC)	TRP	K2001732-005	Ground Water	1.36 mg/L	10 mL	1.36 mg/L	1		0.50		3	3/3/20 02:49:00	N	II
KQ2003042-40	Carbon, Total Organic (TOC)	QUAD	K2001732-005	Ground Water	1.31 mg/L	10 mL	1.31 mg/L	1		0.50		3	3/3/20 02:49:00	N	II
KQ2003042-41	Carbon, Total Organic (TOC)	DUP	K2001732-006	Ground Water	8.11 mg/L	10 mL	8.11 mg/L	1		0.50		<1	3/3/20 04:14:00	N	II
KQ2003042-42	Carbon, Total Organic (TOC)	TRP	K2001732-006	Ground Water	8.13 mg/L	10 mL	8.13 mg/L	1		0.50		<1	3/3/20 04:14:00	N	II
KQ2003042-43	Carbon, Total Organic (TOC)	QUAD	K2001732-006	Ground Water	8.17 mg/L	10 mL	8.17 mg/L	1		0.50		<1	3/3/20 04:14:00	N	II
KQ2003042-44	Carbon, Total Organic (TOC)	DUP	K2001732-007	Ground Water	3.98 mg/L	10 mL	3.98 mg/L	1		0.50		3	3/3/20 05:10:00	N	II
KQ2003042-45	Carbon, Total Organic (TOC)	TRP	K2001732-007	Ground Water	3.99 mg/L	10 mL	3.99 mg/L	1		0.50		1	3/3/20 05:10:00	N	II
KQ2003042-46	Carbon, Total Organic (TOC)	QUAD	K2001732-007	Ground Water	3.94 mg/L	10 mL	3.94 mg/L	1		0.50		2	3/3/20 05:10:00	N	II
KQ2003042-47	Carbon, Total Organic (TOC)	DUP	K2001732-008	Ground Water	0.56 mg/L	10 mL	5.6 mg/L	10		5.0		4	3/3/20 06:06:00	N	II
KQ2003042-48	Carbon, Total Organic (TOC)	TRP	K2001732-008	Ground Water	0.54 mg/L	10 mL	5.4 mg/L	10		5.0		3	3/3/20 06:06:00	N	II
KQ2003042-49	Carbon, Total Organic (TOC)	QUAD	K2001732-008	Ground Water	0.56 mg/L	10 mL	5.6 mg/L	10		5.0		3	3/3/20 06:06:00	N	II
KQ2003042-50	Carbon, Total Organic (TOC)	DUP	K2001732-009	Ground Water	9.02 mg/L	10 mL	9.02 mg/L	1		0.50		2	3/3/20 07:01:00	N	II
KQ2003042-51	Carbon, Total Organic (TOC)	TRP	K2001732-009	Ground Water	9.03 mg/L	10 mL	9.03 mg/L	1		0.50		<1	3/3/20 07:01:00	N	II
KQ2003042-52	Carbon, Total Organic (TOC)	QUAD	K2001732-009	Ground Water	9.10 mg/L	10 mL	9.10 mg/L	1		0.50		<1	3/3/20 07:01:00	N	II
KQ2003042-53	Carbon, Total Organic (TOC)	DUP	K2001732-011	Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1		0.50		NC	3/3/20 08:25:00	N	II
KQ2003042-54	Carbon, Total Organic (TOC)	TRP	K2001732-011	Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1		0.50		NC	3/3/20 08:25:00	N	II
KQ2003042-55	Carbon, Total Organic (TOC)	QUAD	K2001732-011	Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1		0.50		NC	3/3/20 08:25:00	N	II
KQ2003042-56	Carbon, Total Organic (TOC)	DUP	K2001732-012	Ground Water	0.08 mg/L	10 mL	0.50 mg/L U	1		0.50		NC	3/3/20 09:20:00	N	II
KQ2003042-57	Carbon, Total Organic (TOC)	TRP	K2001732-012	Ground Water	0.11 mg/L	10 mL	0.50 mg/L U	1		0.50		NC	3/3/20 09:20:00	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:** 672039 **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
KQ2003042-58	Carbon, Total Organic (TOC)	QUAD	K2001732-012	Ground Water	0.12 mg/L	10 mL	0.50 mg/L U	1		0.50		NC	3/3/20 09:20:00	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:** 672040 **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
K2001559-002	Carbon, Total Organic	N/A		Water	4.81 mg/L	10 mL	48.1 mg/L	10	0.7	5.0			3/3/20 18:32:00	N	I
K2001597-001	Carbon, Total Organic	N/A		Water	12.04 mg/L	10 mL	60.2 mg/L	5	0.4	2.5			3/3/20 22:46:00	N	I
K2001698-002	Carbon, Total Organic	N/A		Water	36.73 mg/L	10 mL	36.7 mg/L	1	0.07	0.50			3/3/20 14:46:00	N	II
K2001700-001	Carbon, Total Organic	N/A		Water	11.24 mg/L	10 mL	11.2 mg/L	1	0.07	0.50			3/3/20 15:14:00	N	II
K2001700-002	Carbon, Total Organic	N/A		Water	3.66 mg/L	10 mL	3.66 mg/L	1	0.07	0.50			3/3/20 15:42:00	N	II
K2001700-003	Carbon, Total Organic	N/A		Water	0.24 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			3/3/20 16:10:00	N	II
K2001700-004	Carbon, Total Organic	N/A		Water	3.18 mg/L	10 mL	3.18 mg/L	1	0.07	0.50			3/3/20 17:08:00	N	II
K2001702-001	Carbon, Total Organic	N/A		Water	14.87 mg/L	10 mL	14.9 mg/L	1	0.07	0.50			3/3/20 19:00:00	N	II
K2001702-002	Carbon, Total Organic	N/A		Water	15.46 mg/L	10 mL	15.5 mg/L	1	0.07	0.50			3/3/20 19:28:00	N	II
K2001705-001	Carbon, Total Organic	N/A		Water	3.62 mg/L	10 mL	3.62 mg/L	1	0.07	0.50			3/3/20 19:56:00	N	I
K2001705-002	Carbon, Total Organic	N/A		Water	1.64 mg/L	10 mL	1.64 mg/L	1	0.07	0.50			3/3/20 20:24:00	N	I
K2001705-003	Carbon, Total Organic	N/A		Water	1.44 mg/L	10 mL	1.44 mg/L	1	0.07	0.50			3/3/20 20:53:00	N	I
K2001705-004	Carbon, Total Organic	N/A		Water	1.75 mg/L	10 mL	1.75 mg/L	1	0.07	0.50			3/3/20 21:21:00	N	I
K2001705-005	Carbon, Total Organic	N/A		Water	1.51 mg/L	10 mL	1.51 mg/L	1	0.07	0.50			3/3/20 22:18:00	N	I
K2001717-001	Carbon, Total Organic	N/A		Water	1.30 mg/L	10 mL	1.30 mg/L	1	0.07	0.50			3/3/20 13:21:00	N	IV
KQ2003043-01	Carbon, Total Organic	CCV		Water	26.50 mg/L	10 mL	26.5 mg/L	1					3/3/20 12:22:00	N	IV
KQ2003043-02	Carbon, Total Organic	CCV		Water	26.92 mg/L	10 mL	26.9 mg/L	1					3/3/20 16:38:00	N	IV
KQ2003043-03	Carbon, Total Organic	CCV		Water	26.31 mg/L	10 mL	26.3 mg/L	1					3/3/20 21:49:00	N	IV
KQ2003043-04	Carbon, Total Organic	CCV		Water	26.60 mg/L	10 mL	26.6 mg/L	1					3/3/20 23:14:00	N	IV
KQ2003043-05	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			3/3/20 12:37:00	N	IV
KQ2003043-06	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			3/3/20 16:53:00	N	IV
KQ2003043-07	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			3/3/20 22:03:00	N	IV
KQ2003043-08	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			3/3/20 23:29:00	N	IV
KQ2003043-09	Carbon, Total Organic	MB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			3/3/20 12:51:00	N	IV
KQ2003043-10	Carbon, Total Organic	LCS		Water	26.21 mg/L	10 mL	26.2 mg/L	1	0.07	0.50	105		3/3/20 13:06:00	N	IV
KQ2003043-11	Carbon, Total Organic	MS	K2001717-001	Water	29.26 mg/L	10 mL	29.3 mg/L	1	0.07	0.50	112		3/3/20 13:49:00	N	IV
KQ2003043-12	Carbon, Total Organic	DUP	K2001559-002	Water	4.70 mg/L	10 mL	47.0 mg/L	10	0.7	5.0		2	3/3/20 18:32:00	N	I
KQ2003043-13	Carbon, Total Organic	DUP	K2001597-001	Water	12.05 mg/L	10 mL	60.3 mg/L	5	0.4	2.5		<1	3/3/20 22:46:00	N	I
KQ2003043-14	Carbon, Total Organic	DUP	K2001698-002	Water	36.30 mg/L	10 mL	36.3 mg/L	1	0.07	0.50		1	3/3/20 14:46:00	N	II
KQ2003043-16	Carbon, Total Organic	DUP	K2001700-002	Water	3.58 mg/L	10 mL	3.58 mg/L	1	0.07	0.50		2	3/3/20 15:42:00	N	II
KQ2003043-17	Carbon, Total Organic	DUP	K2001700-003	Water	0.08 mg/L	10 mL	0.08 mg/L J	1	0.07	0.50		NC	3/3/20 16:10:00	N	II
KQ2003043-18	Carbon, Total Organic	DUP	K2001700-004	Water	3.15 mg/L	10 mL	3.15 mg/L	1	0.07	0.50		<1	3/3/20 17:08:00	N	II
KQ2003043-19	Carbon, Total Organic	DUP	K2001700-001	Water	10.98 mg/L	10 mL	11.0 mg/L	1	0.07	0.50		2	3/3/20 15:14:00	N	II
KQ2003043-21	Carbon, Total Organic	DUP	K2001705-001	Water	3.55 mg/L	10 mL	3.55 mg/L	1	0.07	0.50		2	3/3/20 19:56:00	N	I
KQ2003043-22	Carbon, Total Organic	DUP	K2001705-002	Water	1.61 mg/L	10 mL	1.61 mg/L	1	0.07	0.50		2	3/3/20 20:24:00	N	I
KQ2003043-23	Carbon, Total Organic	DUP	K2001705-003	Water	1.48 mg/L	10 mL	1.48 mg/L	1	0.07	0.50		2	3/3/20 20:53:00	N	I

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

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 672040 **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
KQ2003043-24	Carbon, Total Organic	DUP	K2001705-004	Water	1.69 mg/L	10 mL	1.69 mg/L	1	0.07	0.50		3	3/3/20 21:21:00	N	I
KQ2003043-25	Carbon, Total Organic	DUP	K2001705-005	Water	1.55 mg/L	10 mL	1.55 mg/L	1	0.07	0.50		3	3/3/20 22:18:00	N	I
KQ2003043-26	Carbon, Total Organic	DUP	K2001702-001	Water	14.11 mg/L	10 mL	14.1 mg/L	1	0.07	0.50		5	3/3/20 19:00:00	N	II
KQ2003043-27	Carbon, Total Organic	DUP	K2001702-002	Water	14.78 mg/L	10 mL	14.8 mg/L	1	0.07	0.50		5	3/3/20 19:28:00	N	II
KQ2003043-28	Carbon, Total Organic	DUP	K2001717-001	Water	1.22 mg/L	10 mL	1.22 mg/L	1	0.07	0.50		6	3/3/20 13:21:00	N	IV

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

TOC; 672039, 672040

Schedule: 03022020

Version: 3
Instrument: Fusion1
Last Saved by: Fusion1 (Fusion1)
Last Saved on: 2020/03/02 16:51 - Monday

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	K2001732-001.07	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
4	Sample	K2001732-001.07 ms	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
5	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
6	Sample	K2001732-002.07	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
7	Sample	K2001732-003.07	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
8	Sample	K2001732-004.07	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
9	Sample	K2001732-005.07	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	K2001732-006.07	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
11	Sample	K2001732-007.07	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
12	Sample	K2001732-008.07 10x	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
13	Sample	K2001732-009.07	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
14	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
15	Sample	K2001732-011.07	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
16	Sample	K2001732-012.07	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
17	Sample	K2001732-012.07 ms	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
18	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
19	Sample	K2001758-004.01	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
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	K2001717-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
22	Sample	K2001717-001.01 ms	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
23	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
24	Sample	K2001698-001.02	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
25	Sample	K2001698-002.02	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
26	Sample	K2001700-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
27	Sample	K2001700-002.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
28	Sample	K2001700-003.01	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	K2001700-004.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
30	Sample	K2001700-005.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
31	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
32	Sample	K2001559-002.02 10x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
33	Sample	K2001702-001.04	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
34	Sample	K2001702-002.04	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
35	Sample	K2001705-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
36	Sample	K2001705-002.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
37	Sample	K2001705-003.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
38	Sample	K2001705-004.01	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

3/5/20

Schedule: 03022020

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	K2001705-005.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
40	Sample	K2001597-001.02 5x	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	

Fusion Report - 03022020
Monday, March 02, 2020 04:32 PM

(View - Reps, Unused Reps, Meta-Data, Signature, History)
Printed on 2020/03/04 09:06 - Wednesday

Report Summary Information

Company Location:	Gen Chem Lab		
Schedule Name:	03022020	Engine Version:	1.1.5.1
Instrument Name:	Fusion1	Firmware Version:	1.2.0696
Report Version:	1 of 1	Connection:	RS232 COM1
Report Creation by Operators (schedule version):	Fusion1 (Fusion1) (v2) Fusion1 (Fusion1) (v3)		
Comment:			

Report Results

03/05/20

Sample Type: Clean — From Schedule Version 2

	Pos	Analysis Type	Sample ID	Start Time
◆	(clean)		Clean	2020/03/02 16:32

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	15.93	20.00	4.07	48.99	07:58
2	TC Clean	13.32	17.40	4.08	48.75	07:16
3	TC Clean	3.02	7.05	4.03	48.77	07:01
4	TC Clean	2.25	6.23	3.98	48.80	07:00

Sample Type: Clean — From Schedule Version 3

	Pos	Analysis Type	Sample ID	Start Time
◆	(clean)		Clean	2020/03/02 17:06

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	1.19	5.16	3.97	48.99	07:57
2	TC Clean	5.51	9.69	4.18	48.84	07:17
3	TC Clean	1.81	5.88	4.07	48.81	07:00
4	TC Clean	1.58	5.36	3.77	48.83	07:01

Sample Type: Clean From Schedule Version 3

	Pos	Analysis Type	Sample ID	Start Time
◆	(clean)		Clean	2020/03/02 17:40

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	0.82	4.64	3.82	49.07	07:59
2	TC Clean	4.86	8.65	3.78	48.80	07:17
3	TC Clean	1.83	5.74	3.92	48.86	07:01
4	TC Clean	1.54	5.40	3.86	48.95	07:00

Sample Type: Blank (Creating v1359) From Schedule Version 3

	Pos	Analysis Type	Sample ID	Start Time
◆	(blank)		Reagent/Acid Blank	2020/03/02 18:14

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	9.11	13.06	3.95	49.04	08:01
2	TC Clean	4.54	8.40	3.86	48.87	07:17
3	TC Clean	1.72	5.53	3.81	48.96	07:04
4	TC Clean	1.33	5.16	3.83	48.81	07:02
5	Reagent Blank	3.07	7.04	3.97	48.89	08:12
6	Acid Blank	1.21	5.14	3.93	49.15	08:04

Sample Type: Sample From Schedule Version 3

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	D	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2020/03/02 19:06

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	8.39	12.33	3.93	48.90	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.3847 (IC) (v1359)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 3

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	26.7456 ppm (PASS)	0.0000 ppm	0%	2020/03/02 19:20

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	26.7456	267.4562	179.31	183.40	4.09	48.96	10:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)	50 ppmC

Sample Type: Check Standard --> CCB From Schedule Version 3

	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%	2020/03/02 19:35

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	6.68	10.55	3.86	48.97	10:32

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)	0 ppmC

Sample Type: Sample From Schedule Version 3

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	1	TOC	MB1	0.0000 ppm	0.0000 ppm	0.0000%	2020/03/02 19:50

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	5.83	9.70	3.86	48.95	10:28
2	TOC	0.0000	0.0000	5.92	9.84	3.92	48.97	10:26
3	TOC	0.0000	0.0000	5.69	9.56	3.88	48.98	10:29
4	TOC	0.0000	0.0000	5.61	9.56	3.95	48.96	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.3847 (IC) (v1359)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

Sample Type: Check Standard --> LCS From Schedule Version 3

	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)	26.1623 ppm	0.1359 ppm	0.52%	2020/03/02 20:46

						(PASS)				

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	26.1617	261.6171	175.62	179.33	3.71	48.93	10:29
C	TOC	25.0 ppm	2	26.0550	260.5495	174.94	178.73	3.79	48.93	10:25
C	TOC	25.0 ppm	3	26.0782	260.7820	175.09	178.92	3.83	48.90	10:29
C	TOC	25.0 ppm	4	26.3542	263.5418	176.83	180.59	3.76	48.89	10:27

Completion State	Success Action	Method	Calibration	STD Conc - Pos C
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)	25 ppmC

Sample Type: Sample From Schedule Version 3

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	2	TOC	ICS	0.0000 ppm	0.0000 ppm	0.0000%	2020/03/02 21:42

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	9.20	12.97	3.76	48.91	10:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.3847 (IC) (v1359)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	3	TOC	K2001732-001.07	0.8443 ppm	0.0448 ppm	5.3100%	2020/03/02 21:56

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.8905	8.9047	15.02	18.92	3.91	48.86	10:28
2	TOC	0.8642	8.6422	14.85	18.65	3.80	48.87	10:25
3	TOC	0.8370	8.3701	14.68	18.51	3.83	48.86	10:30
4	TOC	0.7856	7.8561	14.35	18.16	3.81	48.84	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.3847 (IC) (v1359)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	4	TOC	K2001732-001.07 ms	28.9966 ppm	0.0949 ppm	0.3300%	2020/03/02 22:52

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	29.0886	290.8861	193.31	197.08	3.77	48.84	10:26
2	TOC	28.8693	288.6925	191.92	195.92	4.00	48.85	10:26
3	TOC	28.9852	289.8518	192.65	196.56	3.91	48.85	10:24
4	TOC	29.0435	290.4354	193.02	196.76	3.73	48.85	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.3847 (IC)	CAS_salt_010711	CAS_salt_010711

(v1359) (v4) (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	5	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2020/03/02 23:47

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.64	10.35	3.72	48.82	10:32

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.3847 (IC) (v1359)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	6	TOC	K2001732-002.07	2.0709 ppm	0.0448 ppm	2.1600%	2020/03/03 00:02

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.1198	21.1983	22.79	26.49	3.70	48.83	10:30
2	TOC	2.0727	20.7270	22.49	26.19	3.70	48.80	10:25
3	TOC	2.0797	20.7965	22.53	26.32	3.79	48.83	10:32
4	TOC	2.0113	20.1133	22.10	26.08	3.97	48.83	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.3847 (IC) (v1359)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	7	TOC	K2001732-003.07	4.7569 ppm	0.0479 ppm	1.0100%	2020/03/03 00:58

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.8280	48.2795	39.91	43.76	3.85	48.80	10:27
2	TOC	4.7346	47.3464	39.32	43.10	3.78	48.81	10:26
3	TOC	4.7237	47.2372	39.25	43.12	3.87	48.79	10:27
4	TOC	4.7413	47.4128	39.36	43.10	3.73	48.80	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.3847 (IC) (v1359)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	8	TOC	K2001732-004.07	1.4581 ppm	0.0366 ppm	2.5100%	2020/03/03 01:53

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.5123	15.1235	18.95	22.62	3.68	48.81	10:29
2	TOC	1.4477	14.4766	18.54	22.24	3.70	48.80	10:32
3	TOC	1.4367	14.3675	18.47	22.31	3.84	48.79	10:28
4	TOC	1.4355	14.3548	18.46	22.29	3.83	48.82	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.3847 (IC) (v1359)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.3406	13.4059	17.86	21.64	3.78	48.81	10:32
2	TOC	1.2735	12.7353	17.44	21.28	3.84	48.81	10:27
3	TOC	1.3558	13.5577	17.96	21.71	3.75	48.80	10:29
4	TOC	1.3104	13.1038	17.67	21.53	3.86	48.81	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.3847 (IC) (v1359)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 3

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	27.0531 ppm (PASS)	0.0000 ppm	0%	2020/03/03 03:45

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	27.0531	270.5308	181.25	185.09	3.84	48.83	10:29

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)	50 ppmC

Sample Type: Check Standard --> CCB From Schedule Version 3

	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%	2020/03/03 03:59

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	9.58	3.88	48.80	10:32

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)	0 ppmC

Sample Type: Sample From Schedule Version 3

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	10	TOC	K2001732-006.07	8.1189 ppm	0.0452 ppm	0.5600%	2020/03/03 04:14

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	8.0629	80.6290	60.36	64.28	3.91	48.78	10:30
2	TOC	8.1119	81.1192	60.68	64.50	3.83	48.79	10:26
3	TOC	8.1287	81.2869	60.78	64.63	3.85	48.79	10:24
4	TOC	8.1722	81.7218	61.06	64.97	3.91	48.79	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.3847 (IC) (v1359)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	11	TOC	K2001732-007.07	3.9996 ppm	0.0620 ppm	1.5500%	2020/03/03 05:10

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.0873	40.8730	35.23	39.03	3.81	48.77	10:28
2	TOC	3.9843	39.8434	34.58	38.47	3.90	48.80	10:28
3	TOC	3.9853	39.8529	34.58	38.42	3.84	48.80	10:28
4	TOC	3.9413	39.4132	34.30	38.14	3.83	48.81	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.3847 (IC) (v1359)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	12	TOC	K2001732-008.07 10x	0.5505 ppm	0.0150 ppm	2.7300%	2020/03/03 06:06

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.5386	5.3857	12.79	16.51	3.72	48.81	10:26
2	TOC	0.5629	5.6293	12.94	16.64	3.70	48.78	10:29
3	TOC	0.5365	5.3652	12.78	16.64	3.87	48.79	10:27
4	TOC	0.5640	5.6404	12.95	16.66	3.71	48.80	10:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.3847 (IC) (v1359)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	13	TOC	K2001732-009.07	9.0816 ppm	0.0685 ppm	0.7500%	2020/03/03 07:01

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	9.1728	91.7284	67.38	71.08	3.69	48.80	10:24
2	TOC	9.0248	90.2481	66.45	70.19	3.74	48.79	10:27
3	TOC	9.0332	90.3319	66.50	70.35	3.85	48.78	10:29
4	TOC	9.0955	90.9550	66.89	70.79	3.89	48.81	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.3847 (IC) (v1359)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis	Sample ID	Result (ppmC)	Std. Dev.	RSD	Start Time

		Type			(ppmC)		
◆	14	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2020/03/03 07:57

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	5.71	9.62	3.91	48.82	10:27
2	TOC	0.0000	0.0000	5.48	9.29	3.81	48.84	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.3847 (IC) (v1359)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	15	TOC	K2001732-011.07	0.0000 ppm	0.0000 ppm	0.0000%	2020/03/03 08:25

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	5.32	9.21	3.89	48.84	10:27
2	TOC	0.0000	0.0000	5.57	9.37	3.79	48.84	10:27
3	TOC	0.0000	0.0000	5.19	9.09	3.90	48.82	10:25
4	TOC	0.0000	0.0000	5.34	9.16	3.82	48.86	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.3847 (IC) (v1359)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	16	TOC	K2001732-012.07	0.1059 ppm	0.0159 ppm	15.0000%	2020/03/03 09:20

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.1136	1.1360	10.10	13.67	3.56	48.85	10:27
2	TOC	0.0840	0.8403	9.92	13.66	3.75	48.87	10:26
3	TOC	0.1054	1.0538	10.05	13.79	3.74	48.86	10:25
4	TOC	0.1207	1.2072	10.15	13.96	3.81	48.87	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.3847 (IC) (v1359)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	17	TOC	K2001732-012.07 ms	28.2139 ppm	0.2638 ppm	0.9300%	2020/03/03 10:16

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	28.1411	281.4110	187.32	191.21	3.90	48.85	10:28
2	TOC	27.9586	279.5858	186.16	190.03	3.87	48.84	10:29
3	TOC	28.5835	285.8346	190.11	193.89	3.78	48.82	10:28
4	TOC	28.1726	281.7257	187.52	191.35	3.83	48.84	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.3847 (IC) (v1359)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

		Analysis			Std. Dev.		

	Pos	Type	Sample ID	Result (ppmC)	(ppmC)	RSD	Start Time
◆	18	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2020/03/03 11:12

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	5.86	9.62	3.77	48.82	10:32

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.3847 (IC) (v1359)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	19	TOC	K2001758-004.01	0.0000 ppm	0.0000 ppm	0.0000%	2020/03/03 11:26

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	5.40	9.17	3.78	48.81	10:27
2	TOC	0.0000	0.0000	5.19	9.01	3.82	48.82	10:30
3	TOC	0.0000	0.0000	5.21	9.02	3.81	48.82	10:24
4	TOC	0.0000	0.0000	5.15	8.83	3.67	48.80	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.3847 (IC) (v1359)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 3

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	26.5036 ppm (PASS)	0.0000 ppm	0%	2020/03/03 12:22

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	26.5036	265.0364	177.78	181.56	3.78	48.80	10:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)	50 ppmC

Sample Type: Check Standard --> CCB From Schedule Version 3

	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%	2020/03/03 12:37

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	9.30	3.89	48.80	10:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos D

Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)	0 ppmC

Sample Type: Sample From Schedule Version 3

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	20	TOC	MB2	0.0000 ppm	0.0000 ppm	0.0000%	2020/03/03 12:51

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	4.81	8.64	3.83	48.76	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.3847 (IC) (v1359)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

Sample Type: Check Standard --> LCS From Schedule Version 3

	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)	26.2134 ppm (PASS)	0.0000 ppm	0%	2020/03/03 13:06

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	26.2134	262.1342	175.94	179.77	3.82	48.76	10:33

Completion State	Success Action	Method	Calibration	STD Conc - Pos C
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)	25 ppmC

Sample Type: Sample From Schedule Version 3

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	21	TOC	K2001717-001.01	1.2611 ppm	0.0554 ppm	4.3900%	2020/03/03 13:21

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.3003	13.0026	17.61	21.41	3.80	48.73	10:30
2	TOC	1.2220	12.2197	17.11	20.78	3.67	48.71	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.3847 (IC) (v1359)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	22	TOC	K2001717-001.01 ms	29.2583 ppm	0.0000 ppm	0.0000%	2020/03/03 13:49

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time

1	TOC	29.2583	292.5832	194.38	198.27	3.89	48.70	10:34

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.3847 (IC) (v1359)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	23	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2020/03/03 14:04

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	5.79	9.72	3.94	48.69	10:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.3847 (IC) (v1359)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	24	TOC	K2001698-001.02	95.3865 ppm	1.9674 ppm	2.0600%	2020/03/03 14:18

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	93.9953	939.9533	603.70	607.53	3.83	48.68	10:27
2	TOC	96.7776	967.7763	621.29	625.32	4.03	48.69	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.3847 (IC) (v1359)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	25	TOC	K2001698-002.02	36.5161 ppm	0.3018 ppm	0.8300%	2020/03/03 14:46

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	36.7295	367.2950	241.62	245.61	3.99	48.69	10:28
2	TOC	36.3026	363.0263	238.92	242.74	3.82	48.68	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.3847 (IC) (v1359)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	26	TOC	K2001700-001.01	11.1118 ppm	0.1852 ppm	1.6700%	2020/03/03 15:14

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	11.2428	112.4280	80.47	84.27	3.80	48.67	10:29
2	TOC	10.9809	109.8089	78.82	82.49	3.67	48.66	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.3847 (IC) (v1359)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	27	TOC	K2001700-002.01	3.6204 ppm	0.0582 ppm	1.6100%	2020/03/03 15:42

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.3847 (IC) (v1359)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	28	TOC	K2001700-003.01	0.1601 ppm	0.1176 ppm	73.4800%	2020/03/03 16:10

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.2433	2.4329	10.92	14.65	3.72	48.70	10:29
2	TOC	0.0769	0.7691	9.87	13.67	3.80	48.69	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.3847 (IC) (v1359)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 3

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	26.9224 ppm (PASS)	0.0000 ppm	0%	2020/03/03 16:38

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	26.9224	269.2244	180.43	184.41	3.98	48.73	10:32

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)	50 ppmC

Sample Type: Check Standard --> CCB From Schedule Version 3

	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%	2020/03/03 16:53

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	6.66	10.56	3.90	48.72	10:38

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)	0 ppmC

Sample Type: Sample From Schedule Version 3

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	29	TOC	K2001700-004.01	3.1633 ppm	0.0208 ppm	0.6600%	2020/03/03 17:08

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.1781	31.7806	29.48	33.35	3.87	48.73	10:28
2	TOC	3.1486	31.4864	29.29	33.23	3.93	48.74	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.3847 (IC) (v1359)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	30	TOC	K2001700-005.01	62.6138 ppm	0.4015 ppm	0.6400%	2020/03/03 17:36

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	62.8977	628.9770	407.08	410.92	3.84	48.75	10:29
2	TOC	62.3299	623.2991	403.49	407.45	3.96	48.77	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.3847 (IC) (v1359)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	31	TOC	RB	0.2075 ppm	0.2935 ppm	141.4200%	2020/03/03 18:04

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.4151	4.1505	12.01	15.82	3.81	48.77	10:29
2	TOC	0.0000	0.0000	7.40	11.43	4.03	48.78	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.3847 (IC) (v1359)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	32	TOC	K2001559-002.02 10x	4.7562 ppm	0.0759 ppm	1.6000%	2020/03/03 18:32

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.8099	48.0992	39.80	43.67	3.87	48.80	10:29
2	TOC	4.7025	47.0253	39.12	43.05	3.94	48.82	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.3847 (IC) (v1359)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	33	TOC	K2001702-001.04	14.4880 ppm	0.5395 ppm	3.7200%	2020/03/03 19:00

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time

1	TOC	14.8695	148.6950	103.40	107.10	3.70	48.80	10:28
2	TOC	14.1066	141.0655	98.58	102.21	3.63	48.81	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.3847 (IC) (v1359)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	34	TOC	K2001702-002.04	15.1217 ppm	0.4852 ppm	3.2100%	2020/03/03 19:28

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	15.4648	154.6481	107.17	110.92	3.76	48.82	10:27
2	TOC	14.7786	147.7856	102.83	106.65	3.82	48.84	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.3847 (IC) (v1359)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	35	TOC	K2001705-001.01	3.5824 ppm	0.0522 ppm	1.4600%	2020/03/03 19:56

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.6193	36.1931	32.27	36.05	3.78	48.85	10:26
2	TOC	3.5455	35.4545	31.80	35.63	3.82	48.86	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.3847 (IC) (v1359)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	36	TOC	K2001705-002.01	1.6262 ppm	0.0259 ppm	1.6000%	2020/03/03 20:24

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.6446	16.4456	19.78	23.51	3.73	48.85	10:31
2	TOC	1.6079	16.0787	19.55	23.22	3.67	48.86	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.3847 (IC) (v1359)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	37	TOC	K2001705-003.01	1.4605 ppm	0.0230 ppm	1.5800%	2020/03/03 20:53

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.4442	14.4418	18.52	22.38	3.86	48.87	10:28
2	TOC	1.4768	14.7676	18.72	22.49	3.76	48.85	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.3847 (IC) (v1359)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	38	TOC	K2001705-004.01	1.7183 ppm	0.0398 ppm	2.3200%	2020/03/03 21:21

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.7464	17.4642	20.43	24.12	3.70	48.86	10:27
2	TOC	1.6901	16.9011	20.07	23.85	3.78	48.84	10:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.3847 (IC) (v1359)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 3

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	26.3072 ppm (PASS)	0.0000 ppm	0%	2020/03/03 21:49

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	26.3072	263.0721	176.54	180.41	3.87	48.86	10:27

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)	50 ppmC

Sample Type: Check Standard --> CCB From Schedule Version 3

	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%	2020/03/03 22:03

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	5.35	9.18	3.83	48.88	10:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)	0 ppmC

Sample Type: Sample From Schedule Version 3

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	39	TOC	K2001705-005.01	1.5287 ppm	0.0290 ppm	1.8900%	2020/03/03 22:18

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time

1	TOC	1.5082	15.0823	18.92	22.76	3.84	48.85	10:27
2	TOC	1.5492	15.4920	19.18	23.07	3.89	48.86	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.3847 (IC) (v1359)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	40	TOC	K2001597-001.02 5x	12.0481 ppm	0.0069 ppm	0.0600%	2020/03/03 22:46

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	12.0432	120.4323	85.53	89.48	3.95	48.85	10:26
2	TOC	12.0530	120.5304	85.59	89.51	3.92	48.85	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.3847 (IC) (v1359)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 3

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	26.6039 ppm (PASS)	0.0000 ppm	0%	2020/03/03 23:14

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	26.6039	266.0391	178.41	182.38	3.97	48.89	10:34

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)	50 ppmC

Sample Type: Check Standard --> CCB From Schedule Version 3

	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%	2020/03/03 23:29

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	5.66	9.63	3.97	48.87	10:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)	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
v1358	2.5737	1.2210	0.0000	0.0000	0.0000	2020/02/27 19:27	Fusion1 (Fusion1)
v1359	1.0233	1.2130	0.0000	0.0000	0.0000	2020/03/02 19:06	Fusion1 (Fusion1)

Calibrations

Name: CAS_salt_010711 (TOC)

Version: v31

Ver Creation: 2020/01/07 14:30

Comment:

Operator: Fusion1 (Fusion1)

Basic Analysis Type: TOC

Calibration curve formula: TOC: y = 6.323x + 10.200

r^2 value: TOC: r^2 = 0.99991

Basic Analysis Type: TOC

Sample ID	Y Raw Value	X Expected	Message	End Time
DI Water	9.5850	0.0000		2020/01/07 13:02
0.500 ppm	12.6160	0.5000		2020/01/07 13:17
1.0 ppm	15.6440	1.0000		2020/01/07 13:31
5.0 ppm	43.7700	5.0000		2020/01/07 13:45
10 ppm	73.2770	10.0000		2020/01/07 14:00
25 ppm	169.4210	25.0000		2020/01/07 14:14
50 ppm	325.6260	50.0000		2020/01/07 14:28

Methods

Name: CAS_salt_010711 (TOC)

Version: v4

Ver Creation: 2019/02/21 17:57

Comment:

Operator: Fusion1 (Fusion1)

Parameter	Value
SampleVolume	10.0 mL
Dilution	1:10
AcidVolume	0.5 ml
ReagentVolume	2.0 ml
UVReactorPrerinse	Off
UVReactorPrerinseVolume	5.0
NumberOfUVReactorPrerinses	1
ICSpargeTime	1.00 mins

Advanced Parameter	Value
NeedleRinseVolume	5.0 ml
VialPrimeVolume	2.0 ml
ICSamplePrimeVolume	2.0 ml
ICSpargeRinseVolume	12.0 ml
BaselineStabilizeTime	0.70 min
DetectorPressureFlow	150 ml/min
SyringeSpeedWaste	10
SyringeSpeedAcid	7

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

Report History

Report History

Report Version	User Name	System Reason	User Reason	Date
1	Fusion1 (Fusion1)	Schedule completed	Schedule completed	2020/03/03 23:44

ALS Environmental

StarLIMS Run: 672039, 672040

Analysis: DOC/TOC

Method: SM 5310 C, 9060A, 415.1, 9060

CCV: 11-GEN-05-82C 50 ppm LCS: 11-GEN-05-79J 25.0 ppm

ICAL Date: 1/7/2020

ICAL ID: 11-GEN-05-83-K->O/84-A/11-GEN-05-84-C->H

ICS ID: 11-GEN-05-78M

ICS TV: 25.0 ppm ICS % R < 1

Spike ID: 11-GEN-05-82C 0.05 ml of 5000 ppm stock ---> 10.0 ml = 25.0 ppm x dilution factor

Sodium Persulfate: 19-GEN-08-6-L

21 % H3PO4: 19-GEN-08-6-G

Equipment ID: K-TOC-03

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

FILTER ID: 16967789

Analyzed By: BCD	Date Analyzed: 3/4/20
Reviewed By:	Date Reviewed: 03/05/20

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
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March 12, 2020

Marcia Olive
Bhate Environmental Associates, Inc.
445 Union Blvd Ste 129
Lakewood, CO 80228

Work Order: **HS20021120**

Laboratory Results for: **Groundwater Treatment Plant Quarterly Effluent Samples**

Dear Marcia,

ALS Environmental received 3 sample(s) on Feb 26, 2020 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: 12-Mar-20

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Effluent Samples
Work Order: HS20021120

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS20021120-01	LH18/24-SP650_022520	Water		25-Feb-2020 14:00	26-Feb-2020 09:00	☐
HS20021120-02	LH18/24-SP650_022520_BIX	Water		25-Feb-2020 14:00	26-Feb-2020 09:00	☐
HS20021120-03	Trip Blank	Water	CG 111519 -110	25-Feb-2020 00:00	26-Feb-2020 09:00	☐

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 12-Mar-20

Client: Bhate Environmental Associates, Inc. **CASE NARRATIVE**
Project: Groundwater Treatment Plant Quarterly Effluent Samples
Work Order: HS20021120

Work Order Comments

• Analysis of Perchlorate was performed by ALS ALS Houston TX, High Resolution. Laboratory. Final report attached.

GCMS Semivolatiles by Method SW8270SIM

Batch ID: 151088

Sample ID: LCSD-151088

• LCS/LCSD RPD was above the RPD limits for the surrogates. The individual recoveries met acceptance criteria.

GCMS Volatiles by Method SW8260

Batch ID: R357105

Sample ID: LH18/24-SP650_022520 (HS20021120-01MS)

• MS/MSD failed QC and RPD limits for some compounds.

Sample ID: Trip Blank (HS20021120-03)

• Surrogate Toluene_d8 exceeded recovery limits. Sample is ND.

Metals by Method SW7470

Batch ID: 151269

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

Metals by Method SW6020

Batch ID: 151244

Sample ID: LH18/24-SP650_022520 (HS20021120-01MS)

• Barium failed for MS/MSD but passed for PDS.

Sample ID: LH18/24-SP650_022520 (HS20021120-01MSD)

• 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. Sodium

WetChemistry by Method E1664A

Batch ID: R357384

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

WetChemistry by Method SW9056

Batch ID: R357300

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

WetChemistry by Method E410.4

Batch ID: R357130

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 12-Mar-20

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**
Project: Groundwater Treatment Plant Quarterly Effluent Samples WorkOrder:HS20021120
Sample ID: LH18/24-SP650_022520 Lab ID:HS20021120-01
Collection Date: 25-Feb-2020 14:00 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	26-Feb-2020 14:15
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	26-Feb-2020 14:15
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	26-Feb-2020 14:15
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	26-Feb-2020 14:15
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	26-Feb-2020 14:15
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	26-Feb-2020 14:15
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	26-Feb-2020 14:15
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	26-Feb-2020 14:15
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	26-Feb-2020 14:15
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	26-Feb-2020 14:15
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	26-Feb-2020 14:15
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	26-Feb-2020 14:15
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	26-Feb-2020 14:15
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	26-Feb-2020 14:15
1,2-Dichloroethane	**1.2**		**0.20**	**0.50**	**1.0**	**UG/L**	1	26-Feb-2020 14:15
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	26-Feb-2020 14:15
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	26-Feb-2020 14:15
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	26-Feb-2020 14:15
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	26-Feb-2020 14:15
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	26-Feb-2020 14:15
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	26-Feb-2020 14:15
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	26-Feb-2020 14:15
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	26-Feb-2020 14:15
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	26-Feb-2020 14:15
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	26-Feb-2020 14:15
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	26-Feb-2020 14:15
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	26-Feb-2020 14:15
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	26-Feb-2020 14:15
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	26-Feb-2020 14:15
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	26-Feb-2020 14:15
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	26-Feb-2020 14:15
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	26-Feb-2020 14:15
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	26-Feb-2020 14:15
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	26-Feb-2020 14:15
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	26-Feb-2020 14:15
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	26-Feb-2020 14:15
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	26-Feb-2020 14:15
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	26-Feb-2020 14:15
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	26-Feb-2020 14:15

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

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ALS Houston, US Date: 12-Mar-20

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**
Project: Groundwater Treatment Plant Quarterly Effluent Samples WorkOrder:HS20021120
Sample ID: LH18/24-SP650_022520 Lab ID:HS20021120-01
Collection Date: 25-Feb-2020 14:00 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	26-Feb-2020 14:15
cis-1,2-Dichloroethene	**23**		**0.20**	**0.50**	**1.0**	**UG/L**	1	26-Feb-2020 14:15
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	26-Feb-2020 14:15
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	26-Feb-2020 14:15
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	26-Feb-2020 14:15
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	26-Feb-2020 14:15
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	26-Feb-2020 14:15
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	26-Feb-2020 14:15
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	26-Feb-2020 14:15
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	26-Feb-2020 14:15
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	26-Feb-2020 14:15
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	26-Feb-2020 14:15
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	26-Feb-2020 14:15
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	26-Feb-2020 14:15
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	26-Feb-2020 14:15
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	26-Feb-2020 14:15
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	26-Feb-2020 14:15
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	26-Feb-2020 14:15
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	26-Feb-2020 14:15
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	26-Feb-2020 14:15
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	26-Feb-2020 14:15
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	26-Feb-2020 14:15
Trichloroethene	**4.9**		**0.20**	**0.50**	**1.0**	**UG/L**	1	26-Feb-2020 14:15
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	26-Feb-2020 14:15
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	26-Feb-2020 14:15
Surr: 1,2-Dichloroethane-d4	*93.3*			**0**	*81-118*	*%REC*	*1*	*26-Feb-2020 14:15*
Surr: 4-Bromofluorobenzene	*101*			**0**	*85-114*	*%REC*	*1*	*26-Feb-2020 14:15*
Surr: Dibromofluoromethane	*94.6*			**0**	*80-119*	*%REC*	*1*	*26-Feb-2020 14:15*
Surr: Toluene-d8	*109*			**0**	*89-112*	*%REC*	*1*	*26-Feb-2020 14:15*
SEMIVOLATILES SIM		**Method:SW8270SIM**				Prep:SW3510 / 27-Feb-2020		Analyst: LG
1,4-Dioxane	**0.39**		**0.010**	**0.010**	**0.010**	**ug/L**	1	04-Mar-2020 10:39
Surr: 2-Fluorobiphenyl	*122*			**0**	*40-140*	*%REC*	*1*	*04-Mar-2020 10:39*
Surr: 4-Terphenyl-d14	*121*			**0**	*40-140*	*%REC*	*1*	*04-Mar-2020 10:39*
Surr: Nitrobenzene-d5	*123*			**0**	*40-140*	*%REC*	*1*	*04-Mar-2020 10:39*

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

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ALS Houston, US Date: 12-Mar-20

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**
Project: Groundwater Treatment Plant Quarterly Effluent Samples WorkOrder:HS20021120
Sample ID: LH18/24-SP650_022520 Lab ID:HS20021120-01
Collection Date: 25-Feb-2020 14:00 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 03-Mar-2020		Analyst: JHD
Aluminum	**0.175**		**0.00180**	**0.00500**	**0.0100**	**mg/L**	1	04-Mar-2020 16:38
Antimony	**0.000607**	J	**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	04-Mar-2020 16:38
Arsenic	**0.000698**	J	**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	04-Mar-2020 16:38
Barium	**0.197**		**0.00190**	**0.00250**	**0.00500**	**mg/L**	1	04-Mar-2020 16:38
Beryllium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	04-Mar-2020 16:38
Cadmium	**0.000317**	J	**0.000200**	**0.000500**	**0.00200**	**mg/L**	1	04-Mar-2020 16:38
Calcium	**15.8**		**0.0340**	**0.0500**	**0.500**	**mg/L**	1	04-Mar-2020 16:38
Chromium	**0.0159**		**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	04-Mar-2020 16:38
Cobalt	**0.00231**	J	**0.000100**	**0.000500**	**0.00500**	**mg/L**	1	04-Mar-2020 16:38
Iron	**0.716**		**0.0120**	**0.0500**	**0.200**	**mg/L**	1	04-Mar-2020 16:38
Lead	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	04-Mar-2020 16:38
Magnesium	**19.2**		**0.0100**	**0.0500**	**0.200**	**mg/L**	1	04-Mar-2020 16:38
Manganese	**0.149**		**0.000700**	**0.00250**	**0.00500**	**mg/L**	1	04-Mar-2020 16:38
Nickel	**0.0136**		**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	04-Mar-2020 16:38
Potassium	**1.38**		**0.0180**	**0.0500**	**0.200**	**mg/L**	1	04-Mar-2020 16:38
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	04-Mar-2020 16:38
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	04-Mar-2020 16:38
Sodium	**314**		**0.280**	**0**	**4.00**	**mg/L**	20	05-Mar-2020 13:24
Thallium	**0.000428**	J	**0.000200**	**0.000500**	**0.00200**	**mg/L**	1	04-Mar-2020 16:38
Vanadium	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	04-Mar-2020 16:38
Zinc	**0.282**		**0.00200**	**0.00250**	**0.00500**	**mg/L**	1	04-Mar-2020 16:38
MERCURY BY SW7470A		**Method:SW7470**				Prep:SW7470 / 03-Mar-2020		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	03-Mar-2020 16:02
OIL & GREASE (HEM) BY E1664A		**Method:E1664A**						Analyst: KAH
Oil and Grease	1.00	U	0.610	1.00	2.00	mg/L	1	02-Mar-2020 14:00
CHEMICAL OXYGEN DEMAND BY E410.4		**Method:E410.4**						Analyst: TH
Chemical Oxygen Demand	**10.0**	J	**5.00**	**15.0**	**15.0**	**mg/L**	1	27-Feb-2020 12:30
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KVL
Chloride	**386**		**2.00**	**5.00**	**5.00**	**mg/L**	10	28-Feb-2020 19:10
Sulfate	**24.0**		**2.00**	**5.00**	**5.00**	**mg/L**	10	28-Feb-2020 19:10

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

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ALS Houston, US Date: 12-Mar-20

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**
Project: Groundwater Treatment Plant Quarterly Effluent Samples WorkOrder:HS20021120
Sample ID: LH18/24-SP650_022520_BIX Lab ID:HS20021120-02
Collection Date: 25-Feb-2020 14:00 Matrix:Water

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	12-Mar-2020 09:29

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

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ALS Houston, US Date: 12-Mar-20

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**
Project: Groundwater Treatment Plant Quarterly Effluent Samples WorkOrder:HS20021120
Sample ID: Trip Blank Lab ID:HS20021120-03
Collection Date: 25-Feb-2020 00:00 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	26-Feb-2020 13:27
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	26-Feb-2020 13:27
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	26-Feb-2020 13:27
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	26-Feb-2020 13:27
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	26-Feb-2020 13:27
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	26-Feb-2020 13:27
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	26-Feb-2020 13:27
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	26-Feb-2020 13:27
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	26-Feb-2020 13:27
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	26-Feb-2020 13:27
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	26-Feb-2020 13:27
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	26-Feb-2020 13:27
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	26-Feb-2020 13:27
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	26-Feb-2020 13:27
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	26-Feb-2020 13:27
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	26-Feb-2020 13:27
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	26-Feb-2020 13:27
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	26-Feb-2020 13:27
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	26-Feb-2020 13:27
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	26-Feb-2020 13:27
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	26-Feb-2020 13:27
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	26-Feb-2020 13:27
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	26-Feb-2020 13:27
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	26-Feb-2020 13:27
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	26-Feb-2020 13:27
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	26-Feb-2020 13:27
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	26-Feb-2020 13:27
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	26-Feb-2020 13:27
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	26-Feb-2020 13:27
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	26-Feb-2020 13:27
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	26-Feb-2020 13:27
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	26-Feb-2020 13:27
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	26-Feb-2020 13:27
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	26-Feb-2020 13:27
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	26-Feb-2020 13:27
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	26-Feb-2020 13:27
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	26-Feb-2020 13:27
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	26-Feb-2020 13:27
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	26-Feb-2020 13:27

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

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ALS Houston, US Date: 12-Mar-20

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**
Project: Groundwater Treatment Plant Quarterly Effluent Samples WorkOrder:HS20021120
Sample ID: Trip Blank Lab ID:HS20021120-03
Collection Date: 25-Feb-2020 00:00 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	26-Feb-2020 13:27
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	26-Feb-2020 13:27
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	26-Feb-2020 13:27
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	26-Feb-2020 13:27
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	26-Feb-2020 13:27
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	26-Feb-2020 13:27
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	26-Feb-2020 13:27
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	26-Feb-2020 13:27
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	26-Feb-2020 13:27
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	26-Feb-2020 13:27
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	26-Feb-2020 13:27
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	26-Feb-2020 13:27
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	26-Feb-2020 13:27
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	26-Feb-2020 13:27
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	26-Feb-2020 13:27
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	26-Feb-2020 13:27
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	26-Feb-2020 13:27
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	26-Feb-2020 13:27
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	26-Feb-2020 13:27
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	26-Feb-2020 13:27
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	26-Feb-2020 13:27
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	26-Feb-2020 13:27
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	26-Feb-2020 13:27
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	26-Feb-2020 13:27
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	26-Feb-2020 13:27
Surr: 1,2-Dichloroethane-d4	*94.7*			**0**	*81-118*	*%REC*	*1*	*26-Feb-2020 13:27*
Surr: 4-Bromofluorobenzene	*94.2*			**0**	*85-114*	*%REC*	*1*	*26-Feb-2020 13:27*
Surr: Dibromofluoromethane	*94.1*			**0**	*80-119*	*%REC*	*1*	*26-Feb-2020 13:27*
Surr: Toluene-d8	*114*	*S*		**0**	*89-112*	*%REC*	*1*	*26-Feb-2020 13:27*

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

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Weight / Prep Log

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Effluent Samples
WorkOrder: HS20021120

Batch ID: 151088 **Start Date:** 27 Feb 2020 07:33 **End Date:** 27 Feb 2020 13:00
Method: SV AQ SEP FUN EXTRACT-LOWLEV - 3510C **Prep Code:** 3510_B_SIM

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS20021120-01		1000 (mL)	1 (mL)	0.001

Batch ID: 151244 **Start Date:** 03 Mar 2020 09:16 **End Date:** 03 Mar 2020 13:30
Method: WATER - SW3010A **Prep Code:** 3010A

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS20021120-01		10 (mL)	10 (mL)	1

Batch ID: 151269 **Start Date:** 03 Mar 2020 10:30 **End Date:** 03 Mar 2020 12:30
Method: MERCURY PREP BY 7470A- WATER **Prep Code:** HG_WPR

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS20021120-01		10 (mL)	10 (mL)	1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 12-Mar-20

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Effluent Samples
WorkOrder: HS20021120

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: 151088 (0)	**Test Name :** SEMIVOLATILES SIM				**Matrix:** Water	
HS20021120-01	LH18/24-SP650_022520	25 Feb 2020 14:00		27 Feb 2020 07:33	04 Mar 2020 10:39	1
Batch ID: 151244 (0)	**Test Name :** METALS BY ICPMS BY SW6020A				**Matrix:** Water	
HS20021120-01	LH18/24-SP650_022520	25 Feb 2020 14:00		03 Mar 2020 13:30	05 Mar 2020 13:24	20
HS20021120-01	LH18/24-SP650_022520	25 Feb 2020 14:00		03 Mar 2020 13:30	04 Mar 2020 16:38	1
Batch ID: 151269 (0)	**Test Name :** MERCURY BY SW7470A				**Matrix:** Water	
HS20021120-01	LH18/24-SP650_022520	25 Feb 2020 14:00		03 Mar 2020 10:30	03 Mar 2020 16:02	1
Batch ID: R357105 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Water	
HS20021120-01	LH18/24-SP650_022520	25 Feb 2020 14:00			26 Feb 2020 14:15	1
HS20021120-03	Trip Blank	25 Feb 2020 00:00			26 Feb 2020 13:27	1
Batch ID: R357130 (0)	**Test Name :** CHEMICAL OXYGEN DEMAND BY E410.4				**Matrix:** Water	
HS20021120-01	LH18/24-SP650_022520	25 Feb 2020 14:00			27 Feb 2020 12:30	1
Batch ID: R357300 (0)	**Test Name :** ANIONS BY SW9056A				**Matrix:** Water	
HS20021120-01	LH18/24-SP650_022520	25 Feb 2020 14:00			28 Feb 2020 19:10	10
Batch ID: R357384 (0)	**Test Name :** OIL & GREASE (HEM) BY E1664A				**Matrix:** Water	
HS20021120-01	LH18/24-SP650_022520	25 Feb 2020 14:00			02 Mar 2020 14:00	1
Batch ID: R357989 (0)	**Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)				**Matrix:** Water	
HS20021120-02	LH18/24-SP650_022520_BIX	25 Feb 2020 14:00			12 Mar 2020 09:29	1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 12-Mar-20

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Effluent Samples
WorkOrder: HS20021120

QC BATCH REPORT

Batch ID: 151244 (0) **Instrument: ICPMS05** **Method: METALS BY ICPMS BY SW6020A**

MBLK Sample ID: **MBLK-151244** Units: **mg/L** Analysis Date: **04-Mar-2020 16:34**
Client ID: Run ID: **ICPMS05_357567** SeqNo: **5500287** PrepDate: **03-Mar-2020** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.002155	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
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	0.05263	0.200								J
Thallium	0.000500	0.00200								U
Vanadium	0.00100	0.00500								U
Zinc	0.00250	0.00500								U

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 12-Mar-20

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Effluent Samples
WorkOrder: HS20021120

QC BATCH REPORT

Batch ID: 151244 (0) **Instrument: ICPMS05** **Method: METALS BY ICPMS BY SW6020A**

LCS Sample ID: **LCS-151244** Units: **mg/L** Analysis Date: **04-Mar-2020 16:36**
Client ID: Run ID: **ICPMS05_357567** SeqNo: **5500288** PrepDate: **03-Mar-2020** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.09852	0.0100	0.1	0	98.5	84 - 117				
Antimony	0.04798	0.00500	0.05	0	96.0	85 - 117				
Arsenic	0.04744	0.00500	0.05	0	94.9	84 - 116				
Barium	0.04832	0.00500	0.05	0	96.6	86 - 114				
Beryllium	0.05018	0.00200	0.05	0	100	83 - 121				
Cadmium	0.0494	0.00200	0.05	0	98.8	87 - 115				
Calcium	4.926	0.500	5	0	98.5	87 - 118				
Chromium	0.04571	0.00500	0.05	0	91.4	85 - 116				
Cobalt	0.04601	0.00500	0.05	0	92.0	86 - 115				
Iron	4.773	0.200	5	0	95.5	87 - 118				
Lead	0.04648	0.00500	0.05	0	93.0	88 - 115				
Magnesium	4.935	0.200	5	0	98.7	83 - 118				
Manganese	0.04603	0.00500	0.05	0	92.1	87 - 115				
Nickel	0.04769	0.00500	0.05	0	95.4	85 - 117				
Potassium	4.873	0.200	5	0	97.5	87 - 115				
Selenium	0.04755	0.00500	0.05	0	95.1	80 - 120				
Silver	0.04605	0.00500	0.05	0	92.1	85 - 116				
Sodium	4.782	0.200	5	0	95.6	85 - 117				
Thallium	0.04389	0.00200	0.05	0	87.8	82 - 116				
Vanadium	0.04599	0.00500	0.05	0	92.0	86 - 115				
Zinc	0.04863	0.00500	0.05	0	97.3	83 - 119				

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 12-Mar-20

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Effluent Samples
WorkOrder: HS20021120

QC BATCH REPORT

Batch ID: 151244 (0) **Instrument: ICPMS05** **Method: METALS BY ICPMS BY SW6020A**

MS Sample ID: **HS20021120-01MS** Units: **mg/L** Analysis Date: **04-Mar-2020 16:46**
Client ID: **LH18/24-SP650_022520** Run ID: **ICPMS05_357567** SeqNo: **5500291** PrepDate: **03-Mar-2020** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.2812	0.0100	0.1	0.1755	106	84 - 117				
Antimony	0.05112	0.00500	0.05	0.000607	101	85 - 117				
Arsenic	0.05267	0.00500	0.05	0.000698	104	84 - 116				
Barium	0.2545	0.00500	0.05	0.197	115	86 - 114				S
Beryllium	0.05764	0.00200	0.05	0.000087	115	83 - 121				
Cadmium	0.05143	0.00200	0.05	0.000317	102	87 - 115				
Calcium	21.39	0.500	5	15.76	113	87 - 118				
Chromium	0.06411	0.00500	0.05	0.01587	96.5	85 - 116				
Cobalt	0.04965	0.00500	0.05	0.002312	94.7	86 - 115				
Iron	5.666	0.200	5	0.7162	99.0	87 - 118				
Lead	0.04845	0.00500	0.05	0.000426	96.0	88 - 115				
Magnesium	24.63	0.200	5	19.24	108	83 - 118				
Manganese	0.1968	0.00500	0.05	0.1485	96.5	87 - 115				
Nickel	0.06229	0.00500	0.05	0.01357	97.4	85 - 117				
Potassium	6.686	0.200	5	1.379	106	87 - 115				
Selenium	0.05163	0.00500	0.05	0.000262	103	80 - 120				
Silver	0.04615	0.00500	0.05	0.000028	92.2	85 - 116				
Sodium	312.6	0.200	5	299.9	253	85 - 117				SEO
Thallium	0.04591	0.00200	0.05	0.000428	91.0	82 - 116				
Vanadium	0.04991	0.00500	0.05	0.000265	99.3	86 - 115				
Zinc	0.3332	0.00500	0.05	0.2817	103	83 - 119				O

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 12-Mar-20

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Effluent Samples
WorkOrder: HS20021120

QC BATCH REPORT

Batch ID: 151244 (0) **Instrument: ICPMS05** **Method: METALS BY ICPMS BY SW6020A**

MSD Sample ID: **HS20021120-01MSD** Units: **mg/L** Analysis Date: **04-Mar-2020 16:48**
Client ID: **LH18/24-SP650_022520** Run ID: **ICPMS05_357567** SeqNo: **5500292** PrepDate: **03-Mar-2020** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.2799	0.0100	0.1	0.1755	104	84 - 117	0.2812	0.459	20	
Antimony	0.05076	0.00500	0.05	0.000607	100	85 - 117	0.05112	0.699	20	
Arsenic	0.05195	0.00500	0.05	0.000698	103	84 - 116	0.05267	1.37	20	
Barium	0.2399	0.00500	0.05	0.197	85.9	86 - 114	0.2545	5.91	20	S
Beryllium	0.05445	0.00200	0.05	0.000087	109	83 - 121	0.05764	5.69	20	
Cadmium	0.04956	0.00200	0.05	0.000317	98.5	87 - 115	0.05143	3.7	20	
Calcium	21.3	0.500	5	15.76	111	87 - 118	21.39	0.415	20	
Chromium	0.06672	0.00500	0.05	0.01587	102	85 - 116	0.06411	4	20	
Cobalt	0.04916	0.00500	0.05	0.002312	93.7	86 - 115	0.04965	0.998	20	
Iron	5.686	0.200	5	0.7162	99.4	87 - 118	5.666	0.359	20	
Lead	0.04901	0.00500	0.05	0.000426	97.2	88 - 115	0.04845	1.15	20	
Magnesium	24.28	0.200	5	19.24	101	83 - 118	24.63	1.44	20	
Manganese	0.1979	0.00500	0.05	0.1485	98.7	87 - 115	0.1968	0.566	20	
Nickel	0.0605	0.00500	0.05	0.01357	93.8	85 - 117	0.06229	2.92	20	
Potassium	6.56	0.200	5	1.379	104	87 - 115	6.686	1.9	20	
Selenium	0.05244	0.00500	0.05	0.000262	104	80 - 120	0.05163	1.55	20	
Silver	0.0443	0.00500	0.05	0.000028	88.6	85 - 116	0.04615	4.09	20	
Sodium	310.1	0.200	5	299.9	203	85 - 117	312.6	0.803	20	SEO
Thallium	0.04672	0.00200	0.05	0.000428	92.6	82 - 116	0.04591	1.76	20	
Vanadium	0.04954	0.00500	0.05	0.000265	98.6	86 - 115	0.04991	0.744	20	
Zinc	0.3374	0.00500	0.05	0.2817	111	83 - 119	0.3332	1.24	20	O

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 12-Mar-20

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Effluent Samples
WorkOrder: HS20021120

QC BATCH REPORT

Batch ID: 151244 (0) **Instrument: ICPMS05** **Method: METALS BY ICPMS BY SW6020A**

PDS Sample ID: **HS20021120-01PDS** Units: **mg/L** Analysis Date: **04-Mar-2020 16:51**
Client ID: **LH18/24-SP650_022520** Run ID: **ICPMS05_357567** SeqNo: **5500293** PrepDate: **03-Mar-2020** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.2853	0.0100	0.1	0.1755	110	80 - 120				
Antimony	0.09716	0.00500	0.1	0.000607	96.6	80 - 120				
Arsenic	0.1126	0.00500	0.1	0.000698	112	80 - 120				
Barium	0.3043	0.00500	0.1	0.197	107	80 - 120				
Beryllium	0.111	0.00200	0.1	0.000087	111	80 - 120				
Cadmium	0.1107	0.00200	0.1	0.000317	110	80 - 120				
Calcium	26.74	0.500	10	15.76	110	80 - 120				
Chromium	0.1205	0.00500	0.1	0.01587	105	80 - 120				
Cobalt	0.107	0.00500	0.1	0.002312	105	80 - 120				
Iron	11.69	0.200	10	0.7162	110	80 - 120				
Lead	0.1051	0.00500	0.1	0.000426	105	80 - 120				
Magnesium	29.89	0.200	10	19.24	107	80 - 120				
Manganese	0.252	0.00500	0.1	0.1485	104	80 - 120				
Nickel	0.1188	0.00500	0.1	0.01357	105	80 - 120				
Potassium	12.72	0.200	10	1.379	113	80 - 120				
Selenium	0.111	0.00500	0.1	0.000262	111	80 - 120				
Silver	0.09132	0.00500	0.1	0.000028	91.3	80 - 120				
Thallium	0.1106	0.00200	0.1	0.000428	110	80 - 120				
Vanadium	0.1093	0.00500	0.1	0.000265	109	80 - 120				
Zinc	0.3889	0.00500	0.1	0.2817	107	80 - 120				

PDS Sample ID: **HS20021120-01PDS** Units: **mg/L** Analysis Date: **05-Mar-2020 13:28**
Client ID: **LH18/24-SP650_022520** Run ID: **ICPMS06_357609** SeqNo: **5501056** PrepDate: **03-Mar-2020** DF: **20**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sodium	498.7	4.00	200	314	92.4	80 - 120				

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 12-Mar-20

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Effluent Samples
WorkOrder: HS20021120

QC BATCH REPORT

Batch ID: 151244 (0) **Instrument: ICPMS05** **Method: METALS BY ICPMS BY SW6020A**

SD Sample ID: **HS20021120-01SD** Units: **mg/L** Analysis Date: **04-Mar-2020 16:41**
Client ID: **LH18/24-SP650_022520** Run ID: **ICPMS05_357567** SeqNo: **5500290** PrepDate: **03-Mar-2020** 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					0.000607	0	10	U
Arsenic	0.00250	0.0250					0.000698	0	10	U
Barium	0.1916	0.0250					0.197	2.72	10	
Beryllium	0.00250	0.0100					0.000087	0	10	U
Cadmium	0.00250	0.0100					0.000317	0	10	U
Calcium	15.73	2.50					15.76	0.157	10	
Chromium	0.01606	0.0250					0.01587	0	10	J
Cobalt	0.002648	0.0250					0.002312	0	10	J
Iron	0.7028	1.00					0.7162	0	10	J
Lead	0.00500	0.0250					0.000426	0	10	U
Magnesium	19.97	1.00					19.24	3.79	10	
Manganese	0.1512	0.0250					0.1485	1.8	10	
Nickel	0.01453	0.0250					0.01357	0	10	J
Potassium	1.41	1.00					1.379	2.26	10	
Selenium	0.0125	0.0250					0.000262	0	10	U
Silver	0.00250	0.0250					0.000028	0	10	U
Thallium	0.00250	0.0100					0.000428	0	10	U
Vanadium	0.00500	0.0250					0.000265	0	10	U
Zinc	0.2931	0.0250					0.2817	4.06	10	

SD Sample ID: **HS20021120-01SD** Units: **mg/L** Analysis Date: **05-Mar-2020 13:26**
Client ID: **LH18/24-SP650_022520** Run ID: **ICPMS06_357609** SeqNo: **5501055** PrepDate: **03-Mar-2020** DF: **100**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Sodium	320.9	20.0					314	2.21	10	

The following samples were analyzed in this batch: HS20021120-01

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 12-Mar-20

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Effluent Samples
WorkOrder: HS20021120

QC BATCH REPORT

Batch ID: 151269 (0) **Instrument: HG03** **Method: MERCURY BY SW7470A**

MBLK Sample ID: **MBLK-151269** Units: **mg/L** Analysis Date: **03-Mar-2020 15:47**
Client ID: Run ID: **HG03_357455** SeqNo: **5498432** PrepDate: **03-Mar-2020** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.000100	0.000200								U

LCS Sample ID: **LCS-151269** Units: **mg/L** Analysis Date: **03-Mar-2020 15:49**
Client ID: Run ID: **HG03_357455** SeqNo: **5498433** PrepDate: **03-Mar-2020** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00507	0.000200	0.005	0	101	80 - 120				

MS Sample ID: **HS20021310-04MS** Units: **mg/L** Analysis Date: **03-Mar-2020 15:52**
Client ID: Run ID: **HG03_357455** SeqNo: **5498435** PrepDate: **03-Mar-2020** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00504	0.000200	0.005	0.00002100	100	75 - 125				

MSD Sample ID: **HS20021310-04MSD** Units: **mg/L** Analysis Date: **03-Mar-2020 15:54**
Client ID: Run ID: **HG03_357455** SeqNo: **5498436** PrepDate: **03-Mar-2020** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00502	0.000200	0.005	0.00002100	100.0	75 - 125	0.005040	0.398	20	

The following samples were analyzed in this batch: HS20021120-01

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 12-Mar-20

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Effluent Samples
WorkOrder: HS20021120

QC BATCH REPORT

Batch ID: 151088 (0) **Instrument: SV-6** **Method: SEMIVOLATILES SIM**

MBLK Sample ID: **MBLK-151088** Units: **ug/L** Analysis Date: **04-Mar-2020 08:42**
Client ID: Run ID: **SV-6_357520** SeqNo: **5499122** PrepDate: **27-Feb-2020** 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	*0.09136*	*0*	*0.08*	*0*	*114*	*40 - 140*				
Surr: 4-Terphenyl-d14	*0.0905*	*0*	*0.08*	*0*	*113*	*40 - 140*				
Surr: Nitrobenzene-d5	*0.1007*	*0*	*0.08*	*0*	*126*	*40 - 140*				

LCS Sample ID: **LCS-151088** Units: **ug/L** Analysis Date: **04-Mar-2020 09:01**
Client ID: Run ID: **SV-6_357520** SeqNo: **5499123** PrepDate: **27-Feb-2020** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,4-Dioxane	0.08192	0.010	0.08	0	102	40 - 140				
Surr: 2-Fluorobiphenyl	*0.07618*	*0*	*0.08*	*0*	*95.2*	*40 - 140*				
Surr: 4-Terphenyl-d14	*0.07633*	*0*	*0.08*	*0*	*95.4*	*40 - 140*				
Surr: Nitrobenzene-d5	*0.08266*	*0*	*0.08*	*0*	*103*	*40 - 140*				

LCSD Sample ID: **LCSD-151088** Units: **ug/L** Analysis Date: **04-Mar-2020 09:42**
Client ID: Run ID: **SV-6_357520** SeqNo: **5499124** PrepDate: **27-Feb-2020** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,4-Dioxane	0.08911	0.010	0.08	0	111	40 - 140	0.08192	8.41	20	
Surr: 2-Fluorobiphenyl	*0.09498*	*0*	*0.08*	*0*	*119*	*40 - 140*	*0.07618*	*22*	*20*	R
Surr: 4-Terphenyl-d14	*0.09753*	*0*	*0.08*	*0*	*122*	*40 - 140*	*0.07633*	*24.4*	*20*	R
Surr: Nitrobenzene-d5	*0.09804*	*0*	*0.08*	*0*	*123*	*40 - 140*	*0.08266*	*17*	*20*	

The following samples were analyzed in this batch: HS20021120-01

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 12-Mar-20

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Effluent Samples
WorkOrder: HS20021120

QC BATCH REPORT

Batch ID: R357105 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-200226** Units: **UG/L** Analysis Date: **26-Feb-2020 13:03**
Client ID: Run ID: **VOA6_357105** SeqNo: **5489751** 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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 12-Mar-20

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Effluent Samples
WorkOrder: HS20021120

QC BATCH REPORT

Batch ID: R357105 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-200226** Units: **UG/L** Analysis Date: **26-Feb-2020 13:03**
Client ID: Run ID: **VOA6_357105** SeqNo: **5489751** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	1.0	2.0								U
Carbon tetrachloride	0.50	1.0								U
Chlorobenzene	0.50	1.0								U
Chloroethane	0.50	1.0								U
Chloroform	0.50	1.0								U
Chloromethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
cis-1,3-Dichloropropene	0.50	1.0								U
Dibromochloromethane	0.50	1.0								U
Dibromomethane	0.50	1.0								U
Dichlorodifluoromethane	0.50	1.0								U
Ethylbenzene	0.50	1.0								U
Hexachlorobutadiene	1.0	1.0								U
Isopropylbenzene	0.50	1.0								U
m,p-Xylene	1.0	2.0								U
Methylene chloride	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	*47.31*	*1.0*	*50*	*0*	*94.6*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*51.87*	*1.0*	*50*	*0*	*104*	*85 - 114*				
Surr: Dibromofluoromethane	*46.68*	*1.0*	*50*	*0*	*93.4*	*80 - 119*				
Surr: Toluene-d8	*54.99*	*1.0*	*50*	*0*	*110*	*89 - 112*				

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 12-Mar-20

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Effluent Samples
WorkOrder: HS20021120

QC BATCH REPORT

Batch ID: R357105 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

LCS Sample ID: **VLCSW-200226** Units: **UG/L** Analysis Date: **26-Feb-2020 12:15**
Client ID: Run ID: **VOA6_357105** SeqNo: **5489750** 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	21.39	1.0	20	0	107	74 - 131				
1,1,2,2-Tetrachloroethane	17.82	1.0	20	0	89.1	71 - 121				
1,1,2-Trichloroethane	19.64	1.0	20	0	98.2	80 - 119				
1,1-Dichloroethane	18.56	1.0	20	0	92.8	77 - 125				
1,1-Dichloroethene	17.09	1.0	20	0	85.5	71 - 131				
1,1-Dichloropropene	19.6	1.0	20	0	98.0	78 - 125				
1,2,3-Trichlorobenzene	17.74	1.0	20	0	88.7	69 - 129				
1,2,3-Trichloropropane	18	1.0	20	0	90.0	73 - 122				
1,2,4-Trichlorobenzene	16.31	1.0	20	0	81.6	69 - 130				
1,2,4-Trimethylbenzene	20	1.0	20	0	100	76 - 124				
1,2-Dibromo-3-chloropropane	18.25	1.0	20	0	91.2	62 - 128				
1,2-Dibromoethane	20.35	1.0	20	0	102	77 - 121				
1,2-Dichlorobenzene	19.21	1.0	20	0	96.0	80 - 119				
1,2-Dichloroethane	21.23	1.0	20	0	106	73 - 128				
1,2-Dichloropropane	18.17	1.0	20	0	90.8	78 - 122				
1,3,5-Trimethylbenzene	19.19	1.0	20	0	96.0	75 - 124				
1,3-Dichlorobenzene	19.59	1.0	20	0	97.9	80 - 119				
1,3-Dichloropropane	19.5	1.0	20	0	97.5	80 - 119				
1,4-Dichlorobenzene	19.32	1.0	20	0	96.6	79 - 118				
2,2-Dichloropropane	21.17	1.0	20	0	106	60 - 139				
2-Butanone	38.42	2.0	40	0	96.0	56 - 143				
2-Chlorotoluene	19.19	1.0	20	0	96.0	79 - 122				
2-Hexanone	39.67	2.0	40	0	99.2	57 - 139				
4-Chlorotoluene	18.24	1.0	20	0	91.2	78 - 122				
4-Isopropyltoluene	19.32	1.0	20	0	96.6	77 - 127				
4-Methyl-2-pentanone	39.09	2.0	40	0	97.7	67 - 130				
Acetone	48.28	2.0	40	0	121	39 - 160				
Benzene	18.96	1.0	20	0	94.8	79 - 120				
Bromobenzene	19.63	1.0	20	0	98.2	80 - 120				
Bromochloromethane	19.51	1.0	20	0	97.6	78 - 123				
Bromodichloromethane	20.76	1.0	20	0	104	79 - 125				
Bromoform	22.06	1.0	20	0	110	66 - 130				
Bromomethane	20.59	1.0	20	0	103	53 - 141				

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 12-Mar-20

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Effluent Samples
WorkOrder: HS20021120

QC BATCH REPORT

Batch ID: R357105 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

LCS Sample ID: **VLCSW-200226** Units: **UG/L** Analysis Date: **26-Feb-2020 12:15**
Client ID: Run ID: **VOA6_357105** SeqNo: **5489750** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	35.85	2.0	40	0	89.6	64 - 133				
Carbon tetrachloride	20.92	1.0	20	0	105	72 - 136				
Chlorobenzene	19.76	1.0	20	0	98.8	82 - 118				
Chloroethane	17.78	1.0	20	0	88.9	60 - 138				
Chloroform	18.88	1.0	20	0	94.4	79 - 124				
Chloromethane	16.84	1.0	20	0	84.2	50 - 139				
cis-1,2-Dichloroethene	18.75	1.0	20	0	93.7	78 - 123				
cis-1,3-Dichloropropene	19.83	1.0	20	0	99.2	75 - 124				
Dibromochloromethane	21.45	1.0	20	0	107	74 - 126				
Dibromomethane	20.1	1.0	20	0	100	79 - 123				
Dichlorodifluoromethane	18.57	1.0	20	0	92.9	32 - 152				
Ethylbenzene	19.99	1.0	20	0	100.0	79 - 121				
Hexachlorobutadiene	19	1.0	20	0	95.0	66 - 134				
Isopropylbenzene	21.07	1.0	20	0	105	72 - 131				
m,p-Xylene	40.3	2.0	40	0	101	80 - 121				
Methylene chloride	18.12	2.0	20	0	90.6	74 - 124				
Naphthalene	16.38	1.0	20	0	81.9	61 - 128				
n-Butylbenzene	18.54	1.0	20	0	92.7	75 - 128				
n-Propylbenzene	19.7	1.0	20	0	98.5	76 - 126				
o-Xylene	20.39	1.0	20	0	102	78 - 122				
sec-Butylbenzene	19.69	1.0	20	0	98.4	77 - 126				
Styrene	20.67	1.0	20	0	103	78 - 123				
tert-Butylbenzene	20.31	1.0	20	0	102	78 - 124				
Tetrachloroethene	21.9	1.0	20	0	109	74 - 129				
Toluene	20.07	1.0	20	0	100	80 - 121				
trans-1,2-Dichloroethene	19.17	1.0	20	0	95.8	75 - 124				
trans-1,3-Dichloropropene	20.15	1.0	20	0	101	73 - 127				
Trichloroethene	20.43	1.0	20	0	102	79 - 123				
Trichlorofluoromethane	21.66	1.0	20	0	108	65 - 141				
Vinyl chloride	16.89	1.0	20	0	84.4	58 - 137				
Surr: 1,2-Dichloroethane-d4	*51.11*	*1.0*	*50*	*0*	*102*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*45.89*	*1.0*	*50*	*0*	*91.8*	*85 - 114*				
Surr: Dibromofluoromethane	*47.6*	*1.0*	*50*	*0*	*95.2*	*80 - 119*				
Surr: Toluene-d8	*47.84*	*1.0*	*50*	*0*	*95.7*	*89 - 112*				

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 12-Mar-20

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Effluent Samples
WorkOrder: HS20021120

QC BATCH REPORT

Batch ID: R357105 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MS Sample ID: **HS20021120-01MS** Units: **UG/L** Analysis Date: **26-Feb-2020 16:40**
Client ID: **LH18/24-SP650_022520** Run ID: **VOA6_357105** SeqNo: **5489757** 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	22.59	1.0	20	0	113	78 - 124				
1,1,1-Trichloroethane	20.42	1.0	20	0	102	74 - 131				
1,1,2,2-Tetrachloroethane	18.09	1.0	20	0	90.4	71 - 121				
1,1,2-Trichloroethane	20.18	1.0	20	0	101	80 - 119				
1,1-Dichloroethane	17.45	1.0	20	0	87.2	77 - 125				
1,1-Dichloroethene	17.95	1.0	20	0	89.7	71 - 131				
1,1-Dichloropropene	20.07	1.0	20	0	100	78 - 125				
1,2,3-Trichlorobenzene	11.56	1.0	20	0	57.8	69 - 129				S
1,2,3-Trichloropropane	20.23	1.0	20	0	101	73 - 122				
1,2,4-Trichlorobenzene	11.94	1.0	20	0	59.7	69 - 130				S
1,2,4-Trimethylbenzene	21.87	1.0	20	0	109	76 - 124				
1,2-Dibromo-3-chloropropane	12.73	1.0	20	0	63.6	62 - 128				
1,2-Dibromoethane	19.36	1.0	20	0	96.8	77 - 121				
1,2-Dichlorobenzene	19.11	1.0	20	0	95.5	80 - 119				
1,2-Dichloroethane	21.31	1.0	20	1.194	101	73 - 128				
1,2-Dichloropropane	17.69	1.0	20	0	88.4	78 - 122				
1,3,5-Trimethylbenzene	25.22	1.0	20	0	126	75 - 124				S
1,3-Dichlorobenzene	19.92	1.0	20	0	99.6	80 - 119				
1,3-Dichloropropane	19.95	1.0	20	0	99.8	80 - 119				
1,4-Dichlorobenzene	20.76	1.0	20	0	104	79 - 118				
2,2-Dichloropropane	19.09	1.0	20	0	95.4	60 - 139				
2-Butanone	27.96	2.0	40	0	69.9	56 - 143				
2-Chlorotoluene	24.55	1.0	20	0	123	79 - 122				S
2-Hexanone	35.6	2.0	40	0	89.0	57 - 139				
4-Chlorotoluene	24.22	1.0	20	0	121	78 - 122				
4-Isopropyltoluene	21.06	1.0	20	0	105	77 - 127				
4-Methyl-2-pentanone	38.1	2.0	40	0	95.3	67 - 130				
Acetone	28.06	2.0	40	0	70.2	39 - 160				
Benzene	18.72	1.0	20	0	93.6	79 - 120				
Bromobenzene	24.53	1.0	20	0	123	80 - 120				S
Bromochloromethane	17.72	1.0	20	0	88.6	78 - 123				
Bromodichloromethane	19.99	1.0	20	0	100.0	79 - 125				
Bromoform	20.41	1.0	20	0	102	66 - 130				
Bromomethane	17.29	1.0	20	0	86.5	53 - 141				

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 12-Mar-20

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Effluent Samples
WorkOrder: HS20021120

QC BATCH REPORT

Batch ID: R357105 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS20021120-01MS** Units: **UG/L** Analysis Date: **26-Feb-2020 16:40**
Client ID: **LH18/24-SP650_022520** Run ID: **VOA6_357105** SeqNo: **5489757** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	35.28	2.0	40	0	88.2	64 - 133				
Carbon tetrachloride	21.2	1.0	20	0	106	72 - 136				
Chlorobenzene	20.93	1.0	20	0	105	82 - 118				
Chloroethane	21.06	1.0	20	0	105	60 - 138				
Chloroform	17.53	1.0	20	0	87.7	79 - 124				
Chloromethane	16.33	1.0	20	0	81.6	50 - 139				
cis-1,2-Dichloroethene	40.57	1.0	20	22.73	89.2	78 - 123				
cis-1,3-Dichloropropene	18.8	1.0	20	0	94.0	75 - 124				
Dibromochloromethane	21.22	1.0	20	0	106	74 - 126				
Dibromomethane	18.63	1.0	20	0	93.2	79 - 123				
Dichlorodifluoromethane	17.84	1.0	20	0	89.2	32 - 152				
Ethylbenzene	22.1	1.0	20	0	111	79 - 121				
Hexachlorobutadiene	13.17	1.0	20	0	65.8	66 - 134				S
Isopropylbenzene	23.03	1.0	20	0	115	72 - 131				
m,p-Xylene	44.83	2.0	40	0	112	80 - 121				
Methylene chloride	17.68	2.0	20	0	88.4	74 - 124				
Naphthalene	11.59	1.0	20	0	57.9	61 - 128				S
n-Butylbenzene	19.04	1.0	20	0	95.2	75 - 128				
n-Propylbenzene	25.4	1.0	20	0	127	76 - 126				S
o-Xylene	22.51	1.0	20	0	113	78 - 122				
sec-Butylbenzene	21.65	1.0	20	0	108	77 - 126				
Styrene	22	1.0	20	0	110	78 - 123				
tert-Butylbenzene	22.64	1.0	20	0	113	78 - 124				
Tetrachloroethene	24.82	1.0	20	0	124	74 - 129				
Toluene	22.17	1.0	20	0	111	80 - 121				
trans-1,2-Dichloroethene	18.05	1.0	20	0	90.3	75 - 124				
trans-1,3-Dichloropropene	18.71	1.0	20	0	93.5	73 - 127				
Trichloroethene	26.16	1.0	20	4.868	106	79 - 123				
Trichlorofluoromethane	19.59	1.0	20	0	98.0	65 - 141				
Vinyl chloride	16.76	1.0	20	0	83.8	58 - 137				
Surr: 1,2-Dichloroethane-d4	*48.98*	*1.0*	*50*	*0*	*98.0*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*52.71*	*1.0*	*50*	*0*	*105*	*85 - 114*				
Surr: Dibromofluoromethane	*46.76*	*1.0*	*50*	*0*	*93.5*	*80 - 119*				
Surr: Toluene-d8	*57.53*	*1.0*	*50*	*0*	*115*	*89 - 112*				S

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 12-Mar-20

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Effluent Samples
WorkOrder: HS20021120

QC BATCH REPORT

Batch ID: R357105 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MSD Sample ID: **HS20021120-01MSD** Units: **UG/L** Analysis Date: **26-Feb-2020 17:28**
Client ID: **LH18/24-SP650_022520** Run ID: **VOA6_357105** SeqNo: **5489758** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	21.4	1.0	20	0	107	78 - 124	22.59	5.4	20	
1,1,1-Trichloroethane	18.83	1.0	20	0	94.2	74 - 131	20.42	8.07	20	
1,1,2,2-Tetrachloroethane	18.29	1.0	20	0	91.4	71 - 121	18.09	1.11	20	
1,1,2-Trichloroethane	19.6	1.0	20	0	98.0	80 - 119	20.18	2.91	20	
1,1-Dichloroethane	16.3	1.0	20	0	81.5	77 - 125	17.45	6.79	20	
1,1-Dichloroethene	16.05	1.0	20	0	80.3	71 - 131	17.95	11.1	20	
1,1-Dichloropropene	18.4	1.0	20	0	92.0	78 - 125	20.07	8.69	20	
1,2,3-Trichlorobenzene	18.57	1.0	20	0	92.8	69 - 129	11.56	46.6	20	R
1,2,3-Trichloropropane	19.85	1.0	20	0	99.2	73 - 122	20.23	1.92	20	
1,2,4-Trichlorobenzene	16.6	1.0	20	0	83.0	69 - 130	11.94	32.6	20	R
1,2,4-Trimethylbenzene	21.88	1.0	20	0	109	76 - 124	21.87	0.0497	20	
1,2-Dibromo-3-chloropropane	16.1	1.0	20	0	80.5	62 - 128	12.73	23.4	20	R
1,2-Dibromoethane	20.85	1.0	20	0	104	77 - 121	19.36	7.39	20	
1,2-Dichlorobenzene	20.42	1.0	20	0	102	80 - 119	19.11	6.61	20	
1,2-Dichloroethane	21.3	1.0	20	1.194	101	73 - 128	21.31	0.0455	20	
1,2-Dichloropropane	17.11	1.0	20	0	85.5	78 - 122	17.69	3.35	20	
1,3,5-Trimethylbenzene	23.62	1.0	20	0	118	75 - 124	25.22	6.54	20	
1,3-Dichlorobenzene	21.16	1.0	20	0	106	80 - 119	19.92	5.99	20	
1,3-Dichloropropane	19.27	1.0	20	0	96.4	80 - 119	19.95	3.46	20	
1,4-Dichlorobenzene	20.82	1.0	20	0	104	79 - 118	20.76	0.306	20	
2,2-Dichloropropane	17.34	1.0	20	0	86.7	60 - 139	19.09	9.61	20	
2-Butanone	30.5	2.0	40	0	76.3	56 - 143	27.96	8.71	20	
2-Chlorotoluene	22.18	1.0	20	0	111	79 - 122	24.55	10.2	20	
2-Hexanone	37.89	2.0	40	0	94.7	57 - 139	35.6	6.24	20	
4-Chlorotoluene	22.59	1.0	20	0	113	78 - 122	24.22	6.94	20	
4-Isopropyltoluene	20.97	1.0	20	0	105	77 - 127	21.06	0.46	20	
4-Methyl-2-pentanone	37.67	2.0	40	0	94.2	67 - 130	38.1	1.15	20	
Acetone	29.97	2.0	40	0	74.9	39 - 160	28.06	6.58	20	
Benzene	18.05	1.0	20	0	90.2	79 - 120	18.72	3.67	20	
Bromobenzene	21.83	1.0	20	0	109	80 - 120	24.53	11.6	20	
Bromochloromethane	16.66	1.0	20	0	83.3	78 - 123	17.72	6.13	20	
Bromodichloromethane	19.75	1.0	20	0	98.7	79 - 125	19.99	1.24	20	
Bromoform	19.42	1.0	20	0	97.1	66 - 130	20.41	4.99	20	
Bromomethane	17.15	1.0	20	0	85.8	53 - 141	17.29	0.82	20	

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 12-Mar-20

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Effluent Samples
WorkOrder: HS20021120

QC BATCH REPORT

Batch ID: R357105 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MSD Sample ID: **HS20021120-01MSD** Units: **UG/L** Analysis Date: **26-Feb-2020 17:28**
Client ID: **LH18/24-SP650_022520** Run ID: **VOA6_357105** SeqNo: **5489758** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Carbon disulfide	26.85	2.0	40	0	67.1	64 - 133	35.28	27.2	20	R
Carbon tetrachloride	19.96	1.0	20	0	99.8	72 - 136	21.2	6.01	20	
Chlorobenzene	19.36	1.0	20	0	96.8	82 - 118	20.93	7.81	20	
Chloroethane	18.66	1.0	20	0	93.3	60 - 138	21.06	12.1	20	
Chloroform	16.5	1.0	20	0	82.5	79 - 124	17.53	6.07	20	
Chloromethane	13.58	1.0	20	0	67.9	50 - 139	16.33	18.3	20	
cis-1,2-Dichloroethene	38.28	1.0	20	22.73	77.7	78 - 123	40.57	5.82	20	S
cis-1,3-Dichloropropene	18.43	1.0	20	0	92.1	75 - 124	18.8	1.99	20	
Dibromochloromethane	21.46	1.0	20	0	107	74 - 126	21.22	1.13	20	
Dibromomethane	19.28	1.0	20	0	96.4	79 - 123	18.63	3.42	20	
Dichlorodifluoromethane	15.45	1.0	20	0	77.2	32 - 152	17.84	14.4	20	
Ethylbenzene	19.49	1.0	20	0	97.5	79 - 121	22.1	12.5	20	
Hexachlorobutadiene	16.4	1.0	20	0	82.0	66 - 134	13.17	21.9	20	R
Isopropylbenzene	20.24	1.0	20	0	101	72 - 131	23.03	12.9	20	
m,p-Xylene	40.44	2.0	40	0	101	80 - 121	44.83	10.3	20	
Methylene chloride	14.32	2.0	20	0	71.6	74 - 124	17.68	21	20	SR
Naphthalene	18.11	1.0	20	0	90.5	61 - 128	11.59	43.9	20	R
n-Butylbenzene	19.65	1.0	20	0	98.2	75 - 128	19.04	3.15	20	
n-Propylbenzene	23.09	1.0	20	0	115	76 - 126	25.4	9.52	20	
o-Xylene	20.2	1.0	20	0	101	78 - 122	22.51	10.8	20	
sec-Butylbenzene	21.99	1.0	20	0	110	77 - 126	21.65	1.56	20	
Styrene	19.82	1.0	20	0	99.1	78 - 123	22	10.4	20	
tert-Butylbenzene	22.8	1.0	20	0	114	78 - 124	22.64	0.688	20	
Tetrachloroethene	22.22	1.0	20	0	111	74 - 129	24.82	11.1	20	
Toluene	20.06	1.0	20	0	100	80 - 121	22.17	10	20	
trans-1,2-Dichloroethene	14.31	1.0	20	0	71.6	75 - 124	18.05	23.1	20	SR
trans-1,3-Dichloropropene	19.24	1.0	20	0	96.2	73 - 127	18.71	2.84	20	
Trichloroethene	23.8	1.0	20	4.868	94.7	79 - 123	26.16	9.42	20	
Trichlorofluoromethane	18.85	1.0	20	0	94.3	65 - 141	19.59	3.84	20	
Vinyl chloride	14.4	1.0	20	0	72.0	58 - 137	16.76	15.2	20	
Surr: 1,2-Dichloroethane-d4	*46.67*	*1.0*	*50*	*0*	*93.3*	*81 - 118*	*48.98*	*4.83*	*20*	
Surr: 4-Bromofluorobenzene	*48.14*	*1.0*	*50*	*0*	*96.3*	*85 - 114*	*52.71*	*9.05*	*20*	
Surr: Dibromofluoromethane	*47.13*	*1.0*	*50*	*0*	*94.3*	*80 - 119*	*46.76*	*0.787*	*20*	
Surr: Toluene-d8	*55.4*	*1.0*	*50*	*0*	*111*	*89 - 112*	*57.53*	*3.77*	*20*	

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 12-Mar-20

Client:	Bhate Environmental Associates, Inc.
Project:	Groundwater Treatment Plant Quarterly Effluent Samples
WorkOrder:	HS20021120

QC BATCH REPORT

Batch ID:	**R357105 (0)**	**Instrument:**	**VOA6**	**Method:**	**VOLATILES ORGANICS BY METHOD 8260C**

The following samples were analyzed in this batch: HS20021120-01 HS20021120-03

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ALS Houston, US Date: 12-Mar-20

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Effluent Samples
WorkOrder: HS20021120

QC BATCH REPORT

Batch ID: R357130 (0) **Instrument: WetChem_HS** **Method: CHEMICAL OXYGEN DEMAND BY E410.4**

MBLK Sample ID: **MBLK-R357130** Units: **mg/L** Analysis Date: **27-Feb-2020 12:30**
Client ID: Run ID: **WetChem_HS_357130** SeqNo: **5490185** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chemical Oxygen Demand	15.0	15.0								U

LCS Sample ID: **LCS-R357130** Units: **mg/L** Analysis Date: **27-Feb-2020 12:30**
Client ID: Run ID: **WetChem_HS_357130** SeqNo: **5490184** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chemical Oxygen Demand	103	15.0	100	0	103	85 - 115				

LCSD Sample ID: **LCSD-R357130** Units: **mg/L** Analysis Date: **27-Feb-2020 12:30**
Client ID: Run ID: **WetChem_HS_357130** SeqNo: **5490183** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chemical Oxygen Demand	102	15.0	100	0	102	85 - 115	103	0.976	20	

MS Sample ID: **HS20021114-01MS** Units: **mg/L** Analysis Date: **27-Feb-2020 12:30**
Client ID: Run ID: **WetChem_HS_357130** SeqNo: **5490187** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chemical Oxygen Demand	60	15.0	50	11	98.0	80 - 120				

MSD Sample ID: **HS20021114-01MSD** Units: **mg/L** Analysis Date: **27-Feb-2020 12:30**
Client ID: Run ID: **WetChem_HS_357130** SeqNo: **5490186** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chemical Oxygen Demand	58	15.0	50	11	94.0	80 - 120	60	3.39	20	

The following samples were analyzed in this batch: HS20021120-01

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ALS Houston, US Date: 12-Mar-20

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Effluent Samples
WorkOrder: HS20021120

QC BATCH REPORT

Batch ID: R357300 (0) **Instrument: ICS2100** **Method: ANIONS BY SW9056A**

MBLK Sample ID: **WBLKW2-022820** Units: **mg/L** Analysis Date: **28-Feb-2020 11:50**
Client ID: Run ID: **ICS2100_357300** SeqNo: **5493858** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	0.500	0.500								U
Sulfate	0.500	0.500								U

LCS Sample ID: **WLCSW2-022820** Units: **mg/L** Analysis Date: **28-Feb-2020 12:04**
Client ID: Run ID: **ICS2100_357300** SeqNo: **5493859** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	20.12	0.500	20	0	101	80 - 120				
Sulfate	19.9	0.500	20	0	99.5	80 - 120				

LCSD Sample ID: **WLCSDW2-022820** Units: **mg/L** Analysis Date: **28-Feb-2020 12:19**
Client ID: Run ID: **ICS2100_357300** SeqNo: **5493860** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	20.02	0.500	20	0	100	80 - 120	20.12	0.493	20	
Sulfate	19.87	0.500	20	0	99.4	80 - 120	19.9	0.136	20	

MS Sample ID: **HS20021016-01MS** Units: **mg/L** Analysis Date: **28-Feb-2020 17:57**
Client ID: Run ID: **ICS2100_357300** SeqNo: **5493902** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	65.44	0.500	10	56.88	85.6	80 - 120				O
Sulfate	33.7	0.500	10	24.68	90.1	80 - 120				

MS Sample ID: **HS20020939-01MS** Units: **mg/L** Analysis Date: **28-Feb-2020 12:48**
Client ID: Run ID: **ICS2100_357300** SeqNo: **5493862** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	125.7	0.500	10	117.6	81.0	80 - 120				EO
Sulfate	47.93	0.500	10	38.9	90.3	80 - 120				

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ALS Houston, US Date: 12-Mar-20

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Effluent Samples
WorkOrder: HS20021120

QC BATCH REPORT

Batch ID: R357300 (0) **Instrument: ICS2100** **Method: ANIONS BY SW9056A**

MSD Sample ID: **HS20021016-01MSD** Units: **mg/L** Analysis Date: **28-Feb-2020 18:11**
Client ID: Run ID: **ICS2100_357300** SeqNo: **5493903** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	66.45	0.500	10	56.88	95.7	80 - 120	65.44	1.53	20	O
Sulfate	34	0.500	10	24.68	93.2	80 - 120	33.7	0.904	20	

MSD Sample ID: **HS20020939-01MSD** Units: **mg/L** Analysis Date: **28-Feb-2020 13:03**
Client ID: Run ID: **ICS2100_357300** SeqNo: **5493863** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	126.1	0.500	10	117.6	85.2	80 - 120	125.7	0.341	20	EO
Sulfate	48.29	0.500	10	38.9	93.9	80 - 120	47.93	0.74	20	

The following samples were analyzed in this batch: HS20021120-01

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ALS Houston, US Date: 12-Mar-20

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Effluent Samples
WorkOrder: HS20021120

QC BATCH REPORT

Batch ID: R357384 (0) **Instrument: Balance1** **Method: OIL & GREASE (HEM) BY E1664A**

MBLK Sample ID: **WBLKW-030220** Units: **mg/L** Analysis Date: **02-Mar-2020 14:00**
Client ID: Run ID: **Balance1_357384** SeqNo: **5495870** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Oil and Grease	1.00	2.00								U

LCS Sample ID: **WLCSW-030220** Units: **mg/L** Analysis Date: **02-Mar-2020 14:00**
Client ID: Run ID: **Balance1_357384** SeqNo: **5495872** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Oil and Grease	38.4	2.00	40	0	96.0	78 - 114				

LCSD Sample ID: **WLCSDW-030220** Units: **mg/L** Analysis Date: **02-Mar-2020 14:00**
Client ID: Run ID: **Balance1_357384** SeqNo: **5495871** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Oil and Grease	37.6	2.00	40	0	94.0	78 - 114	38.4	2.11	18	

MS Sample ID: **HS20021197-01MS** Units: **mg/L** Analysis Date: **02-Mar-2020 14:00**
Client ID: Run ID: **Balance1_357384** SeqNo: **5495869** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Oil and Grease	37.5	2.00	40	1.25	90.6	78 - 114				

The following samples were analyzed in this batch: HS20021120-01

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ALS Houston, US Date: 12-Mar-20

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Effluent Samples
WorkOrder: **HS20021120**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

Unit Reported	Description
mg/L	Milligrams per Liter

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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 V009	22-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	624-2020	31-Dec-2020
North Dakota	R-193 2019-2020	30-Apr-2020
Oklahoma	2019-067	31-Aug-2020
Texas	T104704231-19-25	30-Apr-2020

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ALS Houston, US Date: 12-Mar-20

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Effluent Samples
Work Order: HS20021120

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS20021120-01	LH18/24-SP650_022520	Login	2/26/2020 12:00:19 PM	JRM	WET303
HS20021120-01	LH18/24-SP650_022520	Login	2/26/2020 12:00:19 PM	JRM	EXT116
HS20021120-01	LH18/24-SP650_022520	Login	2/26/2020 12:00:19 PM	JRM	WET303
HS20021120-01	LH18/24-SP650_022520	Login	2/26/2020 12:00:19 PM	JRM	WET303
HS20021120-01	LH18/24-SP650_022520	Login	2/26/2020 12:00:19 PM	JRM	MET079
HS20021120-01	LH18/24-SP650_022520	Login	2/26/2020 12:00:19 PM	JRM	VOA248
HS20021120-02	LH18/24-SP650_022520_BIX	Login	2/26/2020 12:00:19 PM	JRM	Sub
HS20021120-03	Trip Blank	Login	2/26/2020 12:00:19 PM	JRM	VOA248

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ALS Houston, US Date: 12-Mar-20

Sample Receipt Checklist

Client Name: Bhate Environmental
Work Order: HS20021120
Date/Time Received: **26-Feb-2020 09:00**
Received by: **AC**

Checklist completed by: *Jared R. Makan* eSignature 26-Feb-2020 Date
Reviewed by: *RJ Modashia* eSignature 26-Feb-2020 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):	1.6°C/1.6°C UC/C	IR25
Cooler(s)/Kit(s):	45565	
Date/Time sample(s) sent to storage:	02/26/2020 12:05	

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:

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CHAIN OF CUSTODY

Name Of Lab Shipping To: ALS 10450 Stancliff Rd., Suite 210 Houston, Tx. 77099 ATTN: RJ Modashia

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

Project No. NWO1312.0150.0 16.0001

Job: GROUNDWATER TREATMENT PLANT QUARTERLY EFFLUENT SAMPLES

Prepared By: Scott Beesinger

P. O. Number

Field Sample I.D.	Sample Matrix	Date / Time	MS / MSD	No. OF CONTAINERS	Analyses: ROD Volatiles	Total Metals	Oil & Grease	Chemical Oxygen Demand	Chloride & Sulfate	1, 4 - DIOXANE	PERCHLORATE				Remarks (Preservatives, etc.)	Lab I.D.#
LH18/24-SP650_022520	Water	02/25/20 / 14:00		4	3		1								HCL	
LH18/24-SP650_022520	Water	02/25/20 / 14:00		1		1									HNO3	
LH18/24-SP650_022520	Water	02/25/20 / 14:00		2					1	1					NONE	
LH18/24-SP650_022520	Water	02/25/20 / 14:00		1				1							H2SO4	
LH18/24-SP650_022520_BIX	Water	02/25/20 / 14:00		1							1				NONE	
Trip Blank	Water	02/25/20		2	2										HCL	

Additional Remarks: 24 hour TAT on VOC's. Standard TAT on all other parameters

Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
Scott Beesinger	02/25/20	14:30	AC	2/26/2020	09:00						

For Lab Use Only

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

Remarks: o/c 1.6 IR#25 Cfo.o 45565

HS20021120

Bhate Environmental Associates, Inc.
Groundwater Treatment Plant Quarterly Effluent Sar

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

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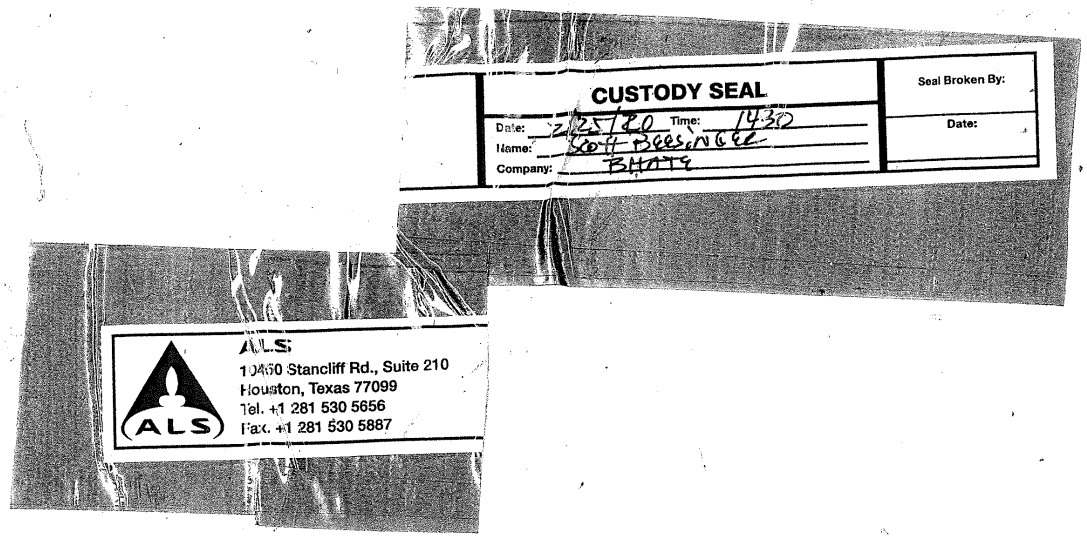

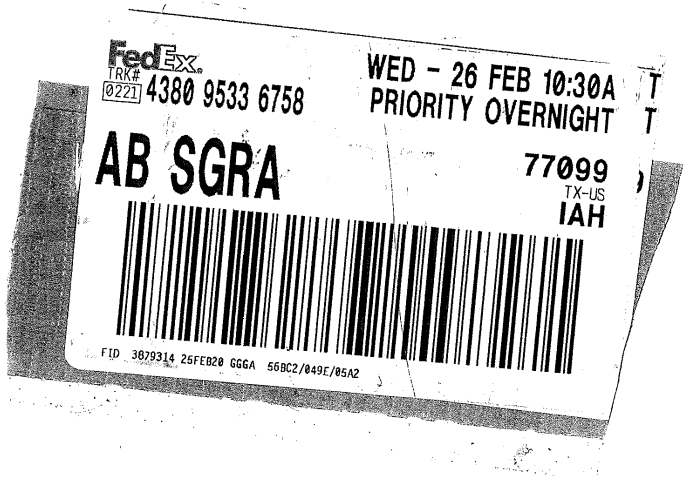

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March 11, 2020 Service Request No:E2000181

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

Laboratory Results for: HS20021120

Dear RJ,

Enclosed are the results of the sample(s) submitted to our laboratory February 26, 2020
For your reference, these analyses have been assigned our service request number **E2000181.**

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current TNI standards, where applicable, and except as noted in the laboratory case narrative provided. All results are intended to be considered in their entirety and ALS Environmental is not responsible for use of less than the complete final report. Results apply only to the items submitted to the laboratory, as received for analysis. In accordance with the current TNI Standard, a statement on the estimated uncertainty of measurement of any quantitative analysis will be supplied upon request.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental



Corey Grandits
Project Manager

ADDRESS 10450 Stancliff Rd., Suite 210, Houston, TX 77099
PHONE +1 281 530 5656 | FAX +1 281 530 5887
ALS Group USA, Corp.
dba ALS Environmental

Certificate of Analysis

ALS Environmental - Houston HRMS
10450 Stancliff Rd, Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

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ALS Environmental

Client:	ALS Houston	**Service Request No.:**	E2000181
Project:	HS20021120	**Date Received:**	02/26/20
Sample Matrix:	W		

CASE NARRATIVE

All analyses were performed in adherence to the quality assurance program of ALS Environmental. This report contains analytical results for samples designated for Tier IV. When appropriate to the method, method blank results have been reported with each analytical test.

Sample Receipt

One sample was received for analysis at ALS Environmental in Houston on 02/26/20.

The sample was received in good condition and is consistent with the accompanying chain of custody form. The sample was stored in a refrigerator at 4°C upon receipt at the laboratory.

Data Validation Notes and Discussion

Precision and Accuracy:

EQ2000089: Laboratory Control Spike/Duplicate Laboratory Control Spike (LCS/DLCS) samples were analyzed and reported in lieu of a MS/MSD for this extraction batch. The LCS and DLCS recoveries are within QC limits.

Certification is held for DoD for the method/matrix/analytes provided in this report.

The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and ALS Environmental (ALS) is not responsible for utilization of less than the complete report.

Use of ALS group USA Corp dba ALS Environmental (ALS)'s Name. Client shall not use ALS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to ALS any test result, tolerance or specification derived from ALS's data ("Attribution") without ALS's prior written consent, which may be withheld by ALS for any reason in its sole discretion. To request ALS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If ALS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use ALS's name or trademark in any Materials or Attribution shall be deemed denied. ALS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of ALS's name or trademark may cause ALS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.

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Client: ALS Environmental - US
Project: HS20021120

Service Request:E2000181

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
E2000181-001	LH18/24-SP650_022520_BIX	2/25/2020	1400

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Service Request Summary

Folder #: **E2000181**
Client Name: ALS Environmental - US
Project Name: HS20021120
Project Number:

Report To: RJ Modashia
ALS Laboratory Group
10450 Stancliff Road
Houston, TX 77099-4338
USA
Phone Number: 281-530-5656
Cell Number:
Fax Number: 281-530-5887
E-mail: rj.modashia@alsglobal.com

Project Chemist: Corey Grandits
Originating Lab: HOUSTON
Logged By: CGRANDITS
Date Received: 02/26/20
Internal Due Date: 3/11/2020
QAP: LAB QAP
Qualifier Set: Lab Standard
Formset: Lab Standard
Merged?: Y
Report to MDL?: Y
P.O. Number: HS20021120
EDD: No EDD Specified

1 250 mL-Plastic Bottle HDPE WM CLEAR Unpreserved
Location: EHRMS-WIC 7B
Pressure Gas:

Lab Samp No.	Client Samp No	Matrix	Collected	HOUSTON ClO4 DOD/6850
E2000181-001	LH18/24-SP650_022520_BIX	Water	02/25/20 1400	**IV**

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Service Request Summary

Folder #: **E2000181**
Client Name: ALS Environmental - US
Project Name: HS20021120
Project Number:

Report To: RJ Modashia
ALS Laboratory Group
10450 Stancliff Road
Houston, TX 77099-4338
USA
Phone Number: 281-530-5656
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Project Chemist: Corey Grandits
Originating Lab: HOUSTON
Logged By: CGRANDITS
Date Received: 02/26/20
Internal Due Date: 3/11/2020
QAP: LAB QAP
Qualifier Set: Lab Standard
Formset: Lab Standard
Merged?: Y
Report to MDL?: Y
P.O. Number: HS20021120
EDD: No EDD Specified

1 250 mL-Plastic Bottle HDPE WM CLEAR Unpreserved
Location: EHRMS-WIC 7B
Pressure Gas:

Print
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Data Qualifiers

Lab Standard

+	Possible Tedlar bag artifact.
A	TIC is a suspected aldol-condensation product
B	Analyte found in the associated method blank as well as in the sample.
BC	Reported results are not blank corrected.
BH	The back section of the tube yielded higher results than the front.
BT	Results indicated possible breakthrough; back section >=10% front section.
C	Result identification confirmed.
D	Compound identified in an analysis at a secondary dilution factor
D	Spike was diluted out
DE	Reported results are corrected for desorption efficiency.
E	Estimated value. Concentration above calibration range
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
H1	Sample analysis performed past holding time. See case narrative.
H2	Initial analysis within holding time. Reanalysis for the required dilution was past holding time.
H3	Sample was received and analyzed past holding time.
H4	Sample was extracted past required extraction holding time, but analyzed within analysis holding time. See case narrative.
I	Internal standard not within the specified limits. See case narrative.
J	Estimated Value. Concentration found below MRL.
K	A deflection in the QC ion may indicate interference with the quantitation of this ion. The concentration of this analyte should be considered as an estimate.
K	Analyte was detected above the method reporting limit prior to normalization.
L1	Laboratory control sample recovery outside the specified limits; results may be biased high.
L2	Laboratory control sample recovery outside the specified limits; results may be biased low.
L3	Laboratory control sample recovery outside the specified limits.
M	Matrix interference; results may be biased high.
M	The duplicate injection precision not met.
M1	Matrix interference due to coelution with a non-target compound; results may be biased high.
N	Presumptive evidence of a compound for TICs that have been identified based on a mass spectral library search.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.
P	Indicates chlorodiphenyl ether interference present at the retention time of the target compound.
P	Pesticide/Aroclor target analyte > 40% difference for detected concentrations between GC columns
Q	Indicates as estimated value because the P and P + 2 theoretical abundance ratio does not meet method criteria.
R	Duplicate Precision not met.
R1	Duplicate precision not within the specified limits; however, the results are below the MRL and considered estimated.
S	Surrogate recovery not within specified limits.

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Data Qualifiers

Lab Standard

S	The reported value was determined by the Method of Standard Additions (MSA).
T	Analyte is a tentatively identified compound, result is estimated.
U	Compound was analyzed for, but was not detected (ND).
V1	The continuing calibration verification standard was outside (biased high) the specified limits for this compound.
V2	The continuing calibration verification standard was outside (biased low) the specified limits for this compound.
W	Result quantified, but the corresponding peak was detected outside the generated retention time window.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
X	See case narrative.
Y	Recovery outside limits
Y	The chromatogram resembles a petroleum product but does not match the calibration standard.
Z	The chromatogram does not resemble a petroleum product.
i	The MRL/MDL has been elevated due to a matrix interference.

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Acronyms

Cal	Calibration
Conc	CONCentration
Dioxin(s)	Polychlorinated dibenzo-p-dioxin(s)
EDL	Estimated Detection Limit
EMPC	Estimated Maximum Possible Concentration
Flags	Data qualifiers
Furan(s)	Polychlorinated dibenzofuran(s)
g	Grams
ICAL	Initial CALibration
ID	IDentifier
Ions	Masses monitored for the analyte during data acquisition
L	Liter (s)
LCS	Laboratory Control Sample
DLCS	Duplicate Laboratory Control Sample
MB	Method Blank
MCL	Method Calibration Limit
MDL	Method Detection Limit
mL	Milliliters
MS	Matrix Spiked sample
DMS	Duplicate Matrix Spiked sample
NO	Number of peaks meeting all identification criteria
PCDD(s)	Polychlorinated dibenzo-p-dioxin(s)
PCDF(s)	Polychlorinated dibenzofuran(s)
ppb	Parts per billion
ppm	Parts per million
ppq	Parts per quadrillion
ppt	Parts per trillion
QA	Quality Assurance
QC	Quality Control
Ratio	Ratio of areas from monitored ions for an analyte
% Rec.	Percent recovery
RPD	Relative Percent Difference
RRF	Relative Response Factor
RT	Retention Time
SDG	Sample Delivery Group
S/N	Signal-to-noise ratio
TEF	Toxicity Equivalence Factor
TEQ	Toxicity Equivalence Quotient

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ALS Environmental

State Certifications, Accreditations, and Licenses

Agency	Number	Expire Date
Arizona Department of Health Services	AZ0793	5/27/2020
Arkansas Department of Environmental Quality	19-028-0	3/27/2020
California Department of Health Services	2919	4/30/2020
Department of Defense	A2LA 2897.01	11/30/2021
Florida Department of Health	E87611	6/30/2020
Hawaii Department of Health	TX02694	4/30/2020
Illinois Environmental Protection Agency	2000322019-2	5/9/2020
Kansas Department of Health and Environment	E-10352	7/31/2020
Louisiana Department of Environmental Quality	03087	6/30/2020
Louisiana Department of Health and Hospitals	LA028-2020	12/31/2020
Maine Center for Disease Control and Prevention	201815	6/5/2020
Maryland Department of the Environment	343	6/30/2020
Minnesota Department of Health	1785988	12/31/2020
Nebraska Department of Health and Human Services	NE-OS-25-13	4/30/2020
Nevada Department of Concervation and Natural Resources	TX026932019-1	7/31/2020
New Hampshire Environmental Laboratory Accreditation Program	209419	4/24/2020
New Jersey Department of Environmental Protection	NLC190001	6/30/2020
New York Department of Health	11707	3/31/2020
Oklahoma Department of Environmental Quality	2019-067	8/31/2020
Pennsylvania Department of Environmental Protection	68-03441-013	6/30/2020
Tennessee Department of Environment and Concervation	04016	6/30/2020
Texas Commision on Environmental Quality	TX104704231-19-25	4/30/2020
United States Department of Agriculture	P330-19-00299	10/10/2022
Utah Department of Health Environmental Laboratory Certification	TX026932019-9	7/31/2020
Washington Department of Health	C819	11/14/2020
West Virginia Department of Environmental Protection	347	6/30/2020

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Chain of Custody

ALS Environmental - Houston HRMS
10450 Stancliff Rd, Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

E2000181 5
ALS Laboratory Group
HS20021120

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: **Colorado** **COC ID:** **13418**

SUBCONTRACT TO:

ALS Environmental
10450 Stancliff RoadSuite 210
Houston, TX 77084

Phone: +1 281 530 5656

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:	HS20021120
TSR:	Danielle Winnings

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS20021120-02**	**LH18/24-SP650_022520_BIX**	**Water**	**25 Feb 2020 14:00**
	SUB_Perch-6850			27 Feb 2020

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. Mussett Date/Time: 2/26/20 15:30

Received By: AUREY G Date/Time: 2/26/20 15:30

Cooler ID(s): Temperature(s):

ALS Environmental

Cooler Receipt Form

Project Chemist: ch

Client/Project: ALS-H

Thermometer ID: SM04

Date/Time Received: 2/26/20 Initials: ch Date/Time Logged in: 2/26/20 Initials: ch

1. Method of delivery: ○ US Mail ○ Fed Ex ○ UPS ○ DHL ☑ Courier (ALS) ○ Client
2. Samples received in: ☑ Cooler ○ Box ○ Envelope ○ Other
3. Were custody seals on coolers? ○ Yes ☑ No
   Were they intact? ○ Yes ○ No ☑ N/A
   Were they signed and dated? ○ Yes ○ No ☑ N/A
   If yes, how many and where?
4. Packing Material: ○ Inserts ☑ Baggies ○ Bubble Wrap ○ Gel Packs ☑ Wet Ice ○ Sleeves ○ Other
5. Foreign or Regulated Soil? ○ Yes ☑ No Location of Sampling:

Cooler Tracking Number	COC ID	Date Opened	Time Opened	Opened By	Temp. °C	Temp Blank?
–		2/26/20	15:30	ch	2.9/3.3	☒
						☐
						☐
						☐

6. Were custody papers properly filled out (ink, signed, dated, etc)? ☑ Yes ○ No
7. Did all bottles arrive in good condition (not broken, no signs of leakage)? ☑ Yes ○ No
8. Were all sample labels complete (i.e., sample ID, analysis, preservation, etc)? ☑ Yes ○ No
9. Were appropriate bottles/containers and volumes received for the requested tests? ☑ Yes ○ No
10. Did sample labels and tags agree with custody documents? ☑ Yes ○ No

Notes, Discrepancies, & Resolutions:

Service request Label: E2000181 5
ALS Laboratory Group
HS20021120

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Effect...

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Houston, TX 77099
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www.alsglobal.com

SAMPLE ACCEPTANCE POLICY

This policy outlines the criteria samples must meet to be accepted by ALS Environmental – Houston HRMS.

Cooler Custody Seals (desirable, mandatory if specified in SAP):

- ✓ Intact on outside of cooler, signed and dated

Chain-of-Custody (COC) documentation (mandatory):

The following is required on each COC:

- ✓ Sample ID, the location, date and time of collection, collector's name, preservation type, sample type, and any other special remarks concerning the sampleThe COC must be completed in ink.
- ✓ Signature and date of relinquishing party.

In the absence of a COC at sample receipt, the COC will be requested from the client.

Sample Integrity (mandatory):

Samples are inspected upon arrival to ensure that sample integrity was not compromised during transfer to the laboratory.

- ✓ Sample containers must arrive in good condition (not broken or leaking).
- ✓ Samples must be labeled appropriately, including Sample IDs, and requested test using durable labels and indelible ink.
- ✓ The correct type of sample bottle must be used for the method requested.
- ✓ An appropriate sample volume, or weight, must be received.
- ✓ Sample IDs and number of containers must reconcile with the COC.
- ✓ Samples must be received within the method defined holding time.

Temperature Requirement (varies by sample matrix):

- ✓ Aqueous and Non-aqueous samples must be shipped and stored cold, at 0 to 6ºC.
- ✓ Tissue samples must be shipped and stored frozen, at -20 to -10ºC.
- ✓ Air samples are shipped and stored cold, at 0 to 6ºC
- ✓ The sample temperature must be recorded on the COC

All cooler inspections are documented on the Cooler Receipt Form (CRF). A separate CRF is completed for each service request. Any samples not meeting the above criteria are noted on the CRF and the Project Manager notified. The Project Manager must resolve any sample integrity issues with the client prior to proceeding with the analysis. Such resolutions are documented in writing and filed with the project folder. Data associated with samples received outside of this acceptance policy will be qualified on the case narrative of the final report

Preparation Information Benchsheets

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Preparation Information Benchsheet

Prep Run#: 355072 **Prep WorkFlow:** GenExt28Day **Status:** Prepped
Team: Semivoa GCMS/KBROWN **Prep Method:** Method **Prep Date/Time:** 3/10/20 10:33

#	Lab Code	Client ID	B#	Method /Test	pH	Cl	Matrix	Amt. Ext.	Sample Description
1	E2000179-001	LH18/24-SP140_022520	.01	6850/ClO4 DOD			Water	10mL	
2	E2000180-001	LH18/24-SP650_022520_BIX	.01	6850/ClO4 DOD			Water	10mL	
3	E2000181-001	LH18/24-SP650_022520_BIX	.01	6850/ClO4 DOD			Water	10mL	
4	E2000182-001	GW-MW-89D-20200226-01	.01	6850/ClO4			Ground Water	10mL	
5	E2000186-001	GW-MW-98D-20200227-01	.01	6850/ClO4			Ground Water	10mL	
6	E2000186-002	GW-MW-6602-20200227-01	.01	6850/ClO4			Ground Water	10mL	
7	E2000186-003	GW-MW-29D-20200227-01	.01	6850/ClO4			Ground Water	10mL	
8	E2000206-001	LH18/24-SP650_030420_BIX	.01	6850/ClO4 DOD			Water	10mL	
9	EQ2000089-01	MB		6850/ClO4 DOD			Liquid	10mL	
10	EQ2000089-02	LCS		6850/ClO4 DOD			Liquid	10mL	
11	EQ2000089-03	DLCS		6850/ClO4 DOD			Liquid	10mL	

Spiking Solutions

Name: Sodium Perchlorate 1 ug/mL (IS) (18-O) as CLO4 Inventory ID 202037 Logbook Ref: Sodium Perchlorate Expires On: 05/22/2021

E2000179-001	100.00µL	E2000180-001	100.00µL	E2000181-001	100.00µL	E2000182-001	100.00µL	E2000186-001	100.00µL	E2000186-002	100.00µL
E2000186-003	100.00µL	E2000206-001	100.00µL	EQ2000089-01	100.00µL	EQ2000089-01	100.00µL	EQ2000089-02	100.00µL	EQ2000089-02	100.00µL
EQ2000089-03	100.00µL	EQ2000089-03	100.00µL								

Name: Perchlorate Intermediate Stock1 Inventory ID 204799 Logbook Ref: 200657 1.0ug/mL KN Expires On: 05/15/2020

EQ2000089-02	10.00µL	EQ2000089-02	10.00µL	EQ2000089-03	10.00µL	EQ2000089-03	10.00µL

Preparation Steps

Step: Preparation
Started: 3/10/20 10:33
Finished: 3/10/20 12:00
By: KBROWN
Comments

Comments: _____

Reviewed By: KB Date: 03/10/2020

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Analytical Results

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ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2000181
Project:	HS20021120	**Date Collected:**	2/25/20 1400
Sample Matrix:	Water	**Date Received:**	2/26/20
Sample Name:	LH18/24-SP650_022520_BIX	**Units:**	µg/L
Lab Code:	E2000181-001	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**0.0969**	J	0.100	0.0250	1	3/10/20	3/11/20 14:44	355072	673020	

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ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2000181
Project:	HS20021120	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	µg/L
Lab Code:	EQ2000089-01	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0250	1	3/10/20	3/10/20 14:25	355072	673019	

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Accuracy & Precision

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ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2000181
Project:	HS20021120	**Date Analyzed:**	3/10/20
Sample Matrix:	Water		

Lab Control Sample Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method:	6850	**Units:**	µg/L
Prep Method:	Method	**Basis:**	NA
		Extraction Lot:	355072

	Lab Control Sample EQ2000089-02			Duplicate Lab Control Sample EQ2000089-03					
Analyte Name	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Perchlorate	1.04	1.00	104	1.13	1.00	113	84 - 119	8	15

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

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

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ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2000181
Project:	HS20021120	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Lab Control Sample	**Units:**	µg/L
Lab Code:	EQ2000089-02	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**1.04**		0.100	0.0250	1	3/10/20	3/10/20 14:33	355072	673019	

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ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2000181
Project:	HS20021120	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Duplicate Lab Control Sample	**Units:**	µg/L
Lab Code:	EQ2000089-03	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**1.13**		0.100	0.0250	1	3/10/20	3/10/20 14:41	355072	673019	

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Initial Calibration

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20191230

ICAL Date: 12/30/2019
Cal. Std. xp: 5/14/2020
ICAL ID: EC2000001

1st Review: Kneir
2nd Review: Hvan

ALS Environmental
LCMS01 -Shimadzu 8050

Mobile Phases **A:** 0.75% Formic Acid/Water 3100803-09 **B:** MeOH 3100802-01

	Sample Name		File Name	Acquisition Method	Dilution	R	Comments	Date/Time
	null	null	20191230_001	Perchlorate6850b.lcm	1x	☒		12/30/2019 10:02
	null	null	20191230_002	Perchlorate6850b.lcm	1x	☒		12/30/2019 10:07
	DIBLK	DIBLK	20191230_003	Perchlorate6850b.lcm	1x	☒		12/30/2019 10:12
	DIBLK	DIBLK	20191230_004	Perchlorate6850b.lcm	1x	☒		12/30/2019 10:20
	IB	IB	20191230_005	Perchlorate6850b.lcm	1x	☒		12/30/2019 10:28
	PERCHLORATE7	PERCHLORATE7	20191230_006	Perchlorate6850b.lcm	1x	☒	3100805-02	12/30/2019 10:48
	PERCHLORATE1	PERCHLORATE1	20191230_007	Perchlorate6850b.lcm	1x	☒	3100804-05	12/30/2019 10:56
	PERCHLORATE2	PERCHLORATE2	20191230_008	Perchlorate6850b.lcm	1x	☒	3100804-06	12/30/2019 11:04
	PERCHLORATE3	PERCHLORATE3	20191230_009	Perchlorate6850b.lcm	1x	☒	3100804-07	12/30/2019 11:12
	PERCHLORATE4	PERCHLORATE4	20191230_010	Perchlorate6850b.lcm	1x	☒	3100804-08	12/30/2019 11:19
	PERCHLORATE5	PERCHLORATE5	20191230_011	Perchlorate6850b.lcm	1x	☒	3100804-09	12/30/2019 11:27
	PERCHLORATE6	PERCHLORATE6	20191230_012	Perchlorate6850b.lcm	1x	☒	3100805-01	12/30/2019 11:35
	PERCHLORATE8	PERCHLORATE8	20191230_013	Perchlorate6850b.lcm	1x	☒	3100805-03	12/30/2019 11:43
	PERCHLORATE9	PERCHLORATE9	20191230_014	Perchlorate6850b.lcm	1x	☒	3100805-04	12/30/2019 11:51
	PERCHLORATE10	PERCHLORATE10	20191230_015	Perchlorate6850b.lcm	1x	☒	3100805-05	12/30/2019 11:59
	ICV	ICV	20191230_016	Perchlorate6850b.lcm	1x	☒	3100805-06	12/30/2019 12:07
	EQ1900442-01	EQ1900442-01	20191230_017	Perchlorate6850b.lcm	1x	☒		12/30/2019 14:01
	EQ1900442-02	EQ1900442-02	20191230_018	Perchlorate6850b.lcm	1x	☒		12/30/2019 14:09
	EQ1900442-03	EQ1900442-03	20191230_019	Perchlorate6850b.lcm	1x	☒		12/30/2019 14:17
	EQ1900442-04	EQ1900442-04	20191230_020	Perchlorate6850b.lcm	1x	☒		12/30/2019 14:25
	EQ1900442-05	EQ1900442-05	20191230_021	Perchlorate6850b.lcm	1x	☒		12/30/2019 14:33
	E1900912-001	E1900912-001	20191230_022	Perchlorate6850b.lcm	1x	☒		12/30/2019 14:41
	E1900912-002	E1900912-002	20191230_023	Perchlorate6850b.lcm	1x	☒		12/30/2019 14:49
	CCV	CCV	20191230_024	Perchlorate6850b.lcm	1x	☒	3100805-02	12/30/2019 14:57
	E1900912-001X1000	E1900912-001X1000	20191230_025	Perchlorate6850b.lcm	1000	☒		12/30/2019 17:06
	E1900912-002X100	E1900912-002X100	20191230_026	Perchlorate6850b.lcm	100	☒		12/30/2019 17:14
	CCV	CCV	20191230_027	Perchlorate6850b.lcm	1x	☒	3100805-02	12/30/2019 17:22

Initial Calibration - Detailed Report

Calibration ID: EC2000001 **Instrument ID:** E-LCMS-01
Column Name: 1

#	Lab Code	Sample Name	File Location	Aquisition Date
07	EC2000001-07	PERCHLORATE7	20191230_006	12/30/2019 10:48
01	EC2000001-01	PERCHLORATE1	20191230_007	12/30/2019 10:56
02	EC2000001-02	PERCHLORATE2	20191230_008	12/30/2019 11:04
03	EC2000001-03	PERCHLORATE3	20191230_009	12/30/2019 11:12
04	EC2000001-04	PERCHLORATE4	20191230_010	12/30/2019 11:19
05	EC2000001-05	PERCHLORATE5	20191230_011	12/30/2019 11:27
06	EC2000001-06	PERCHLORATE6	20191230_012	12/30/2019 11:35
08	EC2000001-08	PERCHLORATE8	20191230_013	12/30/2019 11:43
09	EC2000001-09	PERCHLORATE9	20191230_014	12/30/2019 11:51
10	EC2000001-10	PERCHLORATE10	20191230_015	12/30/2019 11:59

Analyte **Curve Fit** **Weighting**

Perchlorate **Average RF** **RSD = 10.79** **Average RF = 0.1352**

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.1000	0.1736	02	0.5000	0.1222	03	0.7000	0.1219	04	1.0000	0.1363
05	2.0000	0.1337	06	5.0000	0.1268	07	10.0000	0.1373	08	20.0000	0.1349
09	30.0000	0.133	10	50.0000	0.1325						

Analyte

Perchlorate

#	Amount	Calculated Conc	%D	#	Amount	Calculated Conc	%D	#	Amount	Calculated Conc	%D
01	0.1000	0.128	28.4	02	0.5000	0.452	-9.6	03	0.7000	0.631	-9.9
04	1.0000	1.01	0.8	05	2.0000	1.98	-1.1	06	5.0000	4.69	-6.2
07	10.0000	10.2	1.6	08	20.0000	20.0	-0.2	09	30.0000	29.5	-1.6
10	50.0000	49.0	-2.0								

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Initial Calibration Verification Summary Report

Calibration ID:	EC2000001	**Instrument ID:**	E-LCMS-01
Datafile ID:	20191230_016	**Column Name:**	1

Analyte	Lab Code	Type	Curve Fit	True Value	Calc Conc	Units	Result	Criteria
Perchlorate	EC2000001-11	T	Average RF	10	12.276	ng/mL	22.7	<= 25

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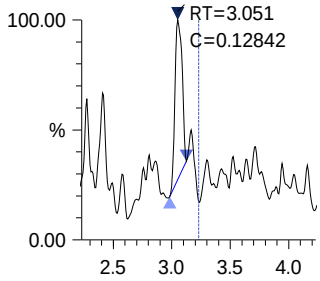
PERCHLORATE1

Date acquired: 12/30/2019 10:56:14 AM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20191230\20191230_007.lcd
Vial: 3 | Inj. Volume: 25.0000uL | Tray: 1

Name	Data Filename	Sample ID	Found RT	Area	Conc.	Acquired Date	Cal Point	Dil. Factor	Inj Vol	ISTD Area	Tray	Vial
Perchlorate	20191230_007	PERCHLORATE1	3.051	4022	0.12842	12/30/2019 10:56:14 AM	Yes	1.00000	25.0000	231680	1	3
Sodium Perchlorate-18O4_IS	20191230_007	PERCHLORATE1	3.051	231680	1.00000	12/30/2019 10:56:14 AM	No	1.00000	25.0000	231680	1	3

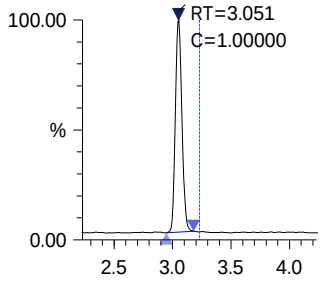
Perchlorate

Conc 0.12842
Area 4022
Q 99.00>83.00 (-) 1.27e3



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 231680
ISTD 107.00>89.00 (-) 5.94e4



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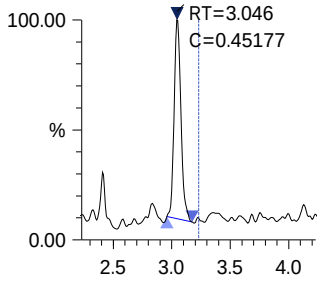
PERCHLORATE2

Date acquired: 12/30/2019 11:04:09 AM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20191230\20191230_008.lcd
Vial: 4 | Inj. Volume: 25.0000uL | Tray: 1

Name	Data Filename	Sample ID	Found RT	Area	Conc.	Acquired Date	Cal Point	Dil. Factor	Inj Vol	ISTD Area	Tray	Vial
Perchlorate	20191230_008	PERCHLORATE2	3.046	15985	0.45177	12/30/2019 11:04:09 AM	Yes	1.00000	25.0000	261704	1	4
Sodium Perchlorate-18O4_IS	20191230_008	PERCHLORATE2	3.045	261704	1.00000	12/30/2019 11:04:09 AM	No	1.00000	25.0000	261704	1	4

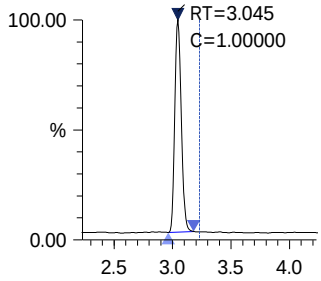
Perchlorate

Conc 0.45177
Area 15985
Q 99.00>83.00 (-) 4.21e3



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 261704
ISTD 107.00>89.00 (-) 6.75e4



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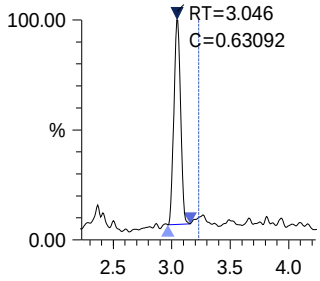
PERCHLORATE3

Date acquired: 12/30/2019 11:12:06 AM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20191230\20191230_009.lcd
Vial: 5 | Inj. Volume: 25.0000uL | Tray: 1

Name	Data Filename	Sample ID	Found RT	Area	Conc.	Acquired Date	Cal Point	Dil. Factor	Inj Vol	ISTD Area	Tray	Vial
Perchlorate	20191230_009	PERCHLORATE3	3.046	22031	0.63092	12/30/2019 11:12:06 AM	Yes	1.00000	25.0000	258274	1	5
Sodium Perchlorate-18O4_IS	20191230_009	PERCHLORATE3	3.044	258274	1.00000	12/30/2019 11:12:06 AM	No	1.00000	25.0000	258274	1	5

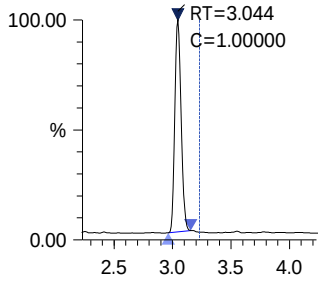
Perchlorate

Conc 0.63092
Area 22031
Q 99.00>83.00 (-) 5.75e3



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 258274
ISTD 107.00>89.00 (-) 6.88e4



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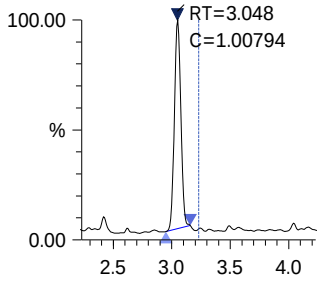
PERCHLORATE4

Date acquired: 12/30/2019 11:19:58 AM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20191230\20191230_010.lcd
Vial: 6 | Inj. Volume: 25.0000uL | Tray: 1

Name	Data Filename	Sample ID	Found RT	Area	Conc.	Acquired Date	Cal Point	Dil. Factor	Inj Vol	ISTD Area	Tray	Vial
Perchlorate	20191230_010	PERCHLORATE4	3.048	36488	1.00794	12/30/2019 11:19:58 AM	Yes	1.00000	25.0000	267754	1	6
Sodium Perchlorate-18O4_IS	20191230_010	PERCHLORATE4	3.046	267754	1.00000	12/30/2019 11:19:58 AM	No	1.00000	25.0000	267754	1	6

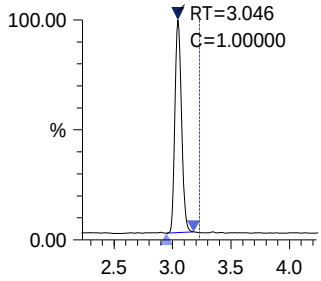
Perchlorate

Conc 1.00794
Area 36488
Q 99.00>83.00 (-) 9.73e3



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 267754
ISTD 107.00>89.00 (-) 6.78e4



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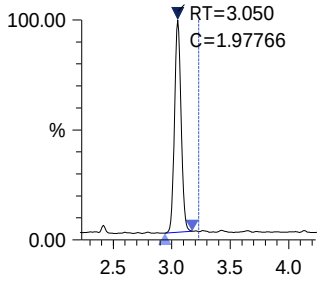
PERCHLORATE5

Date acquired: 12/30/2019 11:27:53 AM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20191230\20191230_011.lcd
Vial: 7 | Inj. Volume: 25.0000uL | Tray: 1

Name	Data Filename	Sample ID	Found RT	Area	Conc.	Acquired Date	Cal Point	Dil. Factor	Inj Vol	ISTD Area	Tray	Vial
Perchlorate	20191230_011	PERCHLORATE5	3.050	74631	1.97766	12/30/2019 11:27:53 AM	Yes	1.00000	25.0000	279118	1	7
Sodium Perchlorate-18O4_IS	20191230_011	PERCHLORATE5	3.046	279118	1.00000	12/30/2019 11:27:53 AM	No	1.00000	25.0000	279118	1	7

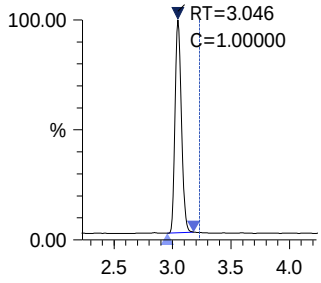
Perchlorate

Conc 1.97766
Area 74631
Q 99.00>83.00 (-) 1.92e4



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 279118
ISTD 107.00>89.00 (-) 7.33e4



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PERCHLORATE6

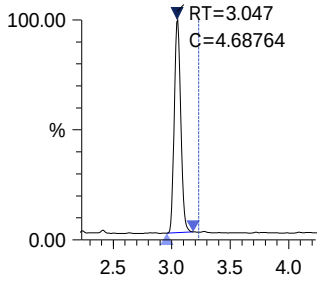
Date acquired: 12/30/2019 11:35:50 AM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20191230\20191230_012.lcd
Vial: 8 | Inj. Volume: 25.0000uL | Tray: 1

Name	Data Filename	Sample ID	Found RT	Area	Conc.	Acquired Date	Cal Point	Dil. Factor	Inj Vol	ISTD Area	Tray	Vial
Perchlorate	20191230_012	PERCHLORATE6	3.047	159122	4.68764	12/30/2019 11:35:50 AM	Yes	1.00000	25.0000	251072	1	8
Sodium Perchlorate-18O4_IS	20191230_012	PERCHLORATE6	3.045	251072	1.00000	12/30/2019 11:35:50 AM	No	1.00000	25.0000	251072	1	8

Perchlorate

Conc 4.68764
Area 159122

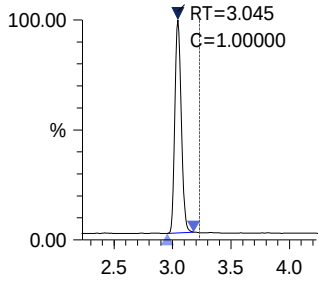
Q 99.00>83.00 (-) 4.12e4



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 251072

ISTD 107.00>89.00 (-) 6.53e4



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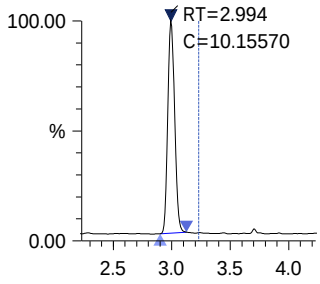
PERCHLORATE7

Date acquired: 12/30/2019 10:48:20 AM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20191230\20191230_006.lcd
Vial: 9 | Inj. Volume: 25.0000uL | Tray: 1

Name	Data Filename	Sample ID	Found RT	Area	Conc.	Acquired Date	Cal Point	Dil. Factor	Inj Vol	ISTD Area	Tray	Vial
Perchlorate	20191230_006	PERCHLORATE7	2.994	298821	10.15570	12/30/2019 10:48:20 AM	Yes	1.00000	25.0000	217632	1	9
Sodium Perchlorate-18O4_IS	20191230_006	PERCHLORATE7	2.991	217632	1.00000	12/30/2019 10:48:20 AM	No	1.00000	25.0000	217632	1	9

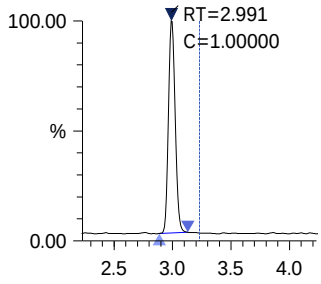
Perchlorate

Conc 10.15570
Area 298821
Q 99.00>83.00 (-) 7.46e4



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 217632
ISTD 107.00>89.00 (-) 5.38e4



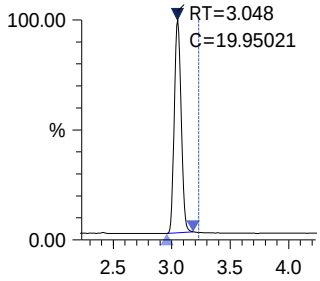
PERCHLORATE8

Date acquired: 12/30/2019 11:43:47 AM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20191230\20191230_013.lcd
Vial: 10 | Inj. Volume: 25.0000uL | Tray: 1

Name	Data Filename	Sample ID	Found RT	Area	Conc.	Acquired Date	Cal Point	Dil. Factor	Inj Vol	ISTD Area	Tray	Vial
Perchlorate	20191230_013	PERCHLORATE8	3.048	557358	19.95021	12/30/2019 11:43:47 AM	Yes	1.00000	25.0000	206636	1	10
Sodium Perchlorate-18O4_IS	20191230_013	PERCHLORATE8	3.045	206636	1.00000	12/30/2019 11:43:47 AM	No	1.00000	25.0000	206636	1	10

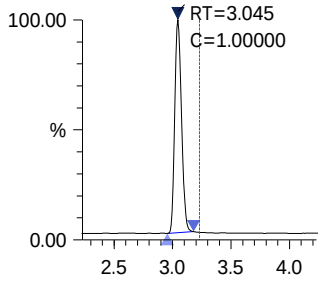
Perchlorate

Conc 19.95021
Area 557358
Q 99.00>83.00 (-) 1.37e5



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 206636
ISTD 107.00>89.00 (-) 5.11e4



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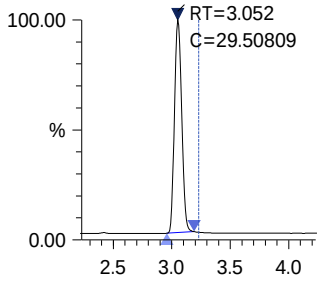
PERCHLORATE9

Date acquired: 12/30/2019 11:51:43 AM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20191230\20191230_014.lcd
Vial: 11 | Inj. Volume: 25.0000uL | Tray: 1

Name	Data Filename	Sample ID	Found RT	Area	Conc.	Acquired Date	Cal Point	Dil. Factor	Inj Vol	ISTD Area	Tray	Vial
Perchlorate	20191230_014	PERCHLORATE9	3.052	730647	29.50809	12/30/2019 11:51:43 AM	Yes	1.00000	25.0000	183142	1	11
Sodium Perchlorate-18O4_IS	20191230_014	PERCHLORATE9	3.049	183142	1.00000	12/30/2019 11:51:43 AM	No	1.00000	25.0000	183142	1	11

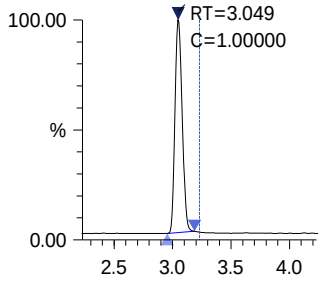
Perchlorate

Conc 29.50809
Area 730647
Q 99.00>83.00 (-) 1.70e5



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 183142
ISTD 107.00>89.00 (-) 4.27e4



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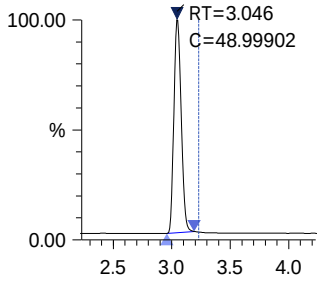
PERCHLORATE10

Date acquired: 12/30/2019 11:59:38 AM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20191230\20191230_015.lcd
Vial: 12 | Inj. Volume: 25.0000uL | Tray: 1

Name	Data Filename	Sample ID	Found RT	Area	Conc.	Acquired Date	Cal Point	Dil. Factor	Inj Vol	ISTD Area	Tray	Vial
Perchlorate	20191230_015	PERCHLORATE10	3.046	1090166	48.99902	12/30/2019 11:59:38 AM	Yes	1.00000	25.0000	164560	1	12
Sodium Perchlorate-18O4_IS	20191230_015	PERCHLORATE10	3.043	164560	1.00000	12/30/2019 11:59:38 AM	No	1.00000	25.0000	164560	1	12

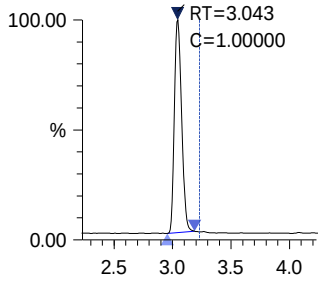
Perchlorate

Conc 48.99902
Area 1090166
Q 99.00>83.00 (-) 2.51e5



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 164560
ISTD 107.00>89.00 (-) 3.80e4



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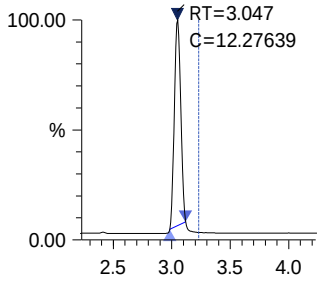
ICV

Date acquired: 12/30/2019 12:07:32 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20191230\20191230_016.lcd
Vial: 13 | Inj. Volume: 25.0000uL | Tray: 1

Name	Data Filename	Sample ID	Found RT	Area	Conc.	Acquired Date	Cal Point	Dil. Factor	Inj Vol	ISTD Area	Tray	Vial
Perchlorate	20191230_016	ICV	3.047	347932	12.27639	12/30/2019 12:07:32 PM	No	1.00000	25.0000	209626	1	13
Sodium Perchlorate-18O4_IS	20191230_016	ICV	3.045	209626	1.00000	12/30/2019 12:07:32 PM	No	1.00000	25.0000	209626	1	13

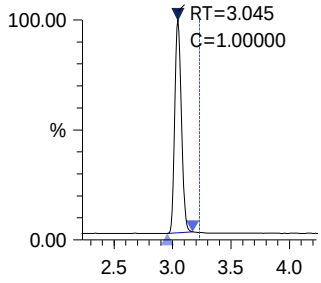
Perchlorate

Conc 12.27639
Area 347932
Q 99.00>83.00 (-) 9.49e4



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 209626
ISTD 107.00>89.00 (-) 5.28e4



Chromatograms and Selected Ion Monitoring

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 320, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

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20200310

ICAL Date: 12/30/2019
Cal. Std. xp: 5/14/2020
ICAL ID: EC2000001

1st Review: Kneir
2nd Review: Hvan

ALS Environmental
LCMS01 -Shimadzu 8050

Mobile Phases **A:** 0.75% Formic Acid/Water 3100803-09 **B:** MeOH 3100802-01

	Sample Name		File Name	Acquisition Method	Dilution	R	Comments	Date/Time
	null		20200310_001	Perchlorate6850b.lcm	1x	☒		3/10/2020 13:26
	null		20200310_002	Perchlorate6850b.lcm	1x	☒		3/10/2020 13:31
	DI		20200310_003	Perchlorate6850b.lcm	1x	☒		3/10/2020 13:36
	IB		20200310_004	Perchlorate6850b.lcm	1x	☒		3/10/2020 13:44
	PERCHLORATE7		20200310_005	Perchlorate6850b.lcm	1x	☒	3100805-02	3/10/2020 13:52
	LODV		20200310_006	Perchlorate6850b.lcm	1x	☒		3/10/2020 14:17
	EQ2000089-01		20200310_007	Perchlorate6850b.lcm	1x	☒		3/10/2020 14:25
	EQ2000089-02		20200310_008	Perchlorate6850b.lcm	1x	☒		3/10/2020 14:33
	EQ2000089-03		20200310_009	Perchlorate6850b.lcm	1x	☒		3/10/2020 14:41
	E2000179-001		20200310_010	Perchlorate6850b.lcm	1x	☒	needs DL	3/10/2020 14:49
	E2000180-001		20200310_011	Perchlorate6850b.lcm	1x	☒	needs RR-poss carryover	3/10/2020 14:57
	E2000181-001		20200310_012	Perchlorate6850b.lcm	1x	☒	needs RR-poss carryover	3/10/2020 15:05
	E2000182-001		20200310_013	Perchlorate6850b.lcm	1x	☒	needs DL	3/10/2020 15:13
	E2000186-001		20200310_014	Perchlorate6850b.lcm	1x	☒	needs DL	3/10/2020 15:20
	E2000186-002		20200310_015	Perchlorate6850b.lcm	1x	☒	needs RR-poss carryover	3/10/2020 15:28
	E2000186-003		20200310_016	Perchlorate6850b.lcm	1x	☒	needs DL	3/10/2020 15:36
	PERCHLORATE7		20200310_017	Perchlorate6850b.lcm	1x	☒	3100805-02	3/10/2020 15:44
	E2000206-001		20200310_018	Perchlorate6850b.lcm	1x	☒		3/10/2020 15:52
	E2000180-001		20200310_019	Perchlorate6850b.lcm	1x	☒		3/10/2020 16:00
	E2000186-002		20200310_020	Perchlorate6850b.lcm	1x	☒		3/10/2020 16:08
	PERCHLORATE7		20200310_021	Perchlorate6850b.lcm	1x	☒	3100805-02	3/10/2020 16:16
	IB		20200310_022	Perchlorate6850b.lcm	1x	☒		3/10/2020 16:24

20200311

ICAL Date: 12/30/2019
Cal. Std. xp: 5/14/2020
ICAL ID: EC2000001

1st Review: Kneir
2nd Review: Hvan

ALS Environmental
LCMS01 -Shimadzu 8050

Mobile Phases **A:** 0.75% Formic Acid/Water 3100803-09 **B:** MeOH 3100802-01

	Sample Name		File Name	Acquisition Method	Dilution	R	Comments	Date/Time
	null		20200311_001	Perchlorate6850b.lcm	1x	☒		3/11/2020 11:12
	null		20200311_002	Perchlorate6850b.lcm	1x	☒		3/11/2020 11:17
	DI		20200311_003	Perchlorate6850b.lcm	1x	☒		3/11/2020 11:23
	IB		20200311_004	Perchlorate6850b.lcm	1x	☒		3/11/2020 11:30
	PERCHLORATE7		20200311_005	Perchlorate6850b.lcm	1x	☒	3100805-02	3/11/2020 11:38
	LODV		20200311_006	Perchlorate6850b.lcm	1x	☒		3/11/2020 11:46
	E2000206-001		20200311_007	Perchlorate6850b.lcm	1x	☒		3/11/2020 11:54
	E2000180-001		20200311_008	Perchlorate6850b.lcm	1x	☒		3/11/2020 12:02
	E2000186-002		20200311_009	Perchlorate6850b.lcm	1x	☒		3/11/2020 12:10
	E2000181-001		20200311_010	Perchlorate6850b.lcm	1x	☒		3/11/2020 12:18
	E2000179-001X1000		20200311_011	Perchlorate6850b.lcm	1000	☒		3/11/2020 12:37
	E2000182-001X250		20200311_012	Perchlorate6850b.lcm	250	☒		3/11/2020 12:45
	E2000186-001X1000		20200311_013	Perchlorate6850b.lcm	1000	☒		3/11/2020 12:53
	E2000186-003X1000		20200311_014	Perchlorate6850b.lcm	1000	☒		3/11/2020 13:01
	PERCHLORATE7		20200311_015	Perchlorate6850b.lcm	1x	☒	3100805-02	3/11/2020 13:28

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ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2000181
Project:	HS20021120	**Date Analyzed:**	3/10/20 13:52

Internal Standard Area and RT Summary

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

File ID:	I:\LCMS01\DATA\20200310\20200310_005	**Lab Code:**	EQ2000093-01
Instrument ID:	E-LCMS-01	**Analysis Lot:**	673019
Analytical Method:	6850	**Signal ID:**	1

		Sodium Perchlorate-18O4	
		Area	**RT**
	ICAL Average ==>	232,157	3.04
	Upper Limit ==>	348,236	5.04
	Lower Limit ==>	116,079	1.04
Associated Analyses			
Continuing Calibration Verification	EQ2000093-01	258,077	3.07
Method Blank	EQ2000089-01	266,181	3.07
Lab Control Sample	EQ2000089-02	259,616	3.07
Duplicate Lab Control Sample	EQ2000089-03	279,998	3.07

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2000181
Project:	HS20021120	**Date Analyzed:**	3/10/20 15:44

Internal Standard Area and RT Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

File ID:	I:\LCMS01\DATA\20200310\20200310_017	**Lab Code:**	EQ2000093-02
Instrument ID:	E-LCMS-01	**Analysis Lot:**	673019
Analytical Method:	6850	**Signal ID:**	1

		Sodium Perchlorate-18O4	
		Area	**RT**
	ICAL Average ==>	232,157	3.04
	Upper Limit ==>	348,236	5.04
	Lower Limit ==>	116,079	1.04
Associated Analyses			
Continuing Calibration Verification	EQ2000093-02	289,206	3.07

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2000181
Project:	HS20021120	**Date Analyzed:**	3/11/20 11:38

Internal Standard Area and RT Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

File ID:	I:\LCMS01\DATA\20200311\20200311_005	**Lab Code:**	EQ2000094-01
Instrument ID:	E-LCMS-01	**Analysis Lot:**	673020
Analytical Method:	6850	**Signal ID:**	1

		Sodium Perchlorate-18O4	
		Area	**RT**
	ICAL Average ==>	232,157	3.04
	Upper Limit ==>	348,236	5.04
	Lower Limit ==>	116,079	1.04
Associated Analyses			
Continuing Calibration Verification	EQ2000094-01	280,844	3.07

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

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ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2000181
Project:	HS20021120	**Date Analyzed:**	3/11/20 13:28

Internal Standard Area and RT Summary

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

File ID:	I:\LCMS01\DATA\20200311\20200311_015	**Lab Code:**	EQ2000094-02
Instrument ID:	E-LCMS-01	**Analysis Lot:**	673020
Analytical Method:	6850	**Signal ID:**	1

		Sodium Perchlorate-18O4	
		Area	**RT**
	ICAL Average ==>	232,157	3.04
	Upper Limit ==>	348,236	5.04
	Lower Limit ==>	116,079	1.04
Associated Analyses			
Continuing Calibration Verification	EQ2000094-02	305,228	3.01
LH18/24-SP650_022520_BIX	E2000181-001	341,659	3.06

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

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ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2000181
Project:	HS20021120	**Date Analyzed:**	3/11/20 15:00

Internal Standard Area and RT Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

File ID:	I:\LCMS01\DATA\20200311\20200311_019	**Lab Code:**	EQ2000094-03
Instrument ID:	E-LCMS-01	**Analysis Lot:**	673020
Analytical Method:	6850	**Signal ID:**	1

		Sodium Perchlorate-18O4	
		Area	**RT**
	ICAL Average ==>	232,157	3.04
	Upper Limit ==>	348,236	5.04
	Lower Limit ==>	116,079	1.04
Associated Analyses			
Continuing Calibration Verification	EQ2000094-03	235,110	3.06

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

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ALS Group Houston

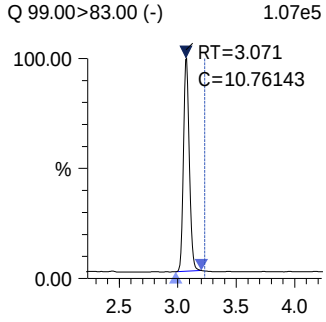
PERCHLORATE7

Date acquired: 3/10/2020 1:52:29 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200310\20200310_005.lcd
Vial: 3 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE7	3/10/2020 1:52:29 PM	375491	10.76143	20200310_005	3.071	25.0000	1.0000	3
Sodium Perchlorate-18O4_IS	PERCHLORATE7	3/10/2020 1:52:29 PM	258077	1.00000	20200310_005	3.071	25.0000	1.0000	3

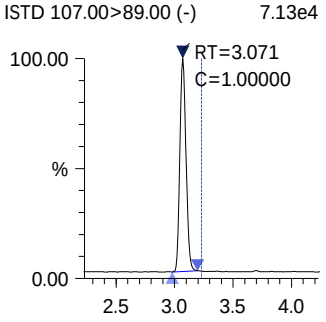
Perchlorate

Conc 10.76143
Area 375491



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 258077



RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group Houston

EQ2000089-01

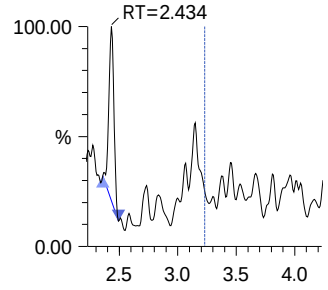
Date acquired: 3/10/2020 2:25:38 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200310\20200310_007.lcd
Vial: 5 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	EQ2000089-01	3/10/2020 2:25:38 PM	----	----	20200310_007	----	25.0000	1.0000	5
Sodium Perchlorate-18O4_IS	EQ2000089-01	3/10/2020 2:25:38 PM	266181	1.00000	20200310_007	3.074	25.0000	1.0000	5

Perchlorate

Conc ----
Area ----

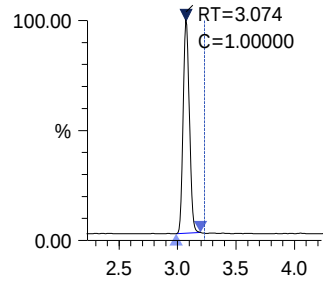
Q 99.00>83.00 (-) 7.48e2



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 266181

ISTD 107.00>89.00 (-) 7.25e4



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ALS Group Houston

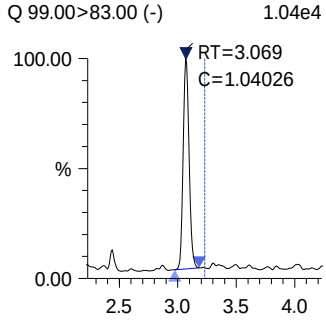
EQ2000089-02

Date acquired: 3/10/2020 2:33:31 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200310\20200310_008.lcd
Vial: 6 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	EQ2000089-02	3/10/2020 2:33:31 PM	36514	1.04026	20200310_008	3.069	25.0000	1.0000	6
Sodium Perchlorate-18O4_IS	EQ2000089-02	3/10/2020 2:33:31 PM	259616	1.00000	20200310_008	3.067	25.0000	1.0000	6

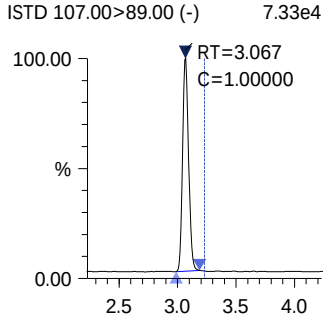
Perchlorate

Conc 1.04026
Area 36514



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 259616



RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group Houston

EQ2000089-03

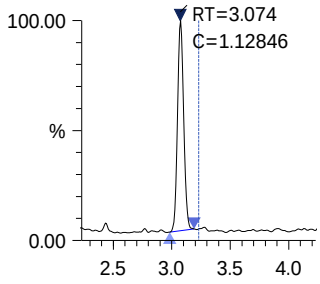
Date acquired: 3/10/2020 2:41:26 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200310\20200310_009.lcd
Vial: 7 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	EQ2000089-03	3/10/2020 2:41:26 PM	42719	1.12846	20200310_009	3.074	25.0000	1.0000	7
Sodium Perchlorate-18O4_IS	EQ2000089-03	3/10/2020 2:41:26 PM	279998	1.00000	20200310_009	3.071	25.0000	1.0000	7

Perchlorate

Conc 1.12846
Area 42719

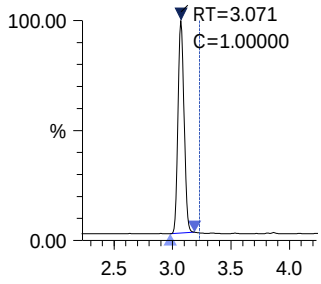
Q 99.00>83.00 (-) 1.17e4



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 279998

ISTD 107.00>89.00 (-) 7.84e4



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ALS Group Houston

PERCHLORATE7

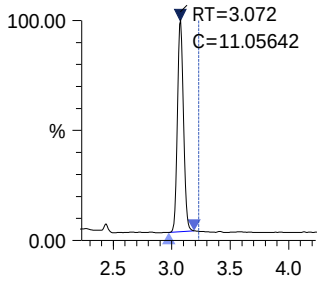
Date acquired: 3/10/2020 3:44:38 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200310\20200310_017.lcd
Vial: 3 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE7	3/10/2020 3:44:38 PM	432316	11.05642	20200310_017	3.072	25.0000	1.0000	3
Sodium Perchlorate-18O4_IS	PERCHLORATE7	3/10/2020 3:44:38 PM	289206	1.00000	20200310_017	3.071	25.0000	1.0000	3

Perchlorate

Conc 11.05642
Area 432316

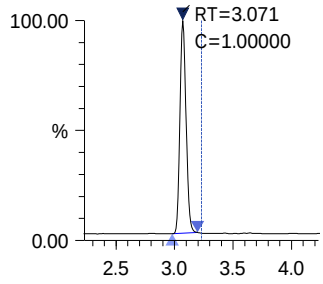
Q 99.00>83.00 (-) 1.20e5



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 289206

ISTD 107.00>89.00 (-) 8.06e4



RIGHT SOLUTIONS | RIGHT PARTNER

ALS Group Houston

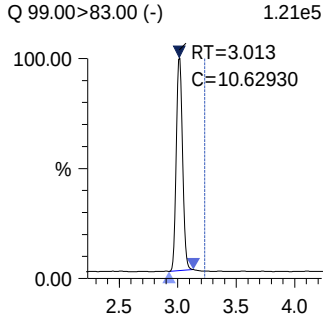
PERCHLORATE7

Date acquired: 3/11/2020 1:28:17 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200311\20200311_015.lcd
Vial: 3 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE7	3/11/2020 1:28:17 PM	438640	10.62930	20200311_015	3.013	25.0000	1.0000	3
Sodium Perchlorate-18O4_IS	PERCHLORATE7	3/11/2020 1:28:17 PM	305228	1.00000	20200311_015	3.011	25.0000	1.0000	3

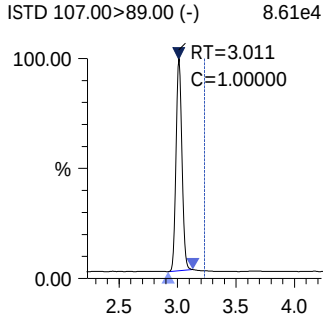
Perchlorate

Conc 10.62930
Area 438640



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 305228



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ALS Group Houston

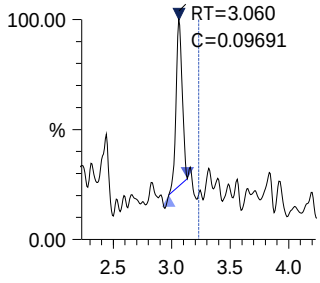
E2000181-001

Date acquired: 3/11/2020 2:44:51 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200311\20200311_017.lcd
Vial: 10 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	E2000181-001	3/11/2020 2:44:51 PM	4476	0.09691	20200311_017	3.060	25.0000	1.0000	10
Sodium Perchlorate-18O4_IS	E2000181-001	3/11/2020 2:44:51 PM	341659	1.00000	20200311_017	3.061	25.0000	1.0000	10

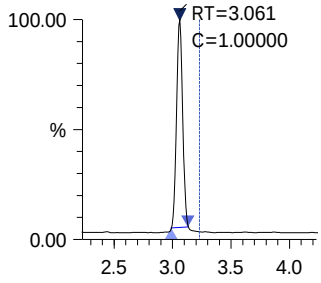
Perchlorate

Conc 0.09691
Area 4476
Q 99.00>83.00 (-) 1.55e3



Sodium Perchlorate-18O4 _IS

Conc 1.00000
Area 341659
ISTD 107.00>89.00 (-) 9.74e4



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ALS Group Houston

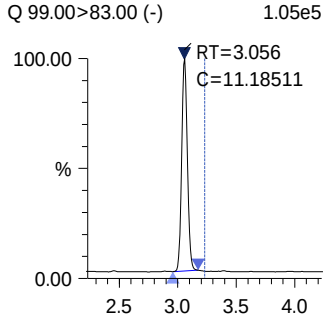
PERCHLORATE7

Date acquired: 3/11/2020 3:00:40 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20200311\20200311_019.lcd
Vial: 3 | Inj. Volume: 25.0000uL | Tray: 1

Name	Sample ID	Acquired Date	Area	Conc.	Data Filename	Found RT	Inj Vol	ISTD Amount	Vial
Perchlorate	PERCHLORATE7	3/11/2020 3:00:40 PM	355542	11.18511	20200311_019	3.056	25.0000	1.0000	3
Sodium Perchlorate-18O4_IS	PERCHLORATE7	3/11/2020 3:00:40 PM	235110	1.00000	20200311_019	3.055	25.0000	1.0000	3

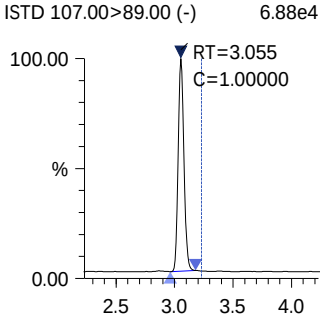
Perchlorate

Conc 11.18511
Area 355542



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 235110



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

March 12, 2020

Marcia Olive
Bhate Environmental Associates, Inc.
445 Union Blvd Ste 129
Lakewood, CO 80228

Work Order: **HS20021121**

Laboratory Results for: **Groundwater Treatment Plant Quarterly Influent Samples**

Dear Marcia,

ALS Environmental received 2 sample(s) on Feb 26, 2020 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: 12-Mar-20

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Influent Samples
Work Order: HS20021121

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS20021121-01	LH18/24-SP140_022520	Water		25-Feb-2020 14:00	26-Feb-2020 09:00	☐
HS20021121-02	Trip Blank	Water	CG 011520 -100	25-Feb-2020 00:00	26-Feb-2020 09:00	☐

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ALS Houston, US Date: 12-Mar-20

Client: Bhate Environmental Associates, Inc. **CASE NARRATIVE**
Project: Groundwater Treatment Plant Quarterly Influent Samples
Work Order: HS20021121

Work Order Comments

• Analysis of Perchlorate was performed by ALS ALS Houston TX, High Resolution. Laboratory. Final report attached.

GCMS Semivolatiles by Method SW8270SIM

Batch ID: 151088

Sample ID: LCSD-151088

• LCS/LCSD RPD was above the RPD limits for the surrogates. The individual recoveries met acceptance criteria..

GCMS Volatiles by Method SW8260

Batch ID: R357105

Sample ID: HS20021120-01MS

• MS and MSD are for an unrelated sample

Sample ID: LH18/24-SP140_022520 (HS20021121-01)

• Surrogate Toluene_d8 exceeded recovery limits due to matrix. Confirmed by re-analysis @ dilution.

Metals by Method SW7470

Batch ID: 151269

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

Metals by Method SW6020

Batch ID: 151244

Sample ID: HS20021120-01MS

• MS and MSD are for an unrelated sample

WetChemistry by Method E1664A

Batch ID: R357384

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

WetChemistry by Method E410.4

Batch ID: R357344

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

WetChemistry by Method SW9056

Batch ID: R357300

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

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ALS Houston, US Date: 12-Mar-20

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**
Project: Groundwater Treatment Plant Quarterly Influent Samples WorkOrder:HS20021121
Sample ID: LH18/24-SP140_022520 Lab ID:HS20021121-01
Collection Date: 25-Feb-2020 14:00 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	10	U	6.0	10	20	UG/L	20	26-Feb-2020 16:16
1,1,1-Trichloroethane	10	U	4.0	10	20	UG/L	20	26-Feb-2020 16:16
1,1,2,2-Tetrachloroethane	10	U	10	10	20	UG/L	20	26-Feb-2020 16:16
1,1,2-Trichloroethane	10	U	6.0	10	20	UG/L	20	26-Feb-2020 16:16
1,1-Dichloroethane	10	U	4.0	10	20	UG/L	20	26-Feb-2020 16:16
1,1-Dichloroethene	10	U	4.0	10	20	UG/L	20	26-Feb-2020 16:16
1,1-Dichloropropene	10	U	6.0	10	20	UG/L	20	26-Feb-2020 16:16
1,2,3-Trichlorobenzene	10	U	8.0	10	20	UG/L	20	26-Feb-2020 16:16
1,2,3-Trichloropropane	10	U	10	10	20	UG/L	20	26-Feb-2020 16:16
1,2,4-Trichlorobenzene	10	U	10	10	20	UG/L	20	26-Feb-2020 16:16
1,2,4-Trimethylbenzene	10	U	6.0	10	20	UG/L	20	26-Feb-2020 16:16
1,2-Dibromo-3-chloropropane	10	U	4.0	10	20	UG/L	20	26-Feb-2020 16:16
1,2-Dibromoethane	10	U	4.0	10	20	UG/L	20	26-Feb-2020 16:16
1,2-Dichlorobenzene	10	U	10	10	20	UG/L	20	26-Feb-2020 16:16
1,2-Dichloroethane	**39**		**4.0**	**10**	**20**	**UG/L**	20	26-Feb-2020 16:16
1,2-Dichloropropane	10	U	10	10	20	UG/L	20	26-Feb-2020 16:16
1,3,5-Trimethylbenzene	10	U	6.0	10	20	UG/L	20	26-Feb-2020 16:16
1,3-Dichlorobenzene	10	U	8.0	10	20	UG/L	20	26-Feb-2020 16:16
1,3-Dichloropropane	10	U	6.0	10	20	UG/L	20	26-Feb-2020 16:16
1,4-Dichlorobenzene	10	U	8.0	10	20	UG/L	20	26-Feb-2020 16:16
2,2-Dichloropropane	10	U	4.0	10	20	UG/L	20	26-Feb-2020 16:16
2-Butanone	20	U	10	20	40	UG/L	20	26-Feb-2020 16:16
2-Chlorotoluene	10	U	6.0	10	20	UG/L	20	26-Feb-2020 16:16
2-Hexanone	20	U	20	20	40	UG/L	20	26-Feb-2020 16:16
4-Chlorotoluene	10	U	8.0	10	20	UG/L	20	26-Feb-2020 16:16
4-Isopropyltoluene	10	U	6.0	10	20	UG/L	20	26-Feb-2020 16:16
4-Methyl-2-pentanone	20	U	14	20	40	UG/L	20	26-Feb-2020 16:16
Acetone	20	U	8.0	20	40	UG/L	20	26-Feb-2020 16:16
Benzene	10	U	4.0	10	20	UG/L	20	26-Feb-2020 16:16
Bromobenzene	10	U	8.0	10	20	UG/L	20	26-Feb-2020 16:16
Bromochloromethane	10	U	4.0	10	20	UG/L	20	26-Feb-2020 16:16
Bromodichloromethane	10	U	4.0	10	20	UG/L	20	26-Feb-2020 16:16
Bromoform	10	U	8.0	10	20	UG/L	20	26-Feb-2020 16:16
Bromomethane	10	U	8.0	10	20	UG/L	20	26-Feb-2020 16:16
Carbon disulfide	20	U	12	20	40	UG/L	20	26-Feb-2020 16:16
Carbon tetrachloride	10	U	10	10	20	UG/L	20	26-Feb-2020 16:16
Chlorobenzene	10	U	6.0	10	20	UG/L	20	26-Feb-2020 16:16
Chloroethane	10	U	6.0	10	20	UG/L	20	26-Feb-2020 16:16
Chloroform	10	U	4.0	10	20	UG/L	20	26-Feb-2020 16:16

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 12-Mar-20

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**
Project: Groundwater Treatment Plant Quarterly Influent Samples WorkOrder:HS20021121
Sample ID: LH18/24-SP140_022520 Lab ID:HS20021121-01
Collection Date: 25-Feb-2020 14:00 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloromethane	10	U	4.0	10	20	UG/L	20	26-Feb-2020 16:16
cis-1,2-Dichloroethene	**2,100**		**4.0**	**10**	**20**	**UG/L**	20	26-Feb-2020 16:16
cis-1,3-Dichloropropene	10	U	2.0	10	20	UG/L	20	26-Feb-2020 16:16
Dibromochloromethane	10	U	6.0	10	20	UG/L	20	26-Feb-2020 16:16
Dibromomethane	10	U	4.0	10	20	UG/L	20	26-Feb-2020 16:16
Dichlorodifluoromethane	10	U	6.0	10	20	UG/L	20	26-Feb-2020 16:16
Ethylbenzene	10	U	6.0	10	20	UG/L	20	26-Feb-2020 16:16
Hexachlorobutadiene	20	U	20	20	20	UG/L	20	26-Feb-2020 16:16
Isopropylbenzene	10	U	6.0	10	20	UG/L	20	26-Feb-2020 16:16
m,p-Xylene	20	U	10	20	40	UG/L	20	26-Feb-2020 16:16
Methylene chloride	**2,200**		**8.0**	**20**	**40**	**UG/L**	20	26-Feb-2020 16:16
n-Butylbenzene	10	U	8.0	10	20	UG/L	20	26-Feb-2020 16:16
n-Propylbenzene	10	U	6.0	10	20	UG/L	20	26-Feb-2020 16:16
Naphthalene	10	U	6.0	10	20	UG/L	20	26-Feb-2020 16:16
o-Xylene	10	U	6.0	10	20	UG/L	20	26-Feb-2020 16:16
sec-Butylbenzene	10	U	6.0	10	20	UG/L	20	26-Feb-2020 16:16
Styrene	10	U	6.0	10	20	UG/L	20	26-Feb-2020 16:16
tert-Butylbenzene	10	U	6.0	10	20	UG/L	20	26-Feb-2020 16:16
Tetrachloroethene	**52**		**6.0**	**10**	**20**	**UG/L**	20	26-Feb-2020 16:16
Toluene	10	U	4.0	10	20	UG/L	20	26-Feb-2020 16:16
trans-1,2-Dichloroethene	10	U	4.0	10	20	UG/L	20	26-Feb-2020 16:16
trans-1,3-Dichloropropene	10	U	4.0	10	20	UG/L	20	26-Feb-2020 16:16
Trichloroethene	**4,900**		**40**	**100**	**200**	**UG/L**	200	26-Feb-2020 15:52
Trichlorofluoromethane	10	U	6.0	10	20	UG/L	20	26-Feb-2020 16:16
Vinyl chloride	**68**		**4.0**	**10**	**20**	**UG/L**	20	26-Feb-2020 16:16
Surr: 1,2-Dichloroethane-d4	*94.9*			**0**	*81-118*	*%REC*	*200*	*26-Feb-2020 15:52*
Surr: 1,2-Dichloroethane-d4	*95.9*			**0**	*81-118*	*%REC*	*20*	*26-Feb-2020 16:16*
Surr: 4-Bromofluorobenzene	*93.8*			**0**	*85-114*	*%REC*	*200*	*26-Feb-2020 15:52*
Surr: 4-Bromofluorobenzene	*105*			**0**	*85-114*	*%REC*	*20*	*26-Feb-2020 16:16*
Surr: Dibromofluoromethane	*93.9*			**0**	*80-119*	*%REC*	*20*	*26-Feb-2020 16:16*
Surr: Dibromofluoromethane	*95.2*			**0**	*80-119*	*%REC*	*200*	*26-Feb-2020 15:52*
Surr: Toluene-d8	*108*			**0**	*89-112*	*%REC*	*200*	*26-Feb-2020 15:52*
Surr: Toluene-d8	*115*	*S*		**0**	*89-112*	*%REC*	*20*	*26-Feb-2020 16:16*
SEMIVOLATILES SIM		**Method:SW8270SIM**				Prep:SW3510 / 27-Feb-2020		Analyst: LG
1,4-Dioxane	**0.45**		**0.010**	**0.010**	**0.010**	**ug/L**	1	04-Mar-2020 11:01
Surr: 2-Fluorobiphenyl	*111*			**0**	*40-140*	*%REC*	*1*	*04-Mar-2020 11:01*
Surr: 4-Terphenyl-d14	*115*			**0**	*40-140*	*%REC*	*1*	*04-Mar-2020 11:01*
Surr: Nitrobenzene-d5	*118*			**0**	*40-140*	*%REC*	*1*	*04-Mar-2020 11:01*

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

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ALS Houston, US Date: 12-Mar-20

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**
Project: Groundwater Treatment Plant Quarterly Influent Samples WorkOrder:HS20021121
Sample ID: LH18/24-SP140_022520 Lab ID:HS20021121-01
Collection Date: 25-Feb-2020 14:00 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 03-Mar-2020		Analyst: JHD
Aluminum	**0.301**		**0.00180**	**0.00500**	**0.0100**	**mg/L**	1	04-Mar-2020 16:53
Antimony	**0.00262**	J	**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	04-Mar-2020 16:53
Arsenic	**0.000888**	J	**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	04-Mar-2020 16:53
Barium	**0.579**		**0.00190**	**0.00250**	**0.00500**	**mg/L**	1	04-Mar-2020 16:53
Beryllium	**0.000206**	J	**0.000200**	**0.000500**	**0.00200**	**mg/L**	1	04-Mar-2020 16:53
Cadmium	**0.000947**	J	**0.000200**	**0.000500**	**0.00200**	**mg/L**	1	04-Mar-2020 16:53
Calcium	**42.4**		**0.0340**	**0.0500**	**0.500**	**mg/L**	1	04-Mar-2020 16:53
Chromium	**0.0170**		**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	04-Mar-2020 16:53
Cobalt	**0.00827**		**0.000100**	**0.000500**	**0.00500**	**mg/L**	1	04-Mar-2020 16:53
Iron	**0.829**		**0.0120**	**0.0500**	**0.200**	**mg/L**	1	04-Mar-2020 16:53
Lead	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	04-Mar-2020 16:53
Magnesium	**25.9**		**0.0100**	**0.0500**	**0.200**	**mg/L**	1	04-Mar-2020 16:53
Manganese	**0.520**		**0.000700**	**0.00250**	**0.00500**	**mg/L**	1	04-Mar-2020 16:53
Nickel	**0.0385**		**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	04-Mar-2020 16:53
Potassium	**1.18**		**0.0180**	**0.0500**	**0.200**	**mg/L**	1	04-Mar-2020 16:53
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	04-Mar-2020 16:53
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	04-Mar-2020 16:53
Sodium	**176**		**0.0140**	**0.0500**	**0.200**	**mg/L**	1	04-Mar-2020 16:53
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	04-Mar-2020 16:53
Vanadium	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	04-Mar-2020 16:53
Zinc	**0.689**		**0.00200**	**0.00250**	**0.00500**	**mg/L**	1	04-Mar-2020 16:53
MERCURY BY SW7470A		**Method:SW7470**				Prep:SW7470 / 03-Mar-2020		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	03-Mar-2020 16:04
OIL & GREASE (HEM) BY E1664A		**Method:E1664A**						Analyst: KAH
Oil and Grease	1.00	U	0.610	1.00	2.00	mg/L	1	02-Mar-2020 14:00
CHEMICAL OXYGEN DEMAND BY E410.4		**Method:E410.4**						Analyst: TH
Chemical Oxygen Demand	**5.00**	J	**5.00**	**15.0**	**15.0**	**mg/L**	1	29-Feb-2020 11:30
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KVL
Chloride	**357**		**2.00**	**5.00**	**5.00**	**mg/L**	10	28-Feb-2020 19:25
Sulfate	**26.0**		**2.00**	**5.00**	**5.00**	**mg/L**	10	28-Feb-2020 19:25
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	12-Mar-2020 09:29

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

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ALS Houston, US Date: 12-Mar-20

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**
Project: Groundwater Treatment Plant Quarterly Influent Samples WorkOrder:HS20021121
Sample ID: Trip Blank Lab ID:HS20021121-02
Collection Date: 25-Feb-2020 00:00 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	26-Feb-2020 13:51
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	26-Feb-2020 13:51
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	26-Feb-2020 13:51
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	26-Feb-2020 13:51
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	26-Feb-2020 13:51
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	26-Feb-2020 13:51
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	26-Feb-2020 13:51
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	26-Feb-2020 13:51
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	26-Feb-2020 13:51
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	26-Feb-2020 13:51
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	26-Feb-2020 13:51
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	26-Feb-2020 13:51
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	26-Feb-2020 13:51
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	26-Feb-2020 13:51
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	26-Feb-2020 13:51
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	26-Feb-2020 13:51
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	26-Feb-2020 13:51
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	26-Feb-2020 13:51
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	26-Feb-2020 13:51
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	26-Feb-2020 13:51
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	26-Feb-2020 13:51
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	26-Feb-2020 13:51
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	26-Feb-2020 13:51
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	26-Feb-2020 13:51
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	26-Feb-2020 13:51
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	26-Feb-2020 13:51
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	26-Feb-2020 13:51
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	26-Feb-2020 13:51
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	26-Feb-2020 13:51
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	26-Feb-2020 13:51
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	26-Feb-2020 13:51
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	26-Feb-2020 13:51
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	26-Feb-2020 13:51
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	26-Feb-2020 13:51
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	26-Feb-2020 13:51
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	26-Feb-2020 13:51
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	26-Feb-2020 13:51
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	26-Feb-2020 13:51
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	26-Feb-2020 13:51

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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 12-Mar-20

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**
Project: Groundwater Treatment Plant Quarterly Influent Samples WorkOrder:HS20021121
Sample ID: Trip Blank Lab ID:HS20021121-02
Collection Date: 25-Feb-2020 00:00 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	26-Feb-2020 13:51
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	26-Feb-2020 13:51
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	26-Feb-2020 13:51
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	26-Feb-2020 13:51
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	26-Feb-2020 13:51
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	26-Feb-2020 13:51
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	26-Feb-2020 13:51
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	26-Feb-2020 13:51
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	26-Feb-2020 13:51
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	26-Feb-2020 13:51
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	26-Feb-2020 13:51
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	26-Feb-2020 13:51
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	26-Feb-2020 13:51
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	26-Feb-2020 13:51
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	26-Feb-2020 13:51
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	26-Feb-2020 13:51
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	26-Feb-2020 13:51
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	26-Feb-2020 13:51
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	26-Feb-2020 13:51
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	26-Feb-2020 13:51
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	26-Feb-2020 13:51
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	26-Feb-2020 13:51
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	26-Feb-2020 13:51
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	26-Feb-2020 13:51
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	26-Feb-2020 13:51
Surr: 1,2-Dichloroethane-d4	*93.3*			**0**	*81-118*	*%REC*	*1*	*26-Feb-2020 13:51*
Surr: 4-Bromofluorobenzene	*104*			**0**	*85-114*	*%REC*	*1*	*26-Feb-2020 13:51*
Surr: Dibromofluoromethane	*93.4*			**0**	*80-119*	*%REC*	*1*	*26-Feb-2020 13:51*
Surr: Toluene-d8	*110*			**0**	*89-112*	*%REC*	*1*	*26-Feb-2020 13:51*

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

RIGHT SOLUTIONS | RIGHT PARTNER

Weight / Prep Log

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Influent Samples
WorkOrder: HS20021121

Batch ID: 151088 **Start Date:** 27 Feb 2020 07:33 **End Date:** 27 Feb 2020 13:00
Method: SV AQ SEP FUN EXTRACT-LOWLEV - 3510C **Prep Code:** 3510_B_SIM

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS20021121-01		1000 (mL)	1 (mL)	0.001

Batch ID: 151244 **Start Date:** 03 Mar 2020 09:16 **End Date:** 03 Mar 2020 13:30
Method: WATER - SW3010A **Prep Code:** 3010A

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS20021121-01		10 (mL)	10 (mL)	1

Batch ID: 151269 **Start Date:** 03 Mar 2020 10:30 **End Date:** 03 Mar 2020 12:30
Method: MERCURY PREP BY 7470A- WATER **Prep Code:** HG_WPR

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS20021121-01		10 (mL)	10 (mL)	1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 12-Mar-20

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Influent Samples
WorkOrder: HS20021121

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: 151088 (0)	**Test Name :** SEMIVOLATILES SIM				**Matrix:** Water	
HS20021121-01	LH18/24-SP140_022520	25 Feb 2020 14:00		27 Feb 2020 07:33	04 Mar 2020 11:01	1
Batch ID: 151244 (0)	**Test Name :** METALS BY ICPMS BY SW6020A				**Matrix:** Water	
HS20021121-01	LH18/24-SP140_022520	25 Feb 2020 14:00		03 Mar 2020 13:30	04 Mar 2020 16:53	1
Batch ID: 151269 (0)	**Test Name :** MERCURY BY SW7470A				**Matrix:** Water	
HS20021121-01	LH18/24-SP140_022520	25 Feb 2020 14:00		03 Mar 2020 10:30	03 Mar 2020 16:04	1
Batch ID: R357105 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Water	
HS20021121-01	LH18/24-SP140_022520	25 Feb 2020 14:00			26 Feb 2020 16:16	20
HS20021121-01	LH18/24-SP140_022520	25 Feb 2020 14:00			26 Feb 2020 15:52	200
HS20021121-02	Trip Blank	25 Feb 2020 00:00			26 Feb 2020 13:51	1
Batch ID: R357300 (0)	**Test Name :** ANIONS BY SW9056A				**Matrix:** Water	
HS20021121-01	LH18/24-SP140_022520	25 Feb 2020 14:00			28 Feb 2020 19:25	10
Batch ID: R357344 (0)	**Test Name :** CHEMICAL OXYGEN DEMAND BY E410.4				**Matrix:** Water	
HS20021121-01	LH18/24-SP140_022520	25 Feb 2020 14:00			29 Feb 2020 11:30	1
Batch ID: R357384 (0)	**Test Name :** OIL & GREASE (HEM) BY E1664A				**Matrix:** Water	
HS20021121-01	LH18/24-SP140_022520	25 Feb 2020 14:00			02 Mar 2020 14:00	1
Batch ID: R357989 (0)	**Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)				**Matrix:** Water	
HS20021121-01	LH18/24-SP140_022520	25 Feb 2020 14:00			12 Mar 2020 09:29	1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 12-Mar-20

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Influent Samples
WorkOrder: HS20021121

QC BATCH REPORT

Batch ID: 151244 (0) **Instrument: ICPMS05** **Method: METALS BY ICPMS BY SW6020A**

MBLK Sample ID: **MBLK-151244** Units: **mg/L** Analysis Date: **04-Mar-2020 16:34**
Client ID: Run ID: **ICPMS05_357567** SeqNo: **5500287** PrepDate: **03-Mar-2020** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.002155	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
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	0.05263	0.200								J
Thallium	0.000500	0.00200								U
Vanadium	0.00100	0.00500								U
Zinc	0.00250	0.00500								U

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 12-Mar-20

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Influent Samples
WorkOrder: HS20021121

QC BATCH REPORT

Batch ID: 151244 (0) **Instrument: ICPMS05** **Method: METALS BY ICPMS BY SW6020A**

LCS Sample ID: **LCS-151244** Units: **mg/L** Analysis Date: **04-Mar-2020 16:36**
Client ID: Run ID: **ICPMS05_357567** SeqNo: **5500288** PrepDate: **03-Mar-2020** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.09852	0.0100	0.1	0	98.5	84 - 117				
Antimony	0.04798	0.00500	0.05	0	96.0	85 - 117				
Arsenic	0.04744	0.00500	0.05	0	94.9	84 - 116				
Barium	0.04832	0.00500	0.05	0	96.6	86 - 114				
Beryllium	0.05018	0.00200	0.05	0	100	83 - 121				
Cadmium	0.0494	0.00200	0.05	0	98.8	87 - 115				
Calcium	4.926	0.500	5	0	98.5	87 - 118				
Chromium	0.04571	0.00500	0.05	0	91.4	85 - 116				
Cobalt	0.04601	0.00500	0.05	0	92.0	86 - 115				
Iron	4.773	0.200	5	0	95.5	87 - 118				
Lead	0.04648	0.00500	0.05	0	93.0	88 - 115				
Magnesium	4.935	0.200	5	0	98.7	83 - 118				
Manganese	0.04603	0.00500	0.05	0	92.1	87 - 115				
Nickel	0.04769	0.00500	0.05	0	95.4	85 - 117				
Potassium	4.873	0.200	5	0	97.5	87 - 115				
Selenium	0.04755	0.00500	0.05	0	95.1	80 - 120				
Silver	0.04605	0.00500	0.05	0	92.1	85 - 116				
Sodium	4.782	0.200	5	0	95.6	85 - 117				
Thallium	0.04389	0.00200	0.05	0	87.8	82 - 116				
Vanadium	0.04599	0.00500	0.05	0	92.0	86 - 115				
Zinc	0.04863	0.00500	0.05	0	97.3	83 - 119				

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 12-Mar-20

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Influent Samples
WorkOrder: HS20021121

QC BATCH REPORT

Batch ID: 151244 (0) **Instrument: ICPMS05** **Method: METALS BY ICPMS BY SW6020A**

MS Sample ID: **HS20021120-01MS** Units: **mg/L** Analysis Date: **04-Mar-2020 16:46**
Client ID: Run ID: **ICPMS05_357567** SeqNo: **5500291** PrepDate: **03-Mar-2020** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.2812	0.0100	0.1	0.1755	106	84 - 117				
Antimony	0.05112	0.00500	0.05	0.000607	101	85 - 117				
Arsenic	0.05267	0.00500	0.05	0.000698	104	84 - 116				
Barium	0.2545	0.00500	0.05	0.197	115	86 - 114				S
Beryllium	0.05764	0.00200	0.05	0.000087	115	83 - 121				
Cadmium	0.05143	0.00200	0.05	0.000317	102	87 - 115				
Calcium	21.39	0.500	5	15.76	113	87 - 118				
Chromium	0.06411	0.00500	0.05	0.01587	96.5	85 - 116				
Cobalt	0.04965	0.00500	0.05	0.002312	94.7	86 - 115				
Iron	5.666	0.200	5	0.7162	99.0	87 - 118				
Lead	0.04845	0.00500	0.05	0.000426	96.0	88 - 115				
Magnesium	24.63	0.200	5	19.24	108	83 - 118				
Manganese	0.1968	0.00500	0.05	0.1485	96.5	87 - 115				
Nickel	0.06229	0.00500	0.05	0.01357	97.4	85 - 117				
Potassium	6.686	0.200	5	1.379	106	87 - 115				
Selenium	0.05163	0.00500	0.05	0.000262	103	80 - 120				
Silver	0.04615	0.00500	0.05	0.000028	92.2	85 - 116				
Sodium	312.6	0.200	5	299.9	253	85 - 117				SEO
Thallium	0.04591	0.00200	0.05	0.000428	91.0	82 - 116				
Vanadium	0.04991	0.00500	0.05	0.000265	99.3	86 - 115				
Zinc	0.3332	0.00500	0.05	0.2817	103	83 - 119				O

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 12-Mar-20

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Influent Samples
WorkOrder: HS20021121

QC BATCH REPORT

Batch ID: 151244 (0) **Instrument: ICPMS05** **Method: METALS BY ICPMS BY SW6020A**

MSD Sample ID: **HS20021120-01MSD** Units: **mg/L** Analysis Date: **04-Mar-2020 16:48**
Client ID: Run ID: **ICPMS05_357567** SeqNo: **5500292** PrepDate: **03-Mar-2020** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.2799	0.0100	0.1	0.1755	104	84 - 117	0.2812	0.459	20	
Antimony	0.05076	0.00500	0.05	0.000607	100	85 - 117	0.05112	0.699	20	
Arsenic	0.05195	0.00500	0.05	0.000698	103	84 - 116	0.05267	1.37	20	
Barium	0.2399	0.00500	0.05	0.197	85.9	86 - 114	0.2545	5.91	20	S
Beryllium	0.05445	0.00200	0.05	0.000087	109	83 - 121	0.05764	5.69	20	
Cadmium	0.04956	0.00200	0.05	0.000317	98.5	87 - 115	0.05143	3.7	20	
Calcium	21.3	0.500	5	15.76	111	87 - 118	21.39	0.415	20	
Chromium	0.06672	0.00500	0.05	0.01587	102	85 - 116	0.06411	4	20	
Cobalt	0.04916	0.00500	0.05	0.002312	93.7	86 - 115	0.04965	0.998	20	
Iron	5.686	0.200	5	0.7162	99.4	87 - 118	5.666	0.359	20	
Lead	0.04901	0.00500	0.05	0.000426	97.2	88 - 115	0.04845	1.15	20	
Magnesium	24.28	0.200	5	19.24	101	83 - 118	24.63	1.44	20	
Manganese	0.1979	0.00500	0.05	0.1485	98.7	87 - 115	0.1968	0.566	20	
Nickel	0.0605	0.00500	0.05	0.01357	93.8	85 - 117	0.06229	2.92	20	
Potassium	6.56	0.200	5	1.379	104	87 - 115	6.686	1.9	20	
Selenium	0.05244	0.00500	0.05	0.000262	104	80 - 120	0.05163	1.55	20	
Silver	0.0443	0.00500	0.05	0.000028	88.6	85 - 116	0.04615	4.09	20	
Sodium	310.1	0.200	5	299.9	203	85 - 117	312.6	0.803	20	SEO
Thallium	0.04672	0.00200	0.05	0.000428	92.6	82 - 116	0.04591	1.76	20	
Vanadium	0.04954	0.00500	0.05	0.000265	98.6	86 - 115	0.04991	0.744	20	
Zinc	0.3374	0.00500	0.05	0.2817	111	83 - 119	0.3332	1.24	20	O

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 12-Mar-20

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Influent Samples
WorkOrder: HS20021121

QC BATCH REPORT

Batch ID: 151244 (0) **Instrument: ICPMS05** **Method: METALS BY ICPMS BY SW6020A**

PDS Sample ID: **HS20021120-01PDS** Units: **mg/L** Analysis Date: **04-Mar-2020 16:51**
Client ID: Run ID: **ICPMS05_357567** SeqNo: **5500293** PrepDate: **03-Mar-2020** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.2853	0.0100	0.1	0.1755	110	80 - 120				
Antimony	0.09716	0.00500	0.1	0.000607	96.6	80 - 120				
Arsenic	0.1126	0.00500	0.1	0.000698	112	80 - 120				
Barium	0.3043	0.00500	0.1	0.197	107	80 - 120				
Beryllium	0.111	0.00200	0.1	0.000087	111	80 - 120				
Cadmium	0.1107	0.00200	0.1	0.000317	110	80 - 120				
Calcium	26.74	0.500	10	15.76	110	80 - 120				
Chromium	0.1205	0.00500	0.1	0.01587	105	80 - 120				
Cobalt	0.107	0.00500	0.1	0.002312	105	80 - 120				
Iron	11.69	0.200	10	0.7162	110	80 - 120				
Lead	0.1051	0.00500	0.1	0.000426	105	80 - 120				
Magnesium	29.89	0.200	10	19.24	107	80 - 120				
Manganese	0.252	0.00500	0.1	0.1485	104	80 - 120				
Nickel	0.1188	0.00500	0.1	0.01357	105	80 - 120				
Potassium	12.72	0.200	10	1.379	113	80 - 120				
Selenium	0.111	0.00500	0.1	0.000262	111	80 - 120				
Silver	0.09132	0.00500	0.1	0.000028	91.3	80 - 120				
Thallium	0.1106	0.00200	0.1	0.000428	110	80 - 120				
Vanadium	0.1093	0.00500	0.1	0.000265	109	80 - 120				
Zinc	0.3889	0.00500	0.1	0.2817	107	80 - 120				

PDS Sample ID: **HS20021120-01PDS** Units: **mg/L** Analysis Date: **05-Mar-2020 13:28**
Client ID: Run ID: **ICPMS06_357609** SeqNo: **5501056** PrepDate: **03-Mar-2020** DF: **20**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sodium	498.7	4.00	200	314	92.4	80 - 120				

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 12-Mar-20

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Influent Samples
WorkOrder: HS20021121

QC BATCH REPORT

Batch ID: 151244 (0) **Instrument: ICPMS05** **Method: METALS BY ICPMS BY SW6020A**

SD Sample ID: **HS20021120-01SD** Units: **mg/L** Analysis Date: **04-Mar-2020 16:41**
Client ID: Run ID: **ICPMS05_357567** SeqNo: **5500290** PrepDate: **03-Mar-2020** 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					0.000607	0	10	U
Arsenic	0.00250	0.0250					0.000698	0	10	U
Barium	0.1916	0.0250					0.197	2.72	10	
Beryllium	0.00250	0.0100					0.000087	0	10	U
Cadmium	0.00250	0.0100					0.000317	0	10	U
Calcium	15.73	2.50					15.76	0.157	10	
Chromium	0.01606	0.0250					0.01587	0	10	J
Cobalt	0.002648	0.0250					0.002312	0	10	J
Iron	0.7028	1.00					0.7162	0	10	J
Lead	0.00500	0.0250					0.000426	0	10	U
Magnesium	19.97	1.00					19.24	3.79	10	
Manganese	0.1512	0.0250					0.1485	1.8	10	
Nickel	0.01453	0.0250					0.01357	0	10	J
Potassium	1.41	1.00					1.379	2.26	10	
Selenium	0.0125	0.0250					0.000262	0	10	U
Silver	0.00250	0.0250					0.000028	0	10	U
Thallium	0.00250	0.0100					0.000428	0	10	U
Vanadium	0.00500	0.0250					0.000265	0	10	U
Zinc	0.2931	0.0250					0.2817	4.06	10	

SD Sample ID: **HS20021120-01SD** Units: **mg/L** Analysis Date: **05-Mar-2020 13:26**
Client ID: Run ID: **ICPMS06_357609** SeqNo: **5501055** PrepDate: **03-Mar-2020** DF: **100**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Sodium	320.9	20.0					314	2.21	10	

The following samples were analyzed in this batch: HS20021121-01

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 12-Mar-20

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Influent Samples
WorkOrder: HS20021121

QC BATCH REPORT

Batch ID: 151269 (0) **Instrument: HG03** **Method: MERCURY BY SW7470A**

MBLK Sample ID: **MBLK-151269** Units: **mg/L** Analysis Date: **03-Mar-2020 15:47**
Client ID: Run ID: **HG03_357455** SeqNo: **5498432** PrepDate: **03-Mar-2020** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.000100	0.000200								U

LCS Sample ID: **LCS-151269** Units: **mg/L** Analysis Date: **03-Mar-2020 15:49**
Client ID: Run ID: **HG03_357455** SeqNo: **5498433** PrepDate: **03-Mar-2020** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00507	0.000200	0.005	0	101	80 - 120				

MS Sample ID: **HS20021310-04MS** Units: **mg/L** Analysis Date: **03-Mar-2020 15:52**
Client ID: Run ID: **HG03_357455** SeqNo: **5498435** PrepDate: **03-Mar-2020** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00504	0.000200	0.005	0.00002100	100	75 - 125				

MSD Sample ID: **HS20021310-04MSD** Units: **mg/L** Analysis Date: **03-Mar-2020 15:54**
Client ID: Run ID: **HG03_357455** SeqNo: **5498436** PrepDate: **03-Mar-2020** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00502	0.000200	0.005	0.00002100	100.0	75 - 125	0.005040	0.398	20	

The following samples were analyzed in this batch: HS20021121-01

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 12-Mar-20

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Influent Samples
WorkOrder: HS20021121

QC BATCH REPORT

Batch ID: 151088 (0) **Instrument: SV-6** **Method: SEMIVOLATILES SIM**

MBLK Sample ID: **MBLK-151088** Units: **ug/L** Analysis Date: **04-Mar-2020 08:42**
Client ID: Run ID: **SV-6_357520** SeqNo: **5499122** PrepDate: **27-Feb-2020** 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	*0.09136*	*0*	*0.08*	*0*	*114*	*40 - 140*				
Surr: 4-Terphenyl-d14	*0.0905*	*0*	*0.08*	*0*	*113*	*40 - 140*				
Surr: Nitrobenzene-d5	*0.1007*	*0*	*0.08*	*0*	*126*	*40 - 140*				

LCS Sample ID: **LCS-151088** Units: **ug/L** Analysis Date: **04-Mar-2020 09:01**
Client ID: Run ID: **SV-6_357520** SeqNo: **5499123** PrepDate: **27-Feb-2020** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,4-Dioxane	0.08192	0.010	0.08	0	102	40 - 140				
Surr: 2-Fluorobiphenyl	*0.07618*	*0*	*0.08*	*0*	*95.2*	*40 - 140*				
Surr: 4-Terphenyl-d14	*0.07633*	*0*	*0.08*	*0*	*95.4*	*40 - 140*				
Surr: Nitrobenzene-d5	*0.08266*	*0*	*0.08*	*0*	*103*	*40 - 140*				

LCSD Sample ID: **LCSD-151088** Units: **ug/L** Analysis Date: **04-Mar-2020 09:42**
Client ID: Run ID: **SV-6_357520** SeqNo: **5499124** PrepDate: **27-Feb-2020** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,4-Dioxane	0.08911	0.010	0.08	0	111	40 - 140	0.08192	8.41	20	
Surr: 2-Fluorobiphenyl	*0.09498*	*0*	*0.08*	*0*	*119*	*40 - 140*	*0.07618*	*22*	*20*	R
Surr: 4-Terphenyl-d14	*0.09753*	*0*	*0.08*	*0*	*122*	*40 - 140*	*0.07633*	*24.4*	*20*	R
Surr: Nitrobenzene-d5	*0.09804*	*0*	*0.08*	*0*	*123*	*40 - 140*	*0.08266*	*17*	*20*	

The following samples were analyzed in this batch: HS20021121-01

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 12-Mar-20

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Influent Samples
WorkOrder: HS20021121

QC BATCH REPORT

Batch ID: R357105 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-200226** Units: **UG/L** Analysis Date: **26-Feb-2020 13:03**
Client ID: Run ID: **VOA6_357105** SeqNo: **5489751** 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

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 12-Mar-20

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Influent Samples
WorkOrder: HS20021121

QC BATCH REPORT

Batch ID: R357105 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-200226** Units: **UG/L** Analysis Date: **26-Feb-2020 13:03**
Client ID: Run ID: **VOA6_357105** SeqNo: **5489751** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	1.0	2.0								U
Carbon tetrachloride	0.50	1.0								U
Chlorobenzene	0.50	1.0								U
Chloroethane	0.50	1.0								U
Chloroform	0.50	1.0								U
Chloromethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
cis-1,3-Dichloropropene	0.50	1.0								U
Dibromochloromethane	0.50	1.0								U
Dibromomethane	0.50	1.0								U
Dichlorodifluoromethane	0.50	1.0								U
Ethylbenzene	0.50	1.0								U
Hexachlorobutadiene	1.0	1.0								U
Isopropylbenzene	0.50	1.0								U
m,p-Xylene	1.0	2.0								U
Methylene chloride	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	*47.31*	*1.0*	*50*	*0*	*94.6*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*51.87*	*1.0*	*50*	*0*	*104*	*85 - 114*				
Surr: Dibromofluoromethane	*46.68*	*1.0*	*50*	*0*	*93.4*	*80 - 119*				
Surr: Toluene-d8	*54.99*	*1.0*	*50*	*0*	*110*	*89 - 112*				

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 12-Mar-20

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Influent Samples
WorkOrder: HS20021121

QC BATCH REPORT

Batch ID: R357105 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

LCS Sample ID: **VLCSW-200226** Units: **UG/L** Analysis Date: **26-Feb-2020 12:15**
Client ID: Run ID: **VOA6_357105** SeqNo: **5489750** 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	21.39	1.0	20	0	107	74 - 131				
1,1,2,2-Tetrachloroethane	17.82	1.0	20	0	89.1	71 - 121				
1,1,2-Trichloroethane	19.64	1.0	20	0	98.2	80 - 119				
1,1-Dichloroethane	18.56	1.0	20	0	92.8	77 - 125				
1,1-Dichloroethene	17.09	1.0	20	0	85.5	71 - 131				
1,1-Dichloropropene	19.6	1.0	20	0	98.0	78 - 125				
1,2,3-Trichlorobenzene	17.74	1.0	20	0	88.7	69 - 129				
1,2,3-Trichloropropane	18	1.0	20	0	90.0	73 - 122				
1,2,4-Trichlorobenzene	16.31	1.0	20	0	81.6	69 - 130				
1,2,4-Trimethylbenzene	20	1.0	20	0	100	76 - 124				
1,2-Dibromo-3-chloropropane	18.25	1.0	20	0	91.2	62 - 128				
1,2-Dibromoethane	20.35	1.0	20	0	102	77 - 121				
1,2-Dichlorobenzene	19.21	1.0	20	0	96.0	80 - 119				
1,2-Dichloroethane	21.23	1.0	20	0	106	73 - 128				
1,2-Dichloropropane	18.17	1.0	20	0	90.8	78 - 122				
1,3,5-Trimethylbenzene	19.19	1.0	20	0	96.0	75 - 124				
1,3-Dichlorobenzene	19.59	1.0	20	0	97.9	80 - 119				
1,3-Dichloropropane	19.5	1.0	20	0	97.5	80 - 119				
1,4-Dichlorobenzene	19.32	1.0	20	0	96.6	79 - 118				
2,2-Dichloropropane	21.17	1.0	20	0	106	60 - 139				
2-Butanone	38.42	2.0	40	0	96.0	56 - 143				
2-Chlorotoluene	19.19	1.0	20	0	96.0	79 - 122				
2-Hexanone	39.67	2.0	40	0	99.2	57 - 139				
4-Chlorotoluene	18.24	1.0	20	0	91.2	78 - 122				
4-Isopropyltoluene	19.32	1.0	20	0	96.6	77 - 127				
4-Methyl-2-pentanone	39.09	2.0	40	0	97.7	67 - 130				
Acetone	48.28	2.0	40	0	121	39 - 160				
Benzene	18.96	1.0	20	0	94.8	79 - 120				
Bromobenzene	19.63	1.0	20	0	98.2	80 - 120				
Bromochloromethane	19.51	1.0	20	0	97.6	78 - 123				
Bromodichloromethane	20.76	1.0	20	0	104	79 - 125				
Bromoform	22.06	1.0	20	0	110	66 - 130				
Bromomethane	20.59	1.0	20	0	103	53 - 141				

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 12-Mar-20

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Influent Samples
WorkOrder: HS20021121

QC BATCH REPORT

Batch ID: R357105 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

LCS Sample ID: **VLCSW-200226** Units: **UG/L** Analysis Date: **26-Feb-2020 12:15**
Client ID: Run ID: **VOA6_357105** SeqNo: **5489750** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	35.85	2.0	40	0	89.6	64 - 133				
Carbon tetrachloride	20.92	1.0	20	0	105	72 - 136				
Chlorobenzene	19.76	1.0	20	0	98.8	82 - 118				
Chloroethane	17.78	1.0	20	0	88.9	60 - 138				
Chloroform	18.88	1.0	20	0	94.4	79 - 124				
Chloromethane	16.84	1.0	20	0	84.2	50 - 139				
cis-1,2-Dichloroethene	18.75	1.0	20	0	93.7	78 - 123				
cis-1,3-Dichloropropene	19.83	1.0	20	0	99.2	75 - 124				
Dibromochloromethane	21.45	1.0	20	0	107	74 - 126				
Dibromomethane	20.1	1.0	20	0	100	79 - 123				
Dichlorodifluoromethane	18.57	1.0	20	0	92.9	32 - 152				
Ethylbenzene	19.99	1.0	20	0	100.0	79 - 121				
Hexachlorobutadiene	19	1.0	20	0	95.0	66 - 134				
Isopropylbenzene	21.07	1.0	20	0	105	72 - 131				
m,p-Xylene	40.3	2.0	40	0	101	80 - 121				
Methylene chloride	18.12	2.0	20	0	90.6	74 - 124				
Naphthalene	16.38	1.0	20	0	81.9	61 - 128				
n-Butylbenzene	18.54	1.0	20	0	92.7	75 - 128				
n-Propylbenzene	19.7	1.0	20	0	98.5	76 - 126				
o-Xylene	20.39	1.0	20	0	102	78 - 122				
sec-Butylbenzene	19.69	1.0	20	0	98.4	77 - 126				
Styrene	20.67	1.0	20	0	103	78 - 123				
tert-Butylbenzene	20.31	1.0	20	0	102	78 - 124				
Tetrachloroethene	21.9	1.0	20	0	109	74 - 129				
Toluene	20.07	1.0	20	0	100	80 - 121				
trans-1,2-Dichloroethene	19.17	1.0	20	0	95.8	75 - 124				
trans-1,3-Dichloropropene	20.15	1.0	20	0	101	73 - 127				
Trichloroethene	20.43	1.0	20	0	102	79 - 123				
Trichlorofluoromethane	21.66	1.0	20	0	108	65 - 141				
Vinyl chloride	16.89	1.0	20	0	84.4	58 - 137				
Surr: 1,2-Dichloroethane-d4	*51.11*	*1.0*	*50*	*0*	*102*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*45.89*	*1.0*	*50*	*0*	*91.8*	*85 - 114*				
Surr: Dibromofluoromethane	*47.6*	*1.0*	*50*	*0*	*95.2*	*80 - 119*				
Surr: Toluene-d8	*47.84*	*1.0*	*50*	*0*	*95.7*	*89 - 112*				

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 12-Mar-20

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Influent Samples
WorkOrder: HS20021121

QC BATCH REPORT

Batch ID: R357105 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MS Sample ID: **HS20021120-01MS** Units: **UG/L** Analysis Date: **26-Feb-2020 16:40**
Client ID: Run ID: **VOA6_357105** SeqNo: **5489757** 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	22.59	1.0	20	0	113	78 - 124				
1,1,1-Trichloroethane	20.42	1.0	20	0	102	74 - 131				
1,1,2,2-Tetrachloroethane	18.09	1.0	20	0	90.4	71 - 121				
1,1,2-Trichloroethane	20.18	1.0	20	0	101	80 - 119				
1,1-Dichloroethane	17.45	1.0	20	0	87.2	77 - 125				
1,1-Dichloroethene	17.95	1.0	20	0	89.7	71 - 131				
1,1-Dichloropropene	20.07	1.0	20	0	100	78 - 125				
1,2,3-Trichlorobenzene	11.56	1.0	20	0	57.8	69 - 129				S
1,2,3-Trichloropropane	20.23	1.0	20	0	101	73 - 122				
1,2,4-Trichlorobenzene	11.94	1.0	20	0	59.7	69 - 130				S
1,2,4-Trimethylbenzene	21.87	1.0	20	0	109	76 - 124				
1,2-Dibromo-3-chloropropane	12.73	1.0	20	0	63.6	62 - 128				
1,2-Dibromoethane	19.36	1.0	20	0	96.8	77 - 121				
1,2-Dichlorobenzene	19.11	1.0	20	0	95.5	80 - 119				
1,2-Dichloroethane	21.31	1.0	20	1.194	101	73 - 128				
1,2-Dichloropropane	17.69	1.0	20	0	88.4	78 - 122				
1,3,5-Trimethylbenzene	25.22	1.0	20	0	126	75 - 124				S
1,3-Dichlorobenzene	19.92	1.0	20	0	99.6	80 - 119				
1,3-Dichloropropane	19.95	1.0	20	0	99.8	80 - 119				
1,4-Dichlorobenzene	20.76	1.0	20	0	104	79 - 118				
2,2-Dichloropropane	19.09	1.0	20	0	95.4	60 - 139				
2-Butanone	27.96	2.0	40	0	69.9	56 - 143				
2-Chlorotoluene	24.55	1.0	20	0	123	79 - 122				S
2-Hexanone	35.6	2.0	40	0	89.0	57 - 139				
4-Chlorotoluene	24.22	1.0	20	0	121	78 - 122				
4-Isopropyltoluene	21.06	1.0	20	0	105	77 - 127				
4-Methyl-2-pentanone	38.1	2.0	40	0	95.3	67 - 130				
Acetone	28.06	2.0	40	0	70.2	39 - 160				
Benzene	18.72	1.0	20	0	93.6	79 - 120				
Bromobenzene	24.53	1.0	20	0	123	80 - 120				S
Bromochloromethane	17.72	1.0	20	0	88.6	78 - 123				
Bromodichloromethane	19.99	1.0	20	0	100.0	79 - 125				
Bromoform	20.41	1.0	20	0	102	66 - 130				
Bromomethane	17.29	1.0	20	0	86.5	53 - 141				

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 12-Mar-20

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Influent Samples
WorkOrder: HS20021121

QC BATCH REPORT

Batch ID: R357105 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MS Sample ID: **HS20021120-01MS** Units: **UG/L** Analysis Date: **26-Feb-2020 16:40**
Client ID: Run ID: **VOA6_357105** SeqNo: **5489757** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	35.28	2.0	40	0	88.2	64 - 133				
Carbon tetrachloride	21.2	1.0	20	0	106	72 - 136				
Chlorobenzene	20.93	1.0	20	0	105	82 - 118				
Chloroethane	21.06	1.0	20	0	105	60 - 138				
Chloroform	17.53	1.0	20	0	87.7	79 - 124				
Chloromethane	16.33	1.0	20	0	81.6	50 - 139				
cis-1,2-Dichloroethene	40.57	1.0	20	22.73	89.2	78 - 123				
cis-1,3-Dichloropropene	18.8	1.0	20	0	94.0	75 - 124				
Dibromochloromethane	21.22	1.0	20	0	106	74 - 126				
Dibromomethane	18.63	1.0	20	0	93.2	79 - 123				
Dichlorodifluoromethane	17.84	1.0	20	0	89.2	32 - 152				
Ethylbenzene	22.1	1.0	20	0	111	79 - 121				
Hexachlorobutadiene	13.17	1.0	20	0	65.8	66 - 134				S
Isopropylbenzene	23.03	1.0	20	0	115	72 - 131				
m,p-Xylene	44.83	2.0	40	0	112	80 - 121				
Methylene chloride	17.68	2.0	20	0	88.4	74 - 124				
Naphthalene	11.59	1.0	20	0	57.9	61 - 128				S
n-Butylbenzene	19.04	1.0	20	0	95.2	75 - 128				
n-Propylbenzene	25.4	1.0	20	0	127	76 - 126				S
o-Xylene	22.51	1.0	20	0	113	78 - 122				
sec-Butylbenzene	21.65	1.0	20	0	108	77 - 126				
Styrene	22	1.0	20	0	110	78 - 123				
tert-Butylbenzene	22.64	1.0	20	0	113	78 - 124				
Tetrachloroethene	24.82	1.0	20	0	124	74 - 129				
Toluene	22.17	1.0	20	0	111	80 - 121				
trans-1,2-Dichloroethene	18.05	1.0	20	0	90.3	75 - 124				
trans-1,3-Dichloropropene	18.71	1.0	20	0	93.5	73 - 127				
Trichloroethene	26.16	1.0	20	4.868	106	79 - 123				
Trichlorofluoromethane	19.59	1.0	20	0	98.0	65 - 141				
Vinyl chloride	16.76	1.0	20	0	83.8	58 - 137				
Surr: 1,2-Dichloroethane-d4	*48.98*	*1.0*	*50*	*0*	*98.0*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*52.71*	*1.0*	*50*	*0*	*105*	*85 - 114*				
Surr: Dibromofluoromethane	*46.76*	*1.0*	*50*	*0*	*93.5*	*80 - 119*				
Surr: Toluene-d8	*57.53*	*1.0*	*50*	*0*	*115*	*89 - 112*				S

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 12-Mar-20

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Influent Samples
WorkOrder: HS20021121

QC BATCH REPORT

Batch ID: R357105 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MSD Sample ID: **HS20021120-01MSD** Units: **UG/L** Analysis Date: **26-Feb-2020 17:28**
Client ID: Run ID: **VOA6_357105** SeqNo: **5489758** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	21.4	1.0	20	0	107	78 - 124	22.59	5.4	20	
1,1,1-Trichloroethane	18.83	1.0	20	0	94.2	74 - 131	20.42	8.07	20	
1,1,2,2-Tetrachloroethane	18.29	1.0	20	0	91.4	71 - 121	18.09	1.11	20	
1,1,2-Trichloroethane	19.6	1.0	20	0	98.0	80 - 119	20.18	2.91	20	
1,1-Dichloroethane	16.3	1.0	20	0	81.5	77 - 125	17.45	6.79	20	
1,1-Dichloroethene	16.05	1.0	20	0	80.3	71 - 131	17.95	11.1	20	
1,1-Dichloropropene	18.4	1.0	20	0	92.0	78 - 125	20.07	8.69	20	
1,2,3-Trichlorobenzene	18.57	1.0	20	0	92.8	69 - 129	11.56	46.6	20	R
1,2,3-Trichloropropane	19.85	1.0	20	0	99.2	73 - 122	20.23	1.92	20	
1,2,4-Trichlorobenzene	16.6	1.0	20	0	83.0	69 - 130	11.94	32.6	20	R
1,2,4-Trimethylbenzene	21.88	1.0	20	0	109	76 - 124	21.87	0.0497	20	
1,2-Dibromo-3-chloropropane	16.1	1.0	20	0	80.5	62 - 128	12.73	23.4	20	R
1,2-Dibromoethane	20.85	1.0	20	0	104	77 - 121	19.36	7.39	20	
1,2-Dichlorobenzene	20.42	1.0	20	0	102	80 - 119	19.11	6.61	20	
1,2-Dichloroethane	21.3	1.0	20	1.194	101	73 - 128	21.31	0.0455	20	
1,2-Dichloropropane	17.11	1.0	20	0	85.5	78 - 122	17.69	3.35	20	
1,3,5-Trimethylbenzene	23.62	1.0	20	0	118	75 - 124	25.22	6.54	20	
1,3-Dichlorobenzene	21.16	1.0	20	0	106	80 - 119	19.92	5.99	20	
1,3-Dichloropropane	19.27	1.0	20	0	96.4	80 - 119	19.95	3.46	20	
1,4-Dichlorobenzene	20.82	1.0	20	0	104	79 - 118	20.76	0.306	20	
2,2-Dichloropropane	17.34	1.0	20	0	86.7	60 - 139	19.09	9.61	20	
2-Butanone	30.5	2.0	40	0	76.3	56 - 143	27.96	8.71	20	
2-Chlorotoluene	22.18	1.0	20	0	111	79 - 122	24.55	10.2	20	
2-Hexanone	37.89	2.0	40	0	94.7	57 - 139	35.6	6.24	20	
4-Chlorotoluene	22.59	1.0	20	0	113	78 - 122	24.22	6.94	20	
4-Isopropyltoluene	20.97	1.0	20	0	105	77 - 127	21.06	0.46	20	
4-Methyl-2-pentanone	37.67	2.0	40	0	94.2	67 - 130	38.1	1.15	20	
Acetone	29.97	2.0	40	0	74.9	39 - 160	28.06	6.58	20	
Benzene	18.05	1.0	20	0	90.2	79 - 120	18.72	3.67	20	
Bromobenzene	21.83	1.0	20	0	109	80 - 120	24.53	11.6	20	
Bromochloromethane	16.66	1.0	20	0	83.3	78 - 123	17.72	6.13	20	
Bromodichloromethane	19.75	1.0	20	0	98.7	79 - 125	19.99	1.24	20	
Bromoform	19.42	1.0	20	0	97.1	66 - 130	20.41	4.99	20	
Bromomethane	17.15	1.0	20	0	85.8	53 - 141	17.29	0.82	20	

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 12-Mar-20

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Influent Samples
WorkOrder: HS20021121

QC BATCH REPORT

Batch ID: R357105 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MSD Sample ID: **HS20021120-01MSD** Units: **UG/L** Analysis Date: **26-Feb-2020 17:28**
Client ID: Run ID: **VOA6_357105** SeqNo: **5489758** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Carbon disulfide	26.85	2.0	40	0	67.1	64 - 133	35.28	27.2	20	R
Carbon tetrachloride	19.96	1.0	20	0	99.8	72 - 136	21.2	6.01	20	
Chlorobenzene	19.36	1.0	20	0	96.8	82 - 118	20.93	7.81	20	
Chloroethane	18.66	1.0	20	0	93.3	60 - 138	21.06	12.1	20	
Chloroform	16.5	1.0	20	0	82.5	79 - 124	17.53	6.07	20	
Chloromethane	13.58	1.0	20	0	67.9	50 - 139	16.33	18.3	20	
cis-1,2-Dichloroethene	38.28	1.0	20	22.73	77.7	78 - 123	40.57	5.82	20	S
cis-1,3-Dichloropropene	18.43	1.0	20	0	92.1	75 - 124	18.8	1.99	20	
Dibromochloromethane	21.46	1.0	20	0	107	74 - 126	21.22	1.13	20	
Dibromomethane	19.28	1.0	20	0	96.4	79 - 123	18.63	3.42	20	
Dichlorodifluoromethane	15.45	1.0	20	0	77.2	32 - 152	17.84	14.4	20	
Ethylbenzene	19.49	1.0	20	0	97.5	79 - 121	22.1	12.5	20	
Hexachlorobutadiene	16.4	1.0	20	0	82.0	66 - 134	13.17	21.9	20	R
Isopropylbenzene	20.24	1.0	20	0	101	72 - 131	23.03	12.9	20	
m,p-Xylene	40.44	2.0	40	0	101	80 - 121	44.83	10.3	20	
Methylene chloride	14.32	2.0	20	0	71.6	74 - 124	17.68	21	20	SR
Naphthalene	18.11	1.0	20	0	90.5	61 - 128	11.59	43.9	20	R
n-Butylbenzene	19.65	1.0	20	0	98.2	75 - 128	19.04	3.15	20	
n-Propylbenzene	23.09	1.0	20	0	115	76 - 126	25.4	9.52	20	
o-Xylene	20.2	1.0	20	0	101	78 - 122	22.51	10.8	20	
sec-Butylbenzene	21.99	1.0	20	0	110	77 - 126	21.65	1.56	20	
Styrene	19.82	1.0	20	0	99.1	78 - 123	22	10.4	20	
tert-Butylbenzene	22.8	1.0	20	0	114	78 - 124	22.64	0.688	20	
Tetrachloroethene	22.22	1.0	20	0	111	74 - 129	24.82	11.1	20	
Toluene	20.06	1.0	20	0	100	80 - 121	22.17	10	20	
trans-1,2-Dichloroethene	14.31	1.0	20	0	71.6	75 - 124	18.05	23.1	20	SR
trans-1,3-Dichloropropene	19.24	1.0	20	0	96.2	73 - 127	18.71	2.84	20	
Trichloroethene	23.8	1.0	20	4.868	94.7	79 - 123	26.16	9.42	20	
Trichlorofluoromethane	18.85	1.0	20	0	94.3	65 - 141	19.59	3.84	20	
Vinyl chloride	14.4	1.0	20	0	72.0	58 - 137	16.76	15.2	20	
Surr: 1,2-Dichloroethane-d4	*46.67*	*1.0*	*50*	*0*	*93.3*	*81 - 118*	*48.98*	*4.83*	*20*	
Surr: 4-Bromofluorobenzene	*48.14*	*1.0*	*50*	*0*	*96.3*	*85 - 114*	*52.71*	*9.05*	*20*	
Surr: Dibromofluoromethane	*47.13*	*1.0*	*50*	*0*	*94.3*	*80 - 119*	*46.76*	*0.787*	*20*	
Surr: Toluene-d8	*55.4*	*1.0*	*50*	*0*	*111*	*89 - 112*	*57.53*	*3.77*	*20*	

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 12-Mar-20

Client:	Bhate Environmental Associates, Inc.
Project:	Groundwater Treatment Plant Quarterly Influent Samples
WorkOrder:	HS20021121

QC BATCH REPORT

Batch ID:	**R357105 (0)**	**Instrument:**	**VOA6**	**Method:**	**VOLATILES ORGANICS BY METHOD 8260C**

The following samples were analyzed in this batch: HS20021121-01 HS20021121-02

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ALS Houston, US Date: 12-Mar-20

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Influent Samples
WorkOrder: HS20021121

QC BATCH REPORT

Batch ID: R357300 (0) **Instrument: ICS2100** **Method: ANIONS BY SW9056A**

MBLK Sample ID: **WBLKW2-022820** Units: **mg/L** Analysis Date: **28-Feb-2020 11:50**
Client ID: Run ID: **ICS2100_357300** SeqNo: **5493858** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	0.500	0.500								U
Sulfate	0.500	0.500								U

LCS Sample ID: **WLCSW2-022820** Units: **mg/L** Analysis Date: **28-Feb-2020 12:04**
Client ID: Run ID: **ICS2100_357300** SeqNo: **5493859** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	20.12	0.500	20	0	101	80 - 120				
Sulfate	19.9	0.500	20	0	99.5	80 - 120				

LCSD Sample ID: **WLCSDW2-022820** Units: **mg/L** Analysis Date: **28-Feb-2020 12:19**
Client ID: Run ID: **ICS2100_357300** SeqNo: **5493860** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	20.02	0.500	20	0	100	80 - 120	20.12	0.493	20	
Sulfate	19.87	0.500	20	0	99.4	80 - 120	19.9	0.136	20	

MS Sample ID: **HS20021016-01MS** Units: **mg/L** Analysis Date: **28-Feb-2020 17:57**
Client ID: Run ID: **ICS2100_357300** SeqNo: **5493902** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	65.44	0.500	10	56.88	85.6	80 - 120				O
Sulfate	33.7	0.500	10	24.68	90.1	80 - 120				

MS Sample ID: **HS20020939-01MS** Units: **mg/L** Analysis Date: **28-Feb-2020 12:48**
Client ID: Run ID: **ICS2100_357300** SeqNo: **5493862** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	125.7	0.500	10	117.6	81.0	80 - 120				EO
Sulfate	47.93	0.500	10	38.9	90.3	80 - 120				

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ALS Houston, US Date: 12-Mar-20

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Influent Samples
WorkOrder: HS20021121

QC BATCH REPORT

Batch ID: R357300 (0) **Instrument: ICS2100** **Method: ANIONS BY SW9056A**

MSD Sample ID: **HS20021016-01MSD** Units: **mg/L** Analysis Date: **28-Feb-2020 18:11**
Client ID: Run ID: **ICS2100_357300** SeqNo: **5493903** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	66.45	0.500	10	56.88	95.7	80 - 120	65.44	1.53	20	O
Sulfate	34	0.500	10	24.68	93.2	80 - 120	33.7	0.904	20	

MSD Sample ID: **HS20020939-01MSD** Units: **mg/L** Analysis Date: **28-Feb-2020 13:03**
Client ID: Run ID: **ICS2100_357300** SeqNo: **5493863** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	126.1	0.500	10	117.6	85.2	80 - 120	125.7	0.341	20	EO
Sulfate	48.29	0.500	10	38.9	93.9	80 - 120	47.93	0.74	20	

The following samples were analyzed in this batch: HS20021121-01

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ALS Houston, US Date: 12-Mar-20

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Influent Samples
WorkOrder: HS20021121

QC BATCH REPORT

Batch ID: R357344 (0) **Instrument: WetChem_HS** **Method: CHEMICAL OXYGEN DEMAND BY E410.4**

MBLK Sample ID: **MBLK-R357344** Units: **mg/L** Analysis Date: **29-Feb-2020 11:30**
Client ID: Run ID: **WetChem_HS_357344** SeqNo: **5495015** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chemical Oxygen Demand	15.0	15.0								U

LCS Sample ID: **LCS-R357344** Units: **mg/L** Analysis Date: **29-Feb-2020 11:30**
Client ID: Run ID: **WetChem_HS_357344** SeqNo: **5495014** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chemical Oxygen Demand	102	15.0	100	0	102	85 - 115				

MS Sample ID: **HS20021113-02MS** Units: **mg/L** Analysis Date: **29-Feb-2020 11:30**
Client ID: Run ID: **WetChem_HS_357344** SeqNo: **5495017** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chemical Oxygen Demand	50	15.0	50	4	92.0	80 - 120				

MSD Sample ID: **HS20021113-02MSD** Units: **mg/L** Analysis Date: **29-Feb-2020 11:30**
Client ID: Run ID: **WetChem_HS_357344** SeqNo: **5495016** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chemical Oxygen Demand	52	15.0	50	4	96.0	80 - 120	50	3.92	20	

The following samples were analyzed in this batch: HS20021121-01

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ALS Houston, US Date: 12-Mar-20

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Influent Samples
WorkOrder: HS20021121

QC BATCH REPORT

Batch ID: R357384 (0) **Instrument: Balance1** **Method: OIL & GREASE (HEM) BY E1664A**

MBLK Sample ID: **WBLKW-030220** Units: **mg/L** Analysis Date: **02-Mar-2020 14:00**
Client ID: Run ID: **Balance1_357384** SeqNo: **5495870** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Oil and Grease	1.00	2.00								U

LCS Sample ID: **WLCSW-030220** Units: **mg/L** Analysis Date: **02-Mar-2020 14:00**
Client ID: Run ID: **Balance1_357384** SeqNo: **5495872** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Oil and Grease	38.4	2.00	40	0	96.0	78 - 114				

LCSD Sample ID: **WLCSDW-030220** Units: **mg/L** Analysis Date: **02-Mar-2020 14:00**
Client ID: Run ID: **Balance1_357384** SeqNo: **5495871** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Oil and Grease	37.6	2.00	40	0	94.0	78 - 114	38.4	2.11	18	

MS Sample ID: **HS20021197-01MS** Units: **mg/L** Analysis Date: **02-Mar-2020 14:00**
Client ID: Run ID: **Balance1_357384** SeqNo: **5495869** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Oil and Grease	37.5	2.00	40	1.25	90.6	78 - 114				

The following samples were analyzed in this batch: HS20021121-01

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ALS Houston, US Date: 12-Mar-20

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Influent Samples
WorkOrder: **HS20021121**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

Unit Reported	Description
mg/L	Milligrams per Liter

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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 V009	22-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	624-2020	31-Dec-2020
North Dakota	R-193 2019-2020	30-Apr-2020
Oklahoma	2019-067	31-Aug-2020
Texas	T104704231-19-25	30-Apr-2020

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ALS Houston, US Date: 12-Mar-20

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Influent Samples
Work Order: HS20021121

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS20021121-01	LH18/24-SP140_022520	Login	2/26/2020 12:11:37 PM	JRM	WET396
HS20021121-01	LH18/24-SP140_022520	Login	2/26/2020 12:11:37 PM	JRM	EXT154
HS20021121-01	LH18/24-SP140_022520	Login	2/26/2020 12:11:37 PM	JRM	WET396
HS20021121-01	LH18/24-SP140_022520	Login	2/26/2020 12:11:37 PM	JRM	WET396
HS20021121-01	LH18/24-SP140_022520	Login	2/26/2020 12:11:37 PM	JRM	MET079
HS20021121-01	LH18/24-SP140_022520	Login	2/26/2020 12:11:37 PM	JRM	VOA001
HS20021121-02	Trip Blank	Login	2/26/2020 12:11:37 PM	JRM	VOA001

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ALS Houston, US Date: 12-Mar-20

Sample Receipt Checklist

Client Name: Bhate Environmental
Work Order: HS20021121
Date/Time Received: **26-Feb-2020 09:00**
Received by: **AC**

Checklist completed by: *Jared R. Makan* eSignature 26-Feb-2020 Date
Reviewed by: *RJ Modashia* eSignature 26-Feb-2020 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):	1.6°C/1.6°C UC/C	IR25
Cooler(s)/Kit(s):	45565	
Date/Time sample(s) sent to storage:	02/26/2020 12:10	

Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

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CHAIN OF CUSTODY

Name Of Lab Shipping To: ALS 10450 Stancliff Rd., Suite 210 Houston, Tx. 77099 ATTN: RJ Modashia

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

Project No. NWO1312.0150.0 16.0001

Job:
GROUNDWATER TREATMENT PLANT QUARTERLY INFLUENT SAMPLES

Prepared By: Scott Beesinger

P. O. Number

Field Sample I.D.	Sample Matrix	Date / Time	MS / MSD	No. OF CONTAINERS	Analyses: ROD Volatiles	Total Metals	Oil & Grease	Chemical Oxygen Demand	Chloride & Sulfate	1, 4 - DIOXANE	Perchlorate				Remarks (Preservatives, etc.)	Lab I.D.#
LH18/24-SP140_022520	Water	02/25/20 / 14:00		4	3		1								HCL	
LH18/24-SP140_022520	Water	02/25/20 / 14:00		1		1									HNO3	
LH18/24-SP140_022520	Water	02/25/20 / 14:00		2					1	1					NONE	
LH18/24-SP140_022520	Water	02/25/20 / 14:00		1				1							H2SO4	
LH18/24-SP140_022520	Water	02/25/20 / 14:00		1							1				NONE	
Trip Blank	Water	02/25/20		2	2										HCL	

Additional Remarks: **STANDARD TURN AROUND TIME**

Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
Scott Beesinger	02/25/20	14:30	AC	2/26/2020	09:00						

For Lab Use Only

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

Remarks: C/C 1.6 IR#25 CF0.0 45565

HS20021121
Bhate Environmental Associates, Inc.
Groundwater Treatment Plant Quarterly Influent Sam

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

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March 11, 2020 Service Request No:E2000179

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

Laboratory Results for: HS20021121

Dear RJ,

Enclosed are the results of the sample(s) submitted to our laboratory February 26, 2020
For your reference, these analyses have been assigned our service request number **E2000179.**

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current TNI standards, where applicable, and except as noted in the laboratory case narrative provided. All results are intended to be considered in their entirety and ALS Environmental is not responsible for use of less than the complete final report. Results apply only to the items submitted to the laboratory, as received for analysis. In accordance with the current TNI Standard, a statement on the estimated uncertainty of measurement of any quantitative analysis will be supplied upon request.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental



Corey Grandits
Project Manager

ADDRESS 10450 Stancliff Rd., Suite 210, Houston, TX 77099
PHONE +1 281 530 5656 | FAX +1 281 530 5887
ALS Group USA, Corp.
dba ALS Environmental

Certificate of Analysis

ALS Environmental - Houston HRMS
10450 Stancliff Rd, Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

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ALS Environmental

Client:	ALS Houston	**Service Request No.:**	E2000179
Project:	HS20021121	**Date Received:**	02/26/20
Sample Matrix:	W		

CASE NARRATIVE

All analyses were performed in adherence to the quality assurance program of ALS Environmental. This report contains analytical results for samples designated for Tier IV. When appropriate to the method, method blank results have been reported with each analytical test.

Sample Receipt

One sample was received for analysis at ALS Environmental in Houston on 02/26/20.

The sample was received in good condition and is consistent with the accompanying chain of custody form. The sample was stored in a refrigerator at 4°C upon receipt at the laboratory.

Data Validation Notes and Discussion

Precision and Accuracy:

EQ2000089: Laboratory Control Spike/Duplicate Laboratory Control Spike (LCS/DLCS) samples were analyzed and reported in lieu of a MS/MSD for this extraction batch. The LCS and DLCS recoveries are within QC limits.

Certification is held for DoD for the method/matrix/analytes provided in this report.

The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and ALS Environmental (ALS) is not responsible for utilization of less than the complete report.

Use of ALS group USA Corp dba ALS Environmental (ALS)'s Name. Client shall not use ALS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to ALS any test result, tolerance or specification derived from ALS's data ("Attribution") without ALS's prior written consent, which may be withheld by ALS for any reason in its sole discretion. To request ALS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If ALS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use ALS's name or trademark in any Materials or Attribution shall be deemed denied. ALS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of ALS's name or trademark may cause ALS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.

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Client: ALS Environmental - US **Service Request:**E2000179
Project: HS20021121

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
E2000179-001	LH18/24-SP140_022520	2/25/2020	1400

Service Request Summary

Folder #: **E2000179**
Client Name: ALS Environmental - US
Project Name: HS20021121
Project Number:

Report To: RJ Modashia
ALS Laboratory Group
10450 Stancliff Road
Houston, TX 77099-4338
USA
Phone Number: 281-530-5656
Cell Number:
Fax Number: 281-530-5887
E-mail: rj.modashia@alsglobal.com

Project Chemist: Corey Grandits
Originating Lab: HOUSTON
Logged By: CGRANDITS
Date Received: 02/26/20
Internal Due Date: 3/11/2020
QAP: LAB QAP
Qualifier Set: Lab Standard
Formset: Lab Standard
Merged?: Y
Report to MDL?: Y
P.O. Number: HS20021121
EDD: No EDD Specified

1 250 mL-Plastic Bottle HDPE WM CLEAR Unpreserved
Location: EHRMS-WIC 7B
Pressure Gas:

Lab Samp No.	Client Samp No	Matrix	Collected	HOUSTON ClO4 DOD/6850
E2000179-001	LH18/24-SP140_022520	Water	02/25/20 1400	**IV**

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Service Request Summary

Folder #: **E2000179**
Client Name: ALS Environmental - US
Project Name: HS20021121
Project Number:

Report To: RJ Modashia
ALS Laboratory Group
10450 Stancliff Road
Houston, TX 77099-4338
USA
Phone Number: 281-530-5656
Cell Number:
Fax Number: 281-530-5887
E-mail: rj.modashia@alsglobal.com

Project Chemist: Corey Grandits
Originating Lab: HOUSTON
Logged By: CGRANDITS
Date Received: 02/26/20
Internal Due Date: 3/11/2020
QAP: LAB QAP
Qualifier Set: Lab Standard
Formset: Lab Standard
Merged?: Y
Report to MDL?: Y
P.O. Number: HS20021121
EDD: No EDD Specified

1 250 mL-Plastic Bottle HDPE WM CLEAR Unpreserved
Location: EHRMS-WIC 7B
Pressure Gas:

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Data Qualifiers

Lab Standard

+	Possible Tedlar bag artifact.
A	TIC is a suspected aldol-condensation product
B	Analyte found in the associated method blank as well as in the sample.
BC	Reported results are not blank corrected.
BH	The back section of the tube yielded higher results than the front.
BT	Results indicated possible breakthrough; back section >=10% front section.
C	Result identification confirmed.
D	Compound identified in an analysis at a secondary dilution factor
D	Spike was diluted out
DE	Reported results are corrected for desorption efficiency.
E	Estimated value. Concentration above calibration range
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
H1	Sample analysis performed past holding time. See case narrative.
H2	Initial analysis within holding time. Reanalysis for the required dilution was past holding time.
H3	Sample was received and analyzed past holding time.
H4	Sample was extracted past required extraction holding time, but analyzed within analysis holding time. See case narrative.
I	Internal standard not within the specified limits. See case narrative.
J	Estimated Value. Concentration found below MRL.
K	A deflection in the QC ion may indicate interference with the quantitation of this ion. The concentration of this analyte should be considered as an estimate.
K	Analyte was detected above the method reporting limit prior to normalization.
L1	Laboratory control sample recovery outside the specified limits; results may be biased high.
L2	Laboratory control sample recovery outside the specified limits; results may be biased low.
L3	Laboratory control sample recovery outside the specified limits.
M	Matrix interference; results may be biased high.
M	The duplicate injection precision not met.
M1	Matrix interference due to coelution with a non-target compound; results may be biased high.
N	Presumptive evidence of a compound for TICs that have been identified based on a mass spectral library search.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.
P	Indicates chlorodiphenyl ether interference present at the retention time of the target compound.
P	Pesticide/Aroclor target analyte > 40% difference for detected concentrations between GC columns
Q	Indicates as estimated value because the P and P + 2 theoretical abundance ratio does not meet method criteria.
R	Duplicate Precision not met.
R1	Duplicate precision not within the specified limits; however, the results are below the MRL and considered estimated.
S	Surrogate recovery not within specified limits.

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Data Qualifiers

Lab Standard

S	The reported value was determined by the Method of Standard Additions (MSA).
T	Analyte is a tentatively identified compound, result is estimated.
U	Compound was analyzed for, but was not detected (ND).
V1	The continuing calibration verification standard was outside (biased high) the specified limits for this compound.
V2	The continuing calibration verification standard was outside (biased low) the specified limits for this compound.
W	Result quantified, but the corresponding peak was detected outside the generated retention time window.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
X	See case narrative.
Y	Recovery outside limits
Y	The chromatogram resembles a petroleum product but does not match the calibration standard.
Z	The chromatogram does not resemble a petroleum product.
i	The MRL/MDL has been elevated due to a matrix interference.

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Acronyms

Cal	Calibration
Conc	CONCentration
Dioxin(s)	Polychlorinated dibenzo-p-dioxin(s)
EDL	Estimated Detection Limit
EMPC	Estimated Maximum Possible Concentration
Flags	Data qualifiers
Furan(s)	Polychlorinated dibenzofuran(s)
g	Grams
ICAL	Initial CALibration
ID	IDentifier
Ions	Masses monitored for the analyte during data acquisition
L	Liter (s)
LCS	Laboratory Control Sample
DLCS	Duplicate Laboratory Control Sample
MB	Method Blank
MCL	Method Calibration Limit
MDL	Method Detection Limit
mL	Milliliters
MS	Matrix Spiked sample
DMS	Duplicate Matrix Spiked sample
NO	Number of peaks meeting all identification criteria
PCDD(s)	Polychlorinated dibenzo-p-dioxin(s)
PCDF(s)	Polychlorinated dibenzofuran(s)
ppb	Parts per billion
ppm	Parts per million
ppq	Parts per quadrillion
ppt	Parts per trillion
QA	Quality Assurance
QC	Quality Control
Ratio	Ratio of areas from monitored ions for an analyte
% Rec.	Percent recovery
RPD	Relative Percent Difference
RRF	Relative Response Factor
RT	Retention Time
SDG	Sample Delivery Group
S/N	Signal-to-noise ratio
TEF	Toxicity Equivalence Factor
TEQ	Toxicity Equivalence Quotient

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ALS Environmental

State Certifications, Accreditations, and Licenses

Agency	Number	Expire Date
Arizona Department of Health Services	AZ0793	5/27/2020
Arkansas Department of Environmental Quality	19-028-0	3/27/2020
California Department of Health Services	2919	4/30/2020
Department of Defense	A2LA 2897.01	11/30/2021
Florida Department of Health	E87611	6/30/2020
Hawaii Department of Health	TX02694	4/30/2020
Illinois Environmental Protection Agency	2000322019-2	5/9/2020
Kansas Department of Health and Environment	E-10352	7/31/2020
Louisiana Department of Environmental Quality	03087	6/30/2020
Louisiana Department of Health and Hospitals	LA028-2020	12/31/2020
Maine Center for Disease Control and Prevention	201815	6/5/2020
Maryland Department of the Environment	343	6/30/2020
Minnesota Department of Health	1785988	12/31/2020
Nebraska Department of Health and Human Services	NE-OS-25-13	4/30/2020
Nevada Department of Concervation and Natural Resources	TX026932019-1	7/31/2020
New Hampshire Environmental Laboratory Accreditation Program	209419	4/24/2020
New Jersey Department of Environmental Protection	NLC190001	6/30/2020
New York Department of Health	11707	3/31/2020
Oklahoma Department of Environmental Quality	2019-067	8/31/2020
Pennsylvania Department of Environmental Protection	68-03441-013	6/30/2020
Tennessee Department of Environment and Concervation	04016	6/30/2020
Texas Commision on Environmental Quality	TX104704231-19-25	4/30/2020
United States Department of Agriculture	P330-19-00299	10/10/2022
Utah Department of Health Environmental Laboratory Certification	TX026932019-9	7/31/2020
Washington Department of Health	C819	11/14/2020
West Virginia Department of Environmental Protection	347	6/30/2020

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Chain of Custody

ALS Environmental - Houston HRMS
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Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

E2000179 5
ALS Laboratory Group
HS20021121

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: **Colorado** **COC ID:** **13417**

SUBCONTRACT TO:

ALS Environmental
10450 Stancliff RoadSuite 210
Houston, TX 77084

Phone: +1 281 530 5656

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:	HS20021121
TSR:	Danielle Winnings

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS20021121-01**	**LH18/24-SP140_022520**	**Water**	**25 Feb 2020 14:00**
	SUB_Perch-6850			05 Mar 2020

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. MADASHIA Date/Time: 2/26/20 15:30

Received By: [illegible] Date/Time: 2/26/20 15:30

Cooler ID(s): Temperature(s):

ALS Environmental

Cooler Receipt Form

Project Chemist: IH

Client/Project: ALS-H

Thermometer ID: SM04

Date/Time Received: 2/26/20 Initials: IH

Date/Time Logged in: 2/26/20 Initials: IH

1. Method of delivery: ○ US Mail ○ Fed Ex ○ UPS ○ DHL ⊘ Courier (ALS) ○ Client

2. Samples received in: ⊘ Cooler ○ Box ○ Envelope ○ Other

3. Were custody seals on coolers? ○ Yes ⊘ No
   Were they intact? ○ Yes ○ No ⊘ N/A
   Were they signed and dated? ○ Yes ○ No ⊘ N/A
   If yes, how many and where?

4. Packing Material: ○ Inserts ⊘ Baggies ○ Bubble Wrap ○ Gel Packs ⊘ Wet Ice ○ Sleeves ○ Other

5. Foreign or Regulated Soil? ○ Yes ⊘ No Location of Sampling:

Cooler Tracking Number	COC ID	Date Opened	Time Opened	Opened By	Temp. °C	Temp Blank?
-		2/26/20	1530	IH	2.9 13.3	☒
						☐
						☐
						☐

6. Were custody papers properly filled out (ink, signed, dated, etc)? ⊘ Yes ○ No
7. Did all bottles arrive in good condition (not broken, no signs of leakage)? ⊘ Yes ○ No
8. Were all sample labels complete (i.e., sample ID, analysis, preservation, etc)? ⊘ Yes ○ No
9. Were appropriate bottles/containers and volumes received for the requested tests? ⊘ Yes ○ No
10. Did sample labels and tags agree with custody documents? ⊘ Yes ○ No

Notes, Discrepancies, & Resolutions:

Service request Label: E2000179 5
ALS Laboratory Group
HS20021121

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Effect

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Houston, TX 77099
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F: +1 713 266 1599
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SAMPLE ACCEPTANCE POLICY

This policy outlines the criteria samples must meet to be accepted by ALS Environmental – Houston HRMS.

Cooler Custody Seals (desirable, mandatory if specified in SAP):

- ✓ Intact on outside of cooler, signed and dated

Chain-of-Custody (COC) documentation (mandatory):

The following is required on each COC:

- ✓ Sample ID, the location, date and time of collection, collector's name, preservation type, sample type, and any other special remarks concerning the sampleThe COC must be completed in ink.
- ✓ Signature and date of relinquishing party.

In the absence of a COC at sample receipt, the COC will be requested from the client.

Sample Integrity (mandatory):

Samples are inspected upon arrival to ensure that sample integrity was not compromised during transfer to the laboratory.

- ✓ Sample containers must arrive in good condition (not broken or leaking).
- ✓ Samples must be labeled appropriately, including Sample IDs, and requested test using durable labels and indelible ink.
- ✓ The correct type of sample bottle must be used for the method requested.
- ✓ An appropriate sample volume, or weight, must be received.
- ✓ Sample IDs and number of containers must reconcile with the COC.
- ✓ Samples must be received within the method defined holding time.

Temperature Requirement (varies by sample matrix):

- ✓ Aqueous and Non-aqueous samples must be shipped and stored cold, at 0 to 6ºC.
- ✓ Tissue samples must be shipped and stored frozen, at -20 to -10ºC.
- ✓ Air samples are shipped and stored cold, at 0 to 6ºC
- ✓ The sample temperature must be recorded on the COC

All cooler inspections are documented on the Cooler Receipt Form (CRF). A separate CRF is completed for each service request. Any samples not meeting the above criteria are noted on the CRF and the Project Manager notified. The Project Manager must resolve any sample integrity issues with the client prior to proceeding with the analysis. Such resolutions are documented in writing and filed with the project folder. Data associated with samples received outside of this acceptance policy will be qualified on the case narrative of the final report

Preparation Information Benchsheets

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Preparation Information Benchsheet

Prep Run#: 355072 **Prep WorkFlow:** GenExt28Day **Status:** Prepped
Team: Semivoa GCMS/KBROWN **Prep Method:** Method **Prep Date/Time:** 3/10/20 10:33

#	Lab Code	Client ID	B#	Method /Test	pH	Cl	Matrix	Amt. Ext.	Sample Description
1	E2000179-001	LH18/24-SP140_022520	.01	6850/ClO4 DOD			Water	10mL	
2	E2000180-001	LH18/24-SP650_022520_BIX	.01	6850/ClO4 DOD			Water	10mL	
3	E2000181-001	LH18/24-SP650_022520_BIX	.01	6850/ClO4 DOD			Water	10mL	
4	E2000182-001	GW-MW-89D-20200226-01	.01	6850/ClO4			Ground Water	10mL	
5	E2000186-001	GW-MW-98D-20200227-01	.01	6850/ClO4			Ground Water	10mL	
6	E2000186-002	GW-MW-6602-20200227-01	.01	6850/ClO4			Ground Water	10mL	
7	E2000186-003	GW-MW-29D-20200227-01	.01	6850/ClO4			Ground Water	10mL	
8	E2000206-001	LH18/24-SP650_030420_BIX	.01	6850/ClO4 DOD			Water	10mL	
9	EQ2000089-01	MB		6850/ClO4 DOD			Liquid	10mL	
10	EQ2000089-02	LCS		6850/ClO4 DOD			Liquid	10mL	
11	EQ2000089-03	DLCS		6850/ClO4 DOD			Liquid	10mL	

Spiking Solutions

Name: Sodium Perchlorate 1 ug/mL (IS) (18-O) as CLO4 Inventory ID 202037 Logbook Ref: Sodium Perchlorate Expires On: 05/22/2021

E2000179-001	100.00µL	E2000180-001	100.00µL	E2000181-001	100.00µL	E2000182-001	100.00µL	E2000186-001	100.00µL	E2000186-002	100.00µL
E2000186-003	100.00µL	E2000206-001	100.00µL	EQ2000089-01	100.00µL	EQ2000089-01	100.00µL	EQ2000089-02	100.00µL	EQ2000089-02	100.00µL
EQ2000089-03	100.00µL	EQ2000089-03	100.00µL								

Name: Perchlorate Intermediate Stock1 Inventory ID 204799 Logbook Ref: 200657 1.0ug/mL KN Expires On: 05/15/2020

EQ2000089-02	10.00µL	EQ2000089-02	10.00µL	EQ2000089-03	10.00µL	EQ2000089-03	10.00µL

Preparation Steps

Step: Preparation
Started: 3/10/20 10:33
Finished: 3/10/20 12:00
By: KBROWN
Comments

Comments: _____

Reviewed By: KB Date: 3/10/2020

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Analytical Results

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Phone (713)266-1599 Fax (713)266-0130
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ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2000179
Project:	HS20021121	**Date Collected:**	2/25/20 1400
Sample Matrix:	Water	**Date Received:**	2/26/20
Sample Name:	LH18/24-SP140_022520	**Units:**	µg/L
Lab Code:	E2000179-001	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**10400**		100	25.0	1000	3/10/20	3/11/20 12:37	355072	673020	

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ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2000179
Project:	HS20021121	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	µg/L
Lab Code:	EQ2000089-01	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	ND	U	0.100	0.0250	1	3/10/20	3/10/20 14:25	355072	673019	

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Accuracy & Precision

ALS Environmental - Houston HRMS
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Phone (713)266-1599 Fax (713)266-0130
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ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	E2000179
Project:	HS20021121	**Date Analyzed:**	3/10/20
Sample Matrix:	Water		

Lab Control Sample Summary
Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method:	6850	**Units:**	µg/L
Prep Method:	Method	**Basis:**	NA
		Extraction Lot:	355072

	Lab Control Sample EQ2000089-02			Duplicate Lab Control Sample EQ2000089-03					
Analyte Name	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Perchlorate	1.04	1.00	104	1.13	1.00	113	84 - 119	8	15

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

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

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ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2000179
Project:	HS20021121	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Lab Control Sample	**Units:**	µg/L
Lab Code:	EQ2000089-02	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**1.04**		0.100	0.0250	1	3/10/20	3/10/20 14:33	355072	673019	

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ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	E2000179
Project:	HS20021121	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Duplicate Lab Control Sample	**Units:**	µg/L
Lab Code:	EQ2000089-03	**Basis:**	NA

Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry

Analytical Method: 6850
Prep Method: Method

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Perchlorate	**1.13**		0.100	0.0250	1	3/10/20	3/10/20 14:41	355072	673019	

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Initial Calibration

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20191230

ICAL Date: 12/30/2019
Cal. Std. xp: 5/14/2020
ICAL ID: EC2000001

1st Review: Kneir
2nd Review: Hvan

ALS Environmental
LCMS01 -Shimadzu 8050

Mobile Phases **A:** 0.75% Formic Acid/Water 3100803-09 **B:** MeOH 3100802-01

	Sample Name		File Name	Acquisition Method	Dilution	R	Comments	Date/Time
	null	null	20191230_001	Perchlorate6850b.lcm	1x	☒		12/30/2019 10:02
	null	null	20191230_002	Perchlorate6850b.lcm	1x	☒		12/30/2019 10:07
	DIBLK	DIBLK	20191230_003	Perchlorate6850b.lcm	1x	☒		12/30/2019 10:12
	DIBLK	DIBLK	20191230_004	Perchlorate6850b.lcm	1x	☒		12/30/2019 10:20
	IB	IB	20191230_005	Perchlorate6850b.lcm	1x	☒		12/30/2019 10:28
	PERCHLORATE7	PERCHLORATE7	20191230_006	Perchlorate6850b.lcm	1x	☒	3100805-02	12/30/2019 10:48
	PERCHLORATE1	PERCHLORATE1	20191230_007	Perchlorate6850b.lcm	1x	☒	3100804-05	12/30/2019 10:56
	PERCHLORATE2	PERCHLORATE2	20191230_008	Perchlorate6850b.lcm	1x	☒	3100804-06	12/30/2019 11:04
	PERCHLORATE3	PERCHLORATE3	20191230_009	Perchlorate6850b.lcm	1x	☒	3100804-07	12/30/2019 11:12
	PERCHLORATE4	PERCHLORATE4	20191230_010	Perchlorate6850b.lcm	1x	☒	3100804-08	12/30/2019 11:19
	PERCHLORATE5	PERCHLORATE5	20191230_011	Perchlorate6850b.lcm	1x	☒	3100804-09	12/30/2019 11:27
	PERCHLORATE6	PERCHLORATE6	20191230_012	Perchlorate6850b.lcm	1x	☒	3100805-01	12/30/2019 11:35
	PERCHLORATE8	PERCHLORATE8	20191230_013	Perchlorate6850b.lcm	1x	☒	3100805-03	12/30/2019 11:43
	PERCHLORATE9	PERCHLORATE9	20191230_014	Perchlorate6850b.lcm	1x	☒	3100805-04	12/30/2019 11:51
	PERCHLORATE10	PERCHLORATE10	20191230_015	Perchlorate6850b.lcm	1x	☒	3100805-05	12/30/2019 11:59
	ICV	ICV	20191230_016	Perchlorate6850b.lcm	1x	☒	3100805-06	12/30/2019 12:07
	EQ1900442-01	EQ1900442-01	20191230_017	Perchlorate6850b.lcm	1x	☒		12/30/2019 14:01
	EQ1900442-02	EQ1900442-02	20191230_018	Perchlorate6850b.lcm	1x	☒		12/30/2019 14:09
	EQ1900442-03	EQ1900442-03	20191230_019	Perchlorate6850b.lcm	1x	☒		12/30/2019 14:17
	EQ1900442-04	EQ1900442-04	20191230_020	Perchlorate6850b.lcm	1x	☒		12/30/2019 14:25
	EQ1900442-05	EQ1900442-05	20191230_021	Perchlorate6850b.lcm	1x	☒		12/30/2019 14:33
	E1900912-001	E1900912-001	20191230_022	Perchlorate6850b.lcm	1x	☒		12/30/2019 14:41
	E1900912-002	E1900912-002	20191230_023	Perchlorate6850b.lcm	1x	☒		12/30/2019 14:49
	CCV	CCV	20191230_024	Perchlorate6850b.lcm	1x	☒	3100805-02	12/30/2019 14:57
	E1900912-001X1000	E1900912-001X1000	20191230_025	Perchlorate6850b.lcm	1000	☒		12/30/2019 17:06
	E1900912-002X100	E1900912-002X100	20191230_026	Perchlorate6850b.lcm	100	☒		12/30/2019 17:14
	CCV	CCV	20191230_027	Perchlorate6850b.lcm	1x	☒	3100805-02	12/30/2019 17:22

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Initial Calibration - Detailed Report

Calibration ID: EC2000001 **Instrument ID:** E-LCMS-01
Column Name: 1

#	Lab Code	Sample Name	File Location	Aquisition Date
07	EC2000001-07	PERCHLORATE7	20191230_006	12/30/2019 10:48
01	EC2000001-01	PERCHLORATE1	20191230_007	12/30/2019 10:56
02	EC2000001-02	PERCHLORATE2	20191230_008	12/30/2019 11:04
03	EC2000001-03	PERCHLORATE3	20191230_009	12/30/2019 11:12
04	EC2000001-04	PERCHLORATE4	20191230_010	12/30/2019 11:19
05	EC2000001-05	PERCHLORATE5	20191230_011	12/30/2019 11:27
06	EC2000001-06	PERCHLORATE6	20191230_012	12/30/2019 11:35
08	EC2000001-08	PERCHLORATE8	20191230_013	12/30/2019 11:43
09	EC2000001-09	PERCHLORATE9	20191230_014	12/30/2019 11:51
10	EC2000001-10	PERCHLORATE10	20191230_015	12/30/2019 11:59

Analyte **Curve Fit** **Weighting**

Perchlorate **Average RF** **RSD = 10.79** **Average RF = 0.1352**

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.1000	0.1736	02	0.5000	0.1222	03	0.7000	0.1219	04	1.0000	0.1363
05	2.0000	0.1337	06	5.0000	0.1268	07	10.0000	0.1373	08	20.0000	0.1349
09	30.0000	0.133	10	50.0000	0.1325						

Analyte

Perchlorate

#	Amount	Calculated Conc	%D	#	Amount	Calculated Conc	%D	#	Amount	Calculated Conc	%D
01	0.1000	0.128	28.4	02	0.5000	0.452	-9.6	03	0.7000	0.631	-9.9
04	1.0000	1.01	0.8	05	2.0000	1.98	-1.1	06	5.0000	4.69	-6.2
07	10.0000	10.2	1.6	08	20.0000	20.0	-0.2	09	30.0000	29.5	-1.6
10	50.0000	49.0	-2.0								

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Initial Calibration Verification Summary Report

Calibration ID:	EC2000001	**Instrument ID:**	E-LCMS-01
Datafile ID:	20191230_016	**Column Name:**	1

Analyte	Lab Code	Type	Curve Fit	True Value	Calc Conc	Units	Result	Criteria
Perchlorate	EC2000001-11	T	Average RF	10	12.276	ng/mL	22.7	<= 25

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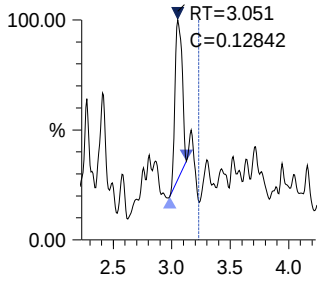
PERCHLORATE1

Date acquired: 12/30/2019 10:56:14 AM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20191230\20191230_007.lcd
Vial: 3 | Inj. Volume: 25.0000uL | Tray: 1

Name	Data Filename	Sample ID	Found RT	Area	Conc.	Acquired Date	Cal Point	Dil. Factor	Inj Vol	ISTD Area	Tray	Vial
Perchlorate	20191230_007	PERCHLORATE1	3.051	4022	0.12842	12/30/2019 10:56:14 AM	Yes	1.00000	25.0000	231680	1	3
Sodium Perchlorate-18O4_IS	20191230_007	PERCHLORATE1	3.051	231680	1.00000	12/30/2019 10:56:14 AM	No	1.00000	25.0000	231680	1	3

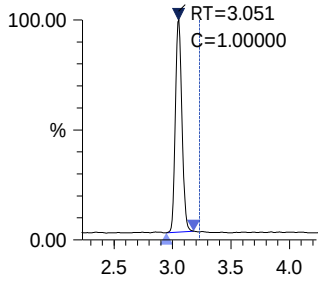
Perchlorate

Conc 0.12842
Area 4022
Q 99.00>83.00 (-) 1.27e3



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 231680
ISTD 107.00>89.00 (-) 5.94e4



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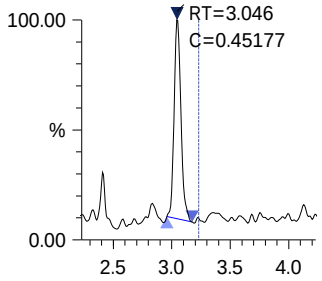
PERCHLORATE2

Date acquired: 12/30/2019 11:04:09 AM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20191230\20191230_008.lcd
Vial: 4 | Inj. Volume: 25.0000uL | Tray: 1

Name	Data Filename	Sample ID	Found RT	Area	Conc.	Acquired Date	Cal Point	Dil. Factor	Inj Vol	ISTD Area	Tray	Vial
Perchlorate	20191230_008	PERCHLORATE2	3.046	15985	0.45177	12/30/2019 11:04:09 AM	Yes	1.00000	25.0000	261704	1	4
Sodium Perchlorate-18O4_IS	20191230_008	PERCHLORATE2	3.045	261704	1.00000	12/30/2019 11:04:09 AM	No	1.00000	25.0000	261704	1	4

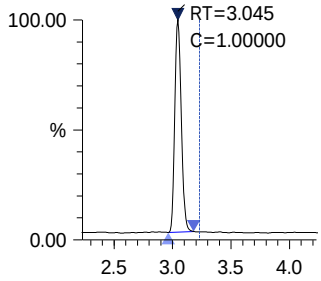
Perchlorate

Conc 0.45177
Area 15985
Q 99.00>83.00 (-) 4.21e3



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 261704
ISTD 107.00>89.00 (-) 6.75e4



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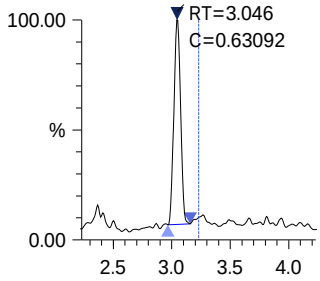
PERCHLORATE3

Date acquired: 12/30/2019 11:12:06 AM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20191230\20191230_009.lcd
Vial: 5 | Inj. Volume: 25.0000uL | Tray: 1

Name	Data Filename	Sample ID	Found RT	Area	Conc.	Acquired Date	Cal Point	Dil. Factor	Inj Vol	ISTD Area	Tray	Vial
Perchlorate	20191230_009	PERCHLORATE3	3.046	22031	0.63092	12/30/2019 11:12:06 AM	Yes	1.00000	25.0000	258274	1	5
Sodium Perchlorate-18O4_IS	20191230_009	PERCHLORATE3	3.044	258274	1.00000	12/30/2019 11:12:06 AM	No	1.00000	25.0000	258274	1	5

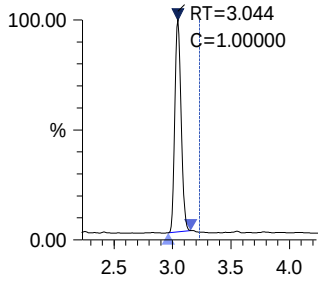
Perchlorate

Conc 0.63092
Area 22031
Q 99.00>83.00 (-) 5.75e3



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 258274
ISTD 107.00>89.00 (-) 6.88e4



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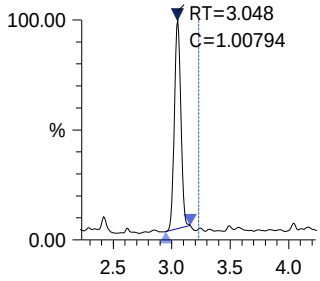
PERCHLORATE4

Date acquired: 12/30/2019 11:19:58 AM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20191230\20191230_010.lcd
Vial: 6 | Inj. Volume: 25.0000uL | Tray: 1

Name	Data Filename	Sample ID	Found RT	Area	Conc.	Acquired Date	Cal Point	Dil. Factor	Inj Vol	ISTD Area	Tray	Vial
Perchlorate	20191230_010	PERCHLORATE4	3.048	36488	1.00794	12/30/2019 11:19:58 AM	Yes	1.00000	25.0000	267754	1	6
Sodium Perchlorate-18O4_IS	20191230_010	PERCHLORATE4	3.046	267754	1.00000	12/30/2019 11:19:58 AM	No	1.00000	25.0000	267754	1	6

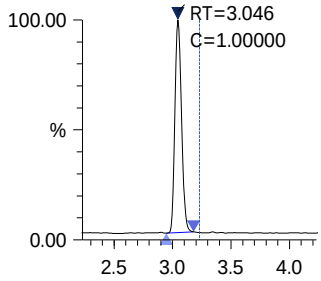
Perchlorate

Conc 1.00794
Area 36488
Q 99.00>83.00 (-) 9.73e3



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 267754
ISTD 107.00>89.00 (-) 6.78e4



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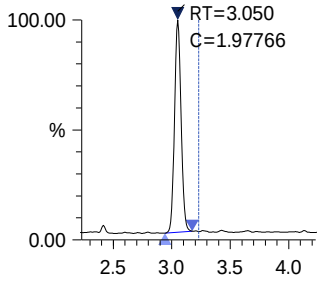
PERCHLORATE5

Date acquired: 12/30/2019 11:27:53 AM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20191230\20191230_011.lcd
Vial: 7 | Inj. Volume: 25.0000uL | Tray: 1

Name	Data Filename	Sample ID	Found RT	Area	Conc.	Acquired Date	Cal Point	Dil. Factor	Inj Vol	ISTD Area	Tray	Vial
Perchlorate	20191230_011	PERCHLORATE5	3.050	74631	1.97766	12/30/2019 11:27:53 AM	Yes	1.00000	25.0000	279118	1	7
Sodium Perchlorate-18O4_IS	20191230_011	PERCHLORATE5	3.046	279118	1.00000	12/30/2019 11:27:53 AM	No	1.00000	25.0000	279118	1	7

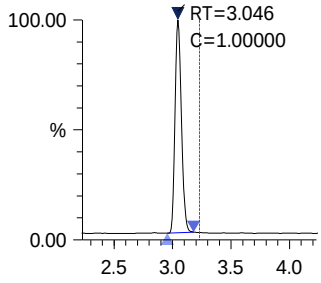
Perchlorate

Conc 1.97766
Area 74631
Q 99.00>83.00 (-) 1.92e4



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 279118
ISTD 107.00>89.00 (-) 7.33e4



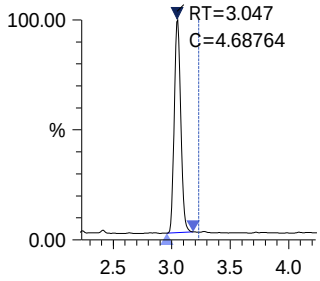
PERCHLORATE6

Date acquired: 12/30/2019 11:35:50 AM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20191230\20191230_012.lcd
Vial: 8 | Inj. Volume: 25.0000uL | Tray: 1

Name	Data Filename	Sample ID	Found RT	Area	Conc.	Acquired Date	Cal Point	Dil. Factor	Inj Vol	ISTD Area	Tray	Vial
Perchlorate	20191230_012	PERCHLORATE6	3.047	159122	4.68764	12/30/2019 11:35:50 AM	Yes	1.00000	25.0000	251072	1	8
Sodium Perchlorate-18O4_IS	20191230_012	PERCHLORATE6	3.045	251072	1.00000	12/30/2019 11:35:50 AM	No	1.00000	25.0000	251072	1	8

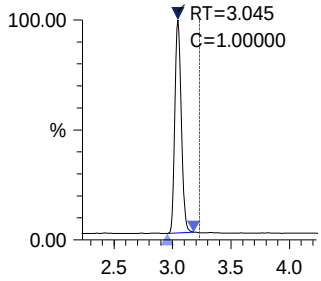
Perchlorate

Conc 4.68764
Area 159122
Q 99.00>83.00 (-) 4.12e4



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 251072
ISTD 107.00>89.00 (-) 6.53e4



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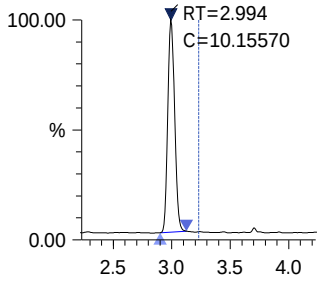
PERCHLORATE7

Date acquired: 12/30/2019 10:48:20 AM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20191230\20191230_006.lcd
Vial: 9 | Inj. Volume: 25.0000uL | Tray: 1

Name	Data Filename	Sample ID	Found RT	Area	Conc.	Acquired Date	Cal Point	Dil. Factor	Inj Vol	ISTD Area	Tray	Vial
Perchlorate	20191230_006	PERCHLORATE7	2.994	298821	10.15570	12/30/2019 10:48:20 AM	Yes	1.00000	25.0000	217632	1	9
Sodium Perchlorate-18O4_IS	20191230_006	PERCHLORATE7	2.991	217632	1.00000	12/30/2019 10:48:20 AM	No	1.00000	25.0000	217632	1	9

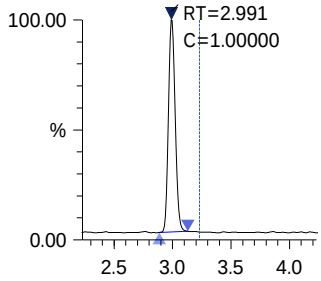
Perchlorate

Conc 10.15570
Area 298821
Q 99.00>83.00 (-) 7.46e4



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 217632
ISTD 107.00>89.00 (-) 5.38e4



PERCHLORATE8

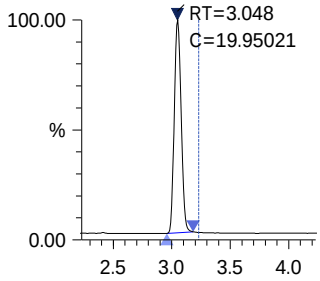
Date acquired: 12/30/2019 11:43:47 AM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20191230\20191230_013.lcd
Vial: 10 | Inj. Volume: 25.0000uL | Tray: 1

Name	Data Filename	Sample ID	Found RT	Area	Conc.	Acquired Date	Cal Point	Dil. Factor	Inj Vol	ISTD Area	Tray	Vial
Perchlorate	20191230_013	PERCHLORATE8	3.048	557358	19.95021	12/30/2019 11:43:47 AM	Yes	1.00000	25.0000	206636	1	10
Sodium Perchlorate-18O4_IS	20191230_013	PERCHLORATE8	3.045	206636	1.00000	12/30/2019 11:43:47 AM	No	1.00000	25.0000	206636	1	10

Perchlorate

Conc 19.95021
Area 557358

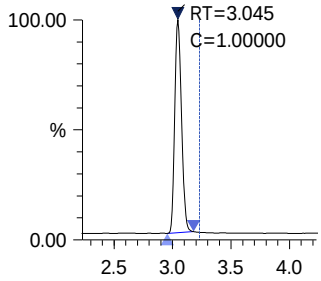
Q 99.00>83.00 (-) 1.37e5



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 206636

ISTD 107.00>89.00 (-) 5.11e4



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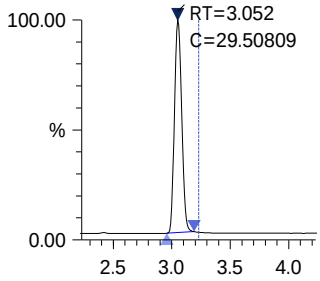
PERCHLORATE9

Date acquired: 12/30/2019 11:51:43 AM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20191230\20191230_014.lcd
Vial: 11 | Inj. Volume: 25.0000uL | Tray: 1

Name	Data Filename	Sample ID	Found RT	Area	Conc.	Acquired Date	Cal Point	Dil. Factor	Inj Vol	ISTD Area	Tray	Vial
Perchlorate	20191230_014	PERCHLORATE9	3.052	730647	29.50809	12/30/2019 11:51:43 AM	Yes	1.00000	25.0000	183142	1	11
Sodium Perchlorate-18O4_IS	20191230_014	PERCHLORATE9	3.049	183142	1.00000	12/30/2019 11:51:43 AM	No	1.00000	25.0000	183142	1	11

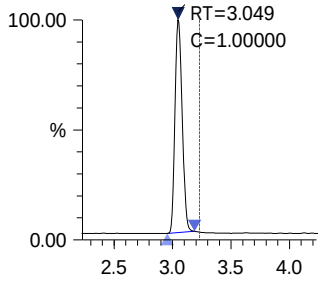
Perchlorate

Conc 29.50809
Area 730647
Q 99.00>83.00 (-) 1.70e5



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 183142
ISTD 107.00>89.00 (-) 4.27e4



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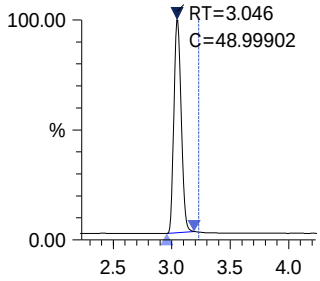
PERCHLORATE10

Date acquired: 12/30/2019 11:59:38 AM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20191230\20191230_015.lcd
Vial: 12 | Inj. Volume: 25.0000uL | Tray: 1

Name	Data Filename	Sample ID	Found RT	Area	Conc.	Acquired Date	Cal Point	Dil. Factor	Inj Vol	ISTD Area	Tray	Vial
Perchlorate	20191230_015	PERCHLORATE10	3.046	1090166	48.99902	12/30/2019 11:59:38 AM	Yes	1.00000	25.0000	164560	1	12
Sodium Perchlorate-18O4_IS	20191230_015	PERCHLORATE10	3.043	164560	1.00000	12/30/2019 11:59:38 AM	No	1.00000	25.0000	164560	1	12

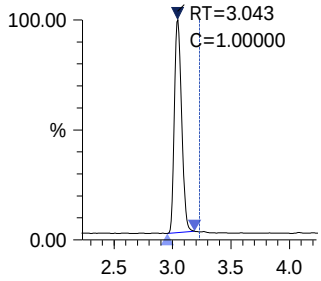
Perchlorate

Conc 48.99902
Area 1090166
Q 99.00>83.00 (-) 2.51e5



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 164560
ISTD 107.00>89.00 (-) 3.80e4



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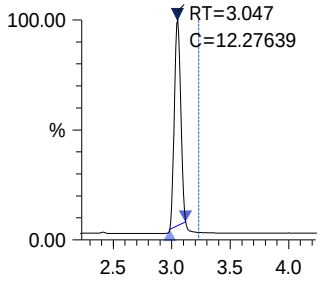
ICV

Date acquired: 12/30/2019 12:07:32 PM
Acquired by: System Administrator
Data File: I:\LCMS01\DATA\20191230\20191230_016.lcd
Vial: 13 | Inj. Volume: 25.0000uL | Tray: 1

Name	Data Filename	Sample ID	Found RT	Area	Conc.	Acquired Date	Cal Point	Dil. Factor	Inj Vol	ISTD Area	Tray	Vial
Perchlorate	20191230_016	ICV	3.047	347932	12.27639	12/30/2019 12:07:32 PM	No	1.00000	25.0000	209626	1	13
Sodium Perchlorate-18O4_IS	20191230_016	ICV	3.045	209626	1.00000	12/30/2019 12:07:32 PM	No	1.00000	25.0000	209626	1	13

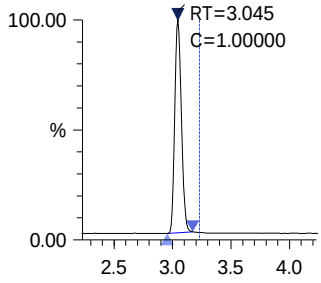
Perchlorate

Conc 12.27639
Area 347932
Q 99.00>83.00 (-) 9.49e4



Sodium Perchlorate-18O4_IS

Conc 1.00000
Area 209626
ISTD 107.00>89.00 (-) 5.28e4



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Chromatograms and Selected Ion Monitoring

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